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## MEAD'S BUTTERFLIES IN COLORADO, 1871

by James A. Scott, Ph.D. in entomology, University of California Berkeley, 1972  
(e-mail: [JameScott@juno.com](mailto:JameScott@juno.com))

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### Introduction

Theodore L. Mead (1852-1936) visited central Colorado from June to September 1871 to collect butterflies. Considerable effort has been spent trying to determine the identities of the butterflies he collected for his future father-in-law William Henry Edwards, and where he collected them. Brown (1956) tried to deduce his itinerary based on the specimens and the few letters etc. available to him then. Brown (1964-1987) designated lectotypes and neotypes for the names of the butterflies that William Henry Edwards described, including 24 based on Mead's specimens. Brown & Brown (1996) published many later-discovered letters written by Mead describing his travels and collections. Calhoun (2013) purchased Mead's journal and published Mead's brief journal descriptions of his collecting efforts and his travels by stage and horseback and walking, and Calhoun commented on some of the butterflies he collected (especially lectotypes). Calhoun (2015a) published an abbreviated summary of Mead's travels using those improved locations from the journal etc., and detailed the type localities of some of the butterflies named from Mead specimens.

Unfortunately, the data published to date is a mess, because bits and pieces were published here and there, but the whole has not been systematically collected and organized and fully analyzed.

The journal contains good information about locations and travels, but has little information about the butterflies found. Mead (1876) has much information about the butterflies, but some information is wrong based on other sources, and specimens taken by the Wheeler “Expedition” are sometimes confused with Mead’s. The letters contain much information regarding the butterflies, but require the other sources to deduce the dates and localities Mead wrote about in those letters. Calhoun (2015a) corrected most of Mead’s travels, but lists few butterflies, mostly concentrating on the lectotypes. Even Mead’s own counts of butterflies collected are a mess, as Mead (1877) lists a total of 3925 butterflies collected (1792 in June, 1483 in July, 607 in August, 43 in September, 1871) including many counts of butterfly subfamilies or generic groupings and several species, but all of those counts that can be directly compared with counts in Mead (1876) or other sources are different (such as 16 or 17 *Pyrgus centaureae*, 62 or 70 *Erebia callias*), including the grand total of ~3000 by another count.

To organize that mess, I computerized all the information from every available source of data, combined all that data into an organized whole, fixed discrepancies and contradictions, and used that to produce several useful products: The first product is a taxonomic list of all the butterflies Mead collected (or saw), listing localities and dates of specimens he collected and all other relevant data such as Mead’s field names for each butterfly species, and his rearing attempts for each species. The type localities of all the names based on Mead specimens are again analyzed in that section, by relentlessly applying ICZN-Code articles without guessing, to improve many of those type localities. The second product is a chronological diary of the localities visited and butterflies collected each day or group of days. Summaries are also given of the butterflies collected at each major locality. I also compiled a list of all the “field names” that Mead gave each species when he collected them, matched with the scientific names we now use, because on his trip Mead had no access to the scientific names or publications available for Colorado butterflies, so he invented short names and numbers for them.

Gathering and properly organizing that data has produced various new discoveries and corrected many errors and has solved numerous contradictions and problems. It’s like building a car out of pieces in a junkyard; when you try to put the car together, you quickly see which parts do not mesh and must be ignored, and then as you find the right pieces and join them the proper way it finally works. Instant computer search access to all the information concerning every aspect has enabled me to solve those problems (adjust the localities visited on each date, fix the species identities, etc.) and reconcile differences and discrepancies and instantly fix problems throughout the system, producing numerous improvements. For instance, Mead was bitten by a horsefly one day, and tracking that bite through the journal and letters revealed the exact location of one butterfly collecting site. By tracking his collections through time, the identity of species he reported as “new” could be determined. I could track his rearings through time. The field names he used could be carefully studied. I also used USGS topographic maps and careful study of his journal descriptions (including travel times and mileages) to locate Mead’s travels and correct a dozen former locations of his collecting. I used the historic trail maps of Colorado produced by my father Glenn R. Scott for most of Colorado (including all areas of Mead’s travels) to interpret Mead’s travels (Glenn Scott 1975, 1999, 2004a, 2004b, Glenn Scott et al. 2008). I used my knowledge of the larvae of Colorado butterflies to identify some of his unknown larvae. I used my 56 years’ experience (1959 to 2015) studying the habitats and abundances and flight times etc. of Colorado butterflies, to interpret Mead’s butterfly names and locations and flight times. Mead’s misidentifications could be more clearly understood, allowing modern names to be applied to his taxa. Mistakes could be found and fixed. Mismatches were found between butterflies and localities, and butterflies and dates--some butterflies do not occur at the locality deduced from Mead’s month and day that he wrote on his specimen envelopes, or do not fly at the time his month

and day claims or the time previous authors claimed. Those mismatches include misidentifications, plus some specimens that were apparently misfiled into the wrong envelope by W. H. Edwards or mis-dated by Mead. As a result of melding this computer analysis with history, topography, and butterfly biology, I have been able to correct or improve the locations of some of Mead's collection sites (for about a dozen days) and type localities listed by Calhoun (2015a), improve the identifications of some of the questionable species, and even add several new species to the list of butterflies that he collected.

The current study will form a solid foundation onto which can be added the last major potential improvement: a detailed listing of all the Mead 1871 specimens in museums that contain month and date on the labels. I list many museum specimens below, based on photos in museum archives and the [butterfliesofamerica.com](http://butterfliesofamerica.com) website, plus specimens listed by Brown (1964-1987) in his text for the 24 names Edwards described based on Mead 1871 specimens, and specimens listed by Calhoun (2015a), various other papers, etc. But there are more specimens in many museums that have useful information that should be added to this study. Mead's collection in Carnegie Museum Natural History=CMNH in particular has specimens that should be added, because many of his Colorado specimens evidently still have month and date of collection; many of those specimens are in poor condition. Herbert K. Morrison received some specimens from Mead with dates that allowed Morrison to put exact localities on the labels (Calhoun 2015a p. 7) that are now in many museums including the Smithsonian and Peabody Museum. Edwards exchanged or sold most of Mead's specimens that he kept. Expert identification of those museum specimens will help clarify some names, because some species are difficult to identify.

Unfortunately, Mead wrote only month and date in numbers on his paper triangle envelopes, usually written in brown ink, sometimes black or dark-blue ink or pencil (there is disagreement about the colors and ink or pencil etc. and many have faded)—he almost never wrote the locality. And unfortunately Mead mailed nearly all of them to William Henry Edwards, who was a data-discarding machine (Table 1): when Edwards mounted a specimen he threw away Mead's triangular envelopes that contained Mead's month and day on the paper triangle, and did not write that information or the locality on the specimen label. W. H. Edwards cared little about localities, he just wanted to find and describe new species, and his species were based on phenotype, not locality {his *Hesperia comma oregonia* (W. Edwards) for instance included specimens from numerous locations that had a tawnier ventral hindwing chevron, Brown 1964-1987 103:292}. So as Edwards worked on them, he took them out of the envelopes and identified and sorted them and placed them in single-species envelopes and into larger letter-size envelopes (Calhoun 2015a), and some became mislabeled during that process. As he received more specimens, he would open the new and old envelopes and continue the sorting. Because Edwards did not care about the month and day information Mead wrote on the triangular envelopes, it appears that after opening the envelopes and sorting the butterflies to species, Edwards would sometimes place specimens back into the wrong envelopes—envelopes with a different date of collection—causing the locality we now deduce from those dates to be wrong. Many specimens were kept and mounted by Edwards, who threw away the month and date when he mounted them, then the next year Feb. 28-April 30 1872 Edwards returned many specimens in paper triangles to Mead with Mead's month-day written on them, and some of those were in the wrong envelopes misplaced by Edwards. Edwards and Mead then gave some specimens to ~15 other people (including Samuel H. Scudder, who got some of Mead's specimens from Edwards, Mead, and Herbert K. Morrison, and got many papered and some mounted *Hesperiinae* from Edwards in Dec. 1873) (Calhoun 2015a, pp. 6, 22). Thus nearly all of Mead's specimens were unfortunately subjected to Edwards' system which disdained localities, except for some specimens Mead gave to four San Francisco collectors when he went through San Francisco in October-early November 1871 (Henry Edwards, James Behrens, Herman H. Behr, and R. H.

Stretch, especially the first two). Samuel Scudder received some Mead specimens of Hesperinae in paper envelopes (the Hesperinae specimens evidently only from Edwards, as Calhoun (2015a p. 6) wrote that Mead mounted all of his Hesperinae specimens) and evidently clipped off that portion of the triangle that had Mead's month and day information and placed that clipping on the pin under the specimen. Much later, the Edwards and Mead collections were bought separately by William J. Holland (Holland bought Edwards' collection for \$2500 in 1885-1886, and bought Mead's collection—containing many specimens in neglected poor condition—for \$460 in 1884, Calhoun 2015a), who mounted Mead's specimens that were still in paper triangles and also clipped off that portion of the triangle that had Mead's month and day information and placed that clipping on the pin under the specimen. Still later (after some molded in his cellar), Holland deposited Edwards' and Mead's collections in the Carnegie Museum of Natural History=CMNH where Holland served as director. Table 1 shows how Edwards just threw away the data, so the Mead specimens in Edwards' collection generally have just "Colo" with no date, or have no locality and date at all so are worthless. Mead hand-wrote labels for his mounted specimens (letter 183) and wrote month and day on those labels, but he did not write the locality on most of his mounted specimens either! And the people who got specimens from Mead generally did not list the locality either and did not bother to ask Mead to look up the locality using the month/day information. Thus, there may be only a few hundred specimens available in museums that have month and day information that could be used to look up the exact locality, and thus contribute to the data presented in this paper. People should find those specimens and look up the locality, and add them to the specimens listed below. Those new specimens would contribute to the localities known for Mead's butterflies, and we would find a few more of Mead's field names, and would find more mislabeled specimens. Herbert Knowles Morrison's specimens often have localities and dates, that he evidently got from Mead, so those specimens offer good information also.

Type localities of names based on Mead specimens. The ICZN Code does not permit scientific progress to be used in the definition and naming of species. It requires that each species' name be based on the oldest described and named specimen, even if that specimen lacks locality and date and/or is unidentifiable. The Code states that the TL is the locality of that name-bearing type, either holotype, lectotype, or neotype, or if none of those were designated, the collective locality of all the syntypes. "Restriction of type locality" does not exist in the Code, thus people can argue as much as they want about the TL, but the TL must be the best scientifically-correct determination of the locality where the name-bearing type was collected, and all other guesses of the TL that are claimed to be "type locality restriction" are not sanctioned by the Code so are not binding and can just be ignored. So we must carefully distinguish between two words here: "deduction", and "guessing". Deduction is scientifically proper to deduce the locality of the name-bearing type; whereas guesses that arbitrarily "restrict the type locality" without reason are worthless. So if there is no good evidence to deduce the original locality of the name-bearing type, all guesses must be ignored, and the type locality must just be stated to be the broad area where ALL the syntypes or paralectotypes came from, because in that case the "name-bearing type" defined by the ICZN Code constitutes all the syntypes or paralectotypes. Specifically, if there is a designated holotype, lectotype, or neotype or group of syntypes which lacks adequate locality data, and no good evidence to deduce the type locality from the original description or other publications or sources, the type locality is the collective localities of all the types (including syntypes, paralectotypes, paratypes, etc.), and the only way to get a type with usefully-restricted-locality data is to get a petition for a new neotype published and approved by the ICZN. These ICZN principles are relentlessly followed below, so factless guessing is removed from the process of determining deduced type localities.

Some people will be disappointed that type locality restrictions based on unsupported guesswork are demoted here, but this is the Old Name Sewer, which is ruled not by science, but by the

Principle of Priority and the often-worthless (even misleading or wrong or deliberately mislabeled) data on ancient bad types. Because the ICZN gives priority to old bad work instead of new good work, they force us to dredge up old bad work and forever suffer the problems caused by that work.

Another problem is that a lectotype must be designated from syntypes, and unfortunately Edwards was a data-discarding machine (Table 1) who just threw away Mead's month and day data on the envelopes that could have been used to look up the locality, so as a result most of Edwards' specimens have no usable data, and then Brown came along and designated (for curatorial convenience only) hundreds of lectotypes from Edwards' worthless specimens, and designated few from Mead collection specimens that still had month and date (though Mead seldom put locality on his specimens either!). Actually Edwards examined and identified nearly ALL of Mead's specimens before returning many to Mead, so Mead's specimens were syntypes of Edwards' names, therefore **BROWN MADE A HORRIBLE MISTAKE** by mainly using Edwards' no-date-no locality specimens for lectotypes instead of Mead's. The result was worthless lectotypes without data, making people guess as to the type locality, and then their guesses are not binding because "type locality restriction" does not exist in the ICZN Code. (This again emphasizes that the ICZN should only allow lectotypes to be designated during taxonomic revisions, not during routine curatorial work as Brown did.) The Code does require that neotypes must be designated only during taxonomic revisions of a group, not just for curatorial convenience, which means that the several neotypes that Brown designated to replace lost Mead types, are all invalid. Thus the Principle of Priority and the ICZN Code conspire to prevent proper taxonomy.

Note that Edwards (Trans. Amer. Ent. Soc. 3:273, 1871) wrote about *Plebejus icarioides lycea* types, "Taken in Colorado by Mr. Mead.", which is a gross mistake as *lycea* was named in 1864, and Brown (1964-1987 96:395) says that the original collector was probably William S. Wood Jr. This illustrates how careless Edwards was, as he discarded specimen data, mislabeled specimens, named the same species multiple times, defined his species by individual phenotype rather than population phenotype, forgot localities, etc. It shows that sometimes we should not believe Edwards' statements about the origin of his named species.

Future revisions. I sent an earlier version of this paper to John Calhoun on Sept. 29, 2015 suggesting we collaborate, because he knows of more museum specimens with Mead's dates of capture that can be used to look up their localities. He did not reply. So, such new localities will probably appear in little bits in numerous little blurbs in coming years, and then I will have to publish an update of this paper adding those specimens and improvements and correcting whatever mistakes are made in those little bits. Visitors to the Carnegie Museum of Natural History may be able to find more specimens especially in the Mead Collection, where the curator John Rawlins placed a printed Sept. 2015 version of this paper (the present version is better of course). Calhoun can use the current paper to revise and improve his Calhoun (2013) paper which is full of mistakes.

Abbreviations: O.D.=original description. Extra labels on specimens other than those disclosing locality date and collector are not detailed below.

**TABLE 1.** Presence or absence of month and day on labels of name-bearing types collected by Theodore L. Mead in 1871, based mostly on types determined and designated by Brown (1964-1987) in Transactions of the American Entomological Society (TAES: volume and page numbers listed below). William J. Holland bought the collections of both W. H. Edwards and T. L. Mead and deposited them in Carnegie Museum of Natural History=CMNH. \*Original holotype of this one name now lost. \*\*These four names were named by other persons (the other majority were named by W. H. Edwards). \*\*\*Probably collected by Mead in 1871. HT=holotype, LT=lectotype, NT=neotype. Original spellings of names are used, including *Anthocaris* and *Thymeticus* that were misspelled.

	month & day PRESENT on labels of name-bearing type	month & day ABSENT on labels of name-bearing type.	totals
William Henry Edwards collection	None!	<i>Anthocaris julia</i> Edwards, 1872 (LT, TAES 99:43-45) <i>Colias meadii</i> Edwards, 1871 (LT, TAES 99:91-93) <i>Erebia callias</i> Edwards, 1871 (LT, TAES 90:406-408) <i>Erebia meadii</i> Edwards, 1872 (LT, TAES 90:370-372) <i>Satyrus charon</i> Edwards, 1872 (LT, TAES 90:366-368) <i>Argynnis meadii</i> Edwards, 1872 (LT, TAES 91:284-285) <i>Argynnis electa</i> Edwards, 1878 (LT, TAES 91:306-310) <i>Argynnis eurynome</i> Edwards, 1872 (LT, TAES 91:327-330) <i>Argynnis helena</i> Edwards, 1871 (LT, TAES 91:342-344) <i>Lycaena daunia</i> Edwards, 1871 (HT, TAES 96:412-413) <i>Thymeticus hylax</i> Edwards, 1871 (LT, TAES 103:268-269) <i>Pamphila draco</i> Edwards, 1871 (LT, TAES 106:48-49) <i>Hesperia dacotah</i> Edwards, 1871 (HT, TAES 106:52-53) <i>Hesperia napa</i> Edwards, 1865 (NT, TAES 106:71-72) <i>*Lycaena alce</i> Edwards, 1871 holotype was in W. H. Edwards collection (Brown NT TAES 96:362-365 p. 364) named in original description "From Colorado, taken by Mr. Mead" that evidently also lacked date because no one ever reported its exact date, but that holotype is lost so its labels cannot be examined. <i>**Anthocaris coloradensis</i> Henry Edwards, 1881 lectotype is a Mead 1871 male without data in the Henry Edwards collection in AMNH designated lectotype by K. Johnson, which may have come from W. H. Edwards (Calhoun 2015a p. 23-24) <i>**Melitaea calydon</i> W. J. Holland, 1931 syntype male and female in the W. H. Edwards collection also lack dates and labeled localities (Calhoun 2015a p. 30) <i>***Argynnis hesperis</i> Edwards, 1864 (NT, TAES 91:298-301) probably coll. by Mead in 1871 but Edwards threw away the proof.	18
	PRESENT		
	ABSENT		
Theodore Luqueer Mead collection	<i>Colias hagenii</i> Edwards, 1884 (LT, TAES 90:87-90) (Calhoun 2015a p. 24 proved <i>hagenii</i> came from Mead coll.) <i>Erebia rhodia</i> Edwards, 1871 (LT, TAES 90:404-406) <i>Phyciodes camillus</i> Edwards, 1871 (LT, TAES 92:451-453) <i>Phyciodes emissa</i> Edwards, 1871 (LT, TAES 92:453-455) <i>Phyciodes drusus</i> Edwards, 1884 (LT, TAES 92:400-402) <i>Grapta hylas</i> Edwards, 1872 (LT, TAES 93:339-341) <i>Chrysophanus sirius</i> Edwards, 1871 (LT, TAES 95:166-169) <i>Lycaena melissa</i> Edwards, 1873 (LT, TAES 96:372-375) <i>**Pamphila nevada</i> Scudder, 1874 LT male MCZ has Mead's handwritten dated label (MCZ photo) and was mounted & labeled by Mead then given to Samuel H. Scudder. <i>**Euphydryas anicia eurytion</i> Holland, 1931 not Mead, 1876 LT male designated by Calhoun (2015a) has a piece of original envelope with month and date and a label "Collection T. L. Mead" (Calhoun 2015a p. 26-29, fig. 18).	<i>Thecla ninus</i> Edwards, 1871 (LT, TAES 96:57-59)	11
totals	10	19	29

## **Locations of Localities Mentioned Below (near major roads or towns, and counties etc.)**

Alma 10578', hwy 9 ~7 mi. NW Fairplay, Park Co. Colo.

Apex Gulch ~6300-7000', Jefferson Co. Colo., a gulch ~1 mile S of Golden W of U.S. 40 that had an old dirt road going up to the pediment [a late-Eocene surface that my father Glenn R. Scott demonstrated to occur all over the eastern Mts. of Colorado south to the Wet Mts.] on top of Lookout Mtn.

Argentine Pass 13207', Clear Creek/Summit Cos. Colo., 2 miles ESE of Gray's Peak, SW of Georgetown, Colo.

Bailey 7739', U.S. 285, North Fork of the South Platte River, Park Co. Colo. The small towns of Shawnee ~8100', Grant 8606', and Webster ~9,000' are farther west on that river along US 285 toward Kenosha Pass.

Beaver Creek, 10000'+, Park Co. Colo., intermittent creek starting just N of Fairplay which drains off alpine continental divide including Mt. Silverheels then flows south to just north of Fairplay then just SE of Fairplay where it joins the South Platte River.

Berthoud Pass 11307', US40, Clear Creek/Grand Cos. Colo.

Blue River, river between Dillon and Kremmling in Summit & Grand Cos. Colo.

Bradford Junction 8060', Jefferson Co. Colo., is a small old stage-stop hotel where Mead spent nights. It was between the currently-mapped towns of Aspen Park [actually part of Conifer] and Conifer, on SE corner of CR73 (the old Mt. Vernon "Stage Road) and a road at SW corner of current Aspen Park (just SE of base of Shadow Mtn. Drive that goes W up North Turkey Creek). Mead often walked NE ½ mile where South Turkey Creek starts (along current U.S. 285) and then walked down into South Turkey Creek Canyon along the Denver to South Park Wagon Road. This "Bradford Junction" location is useful to describe his travels to and from. However, "Turkey Creek" is a perfectly good name to apply to the localities of the butterflies taken, because North Turkey Creek runs right past the House from south to north, and ½ mile to the east is the start of South Turkey Creek (Conifer 7.5 minute topographic map). Therefore the Bradford Junction hotel is between the headwaters of North and South Turkey Creeks, so Mead's "Turkey Creek Junction" is a perfectly good name. His "7500 ft." generally referred to this Turkey Creek locality of several creeks.

California Gulch, <10000-10600', a nearly-nonexistent gully on an alluvial fan along U.S. 24 from the Arkansas River along the S edge of Leadville then ESE as an actual valley into the hills about 3 miles past [new] Oro City, Lake Co. Colo.

Canon City 5332', town on Arkansas River just E of the Royal Gorge on US50, Fremont Co. Colo.

Colorado City 6200', now on US24 at W side Colorado Springs, El Paso Co. Colo.

Currant Creek, along highway 9 in southern Park and northern Fremont Cos. Colo.

Dayton=Twin Lakes ~9220' is the old name of small town just NW of upper (western) Twin Lake, Lake Co. Colo. The current tiny town of Twin Lakes is very near that site.

Dillon 9000', town along I-70 now under Dillon Reservoir, near Silverthorne, Summit Co. Colo.

Fairplay, 9953', Park Co. Colo.—town at NW corner of the flat South Park.

Florissant 8172', US24, in South Park in western Teller Co. Colo., with shale fossils.

Fraser 8574', US40 in "Middle Park", Grand Co. Colo.

Georgetown 8530', Clear Creek Co. Colo., on Clear Creek along I-70 far west of Denver.

Grant 8606', on US 285 ~11.5 road miles W Bailey, Park Co. Colo.

Hamilton ~10000', ghost town on Tarryall Creek ~1.9 mi. NW of Como, ~2.3 miles NW of US285xHwy10, Park Co. Colo.

Hartsel 8864', hwy. 9xUS24 in SW Park Co. Colo.  
 Hoosier Creek, Park Co. Colo., creek draining E to Kenosha House then NE to Webster, Park Co. Colo.  
 Hot Sulphur Springs 7680', US40 along Colorado River (originally "Grand" River), Grand Co. Colo.  
 Idaho Springs 7540', Clear Creek Co. Colo., along I-70 west of Denver.  
 Kenosha House 9700' [small old hotel now gone], 1.5 road mi. N Kenosha Pass 9997' on SE side of valley across from Hoosier Creek valley, Park Co. Colo. (Calhoun 2015a improved the location of this site a little).  
 Kremmling, 7364', US40xHwy. 9 along Colorado River (originally "Grand" River), Grand Co. Colo.  
 Leadville 10152', mostly north of and along California Gulch in NE Lake Co. Colo.  
 "Middle Park" does not actually exist because it is mostly forest, but is considered to be the lowlands in Grand Co. Colo. from Fraser to Granby.  
 Montgomery—ghost town now at the bottom of Montgomery Reservoir, just SW of Hoosier Pass, in NW Park Co. Colo.  
 Mosquito Pass ~13050', in Mosquito Range (Mead's "Snowy Range") Park/Lake Cos. Colo.  
 Mt. Lincoln 14286', an alpine mountain SW of Montgomery and Hoosier Pass, in NW Park Co. Colo.  
 Oro City 10600' [new Oro City 2 mi. SE Leadville along California Gulch, just SE Iron Hill—the old Oro City at SE corner of current Leadville was founded 1860 and mostly abandoned 1864 (Glenn Scott 2004a)], a cluster of buildings/houses on California Culch, Lake Co. Colo.  
 Pueblo 4684', on US50 on Arkansas River, Pueblo Co. Colo.  
 Shawnee ~8100' (Slaght's House in 1871), on US 285 about 5 mi. W Bailey, Park Co. Colo.  
 Turkey Creek or Turkey Creek Junction 8060', Mead's butterfly locality in Jefferson Co. Colo., around Bradford Junction. Mead usually called this area "7500" because he mostly collected down South Turkey Creek to the east, or partly because he got the altitude a little wrong. "Turkey Creek Junction" is a perfectly valid name for the area around Bradford Junction because the headwaters of North Turkey Creek ran S to N just across the road W of the hotel and the start of South Turkey Creek was just ½ mile NE over a slight rise where Mead often went down South Turkey Creek Canyon. Thus "Bradford Junction" is the near-meeting point of North and South Turkey Creeks, so Turkey Creek Junction is a good name for it.  
 Twin Lakes 9210', Lake Co. Colo., two lakes on Lake Creek now enlarged from originals into Twin Lakes Reservoir. Mead stayed in Mr. Derry's house just E of the eastern lake.  
 Webster ~9,000', on US 285 ~4.5 road miles N of Kenosha Pass, at the base of Hall Valley, Park Co. Colo.

### Summary of Butterflies Collected at Mead's Major Localities

These summaries were compiled from all sources including specimens in museums, etc. The day-to-day records are detailed in Mead's butterfly diary below.

**Denver butterflies** (June 1 & 3, Denver, Colorado). *Pholisora catullus*, *Pyrgus communis*?, *Pontia protodice* 9 specimens, *Neominois ridingsii*, *Aglaia milberti* many larvae, *Argynnis edwardsii*, *Vanessa atalanta*?, *Poladryas minuta arachne* one, *Chlosyne gorgone*, *Phyciodes pulchella camillus* (& lectotype *emissa*), *Lycaena helloides*, *Celastrina humulus*, *Plebejus melissa*, *Plebejus lupini texanus*?, *Plebejus icarioides*, *Hemileuca nevadensis*=*"Saturnia maia"* larvae on willow [*Salix* probably *exigua*] & cottonwood [*Populus deltoides monilifera*].



**South Turkey Creek butterflies** (walking ENE to South Turkey Creek, June 5-7, 21, 23, 24, 27, July 29, Jefferson County Colorado). *Erynnis persius* one, *Hesperia nevada nevada* 1m, *Polites themistocles*? 1m1f, *Polites mystic dacotah* holotype, *Parnassius phoebus smintheus* + 53m1f + egg + 2 eggshells, *Papilio indra* one, *Papilio glaucus rutulus* moderate numbers, *Papilio multicaudata*, *Papilio eurymedon*, *Papilio polyxenes asterias*, *Papilio zelicaon*?, *Nathalis iole*, *Colias alexandra* 27m7f, some *Colias eurytheme*, *Euchloe ausonides* eggs & larvae June 28, *Oeneis uhleri*, *Argynnis aphrodite* surely, *Argynnis callippe meadii* one, *Argynnis hesperis* unsilvered some, *Argynnis hesperis hesperis* part-silvered one, *Limenitis weidemeyerii* at least 3, *Nymphalis californica timidar*, *Polygonia satyrus*, *Polygonia gracilis zephyrus*, *Euphydryas anicia capella* one, *Chlosyne gorgone*, *Chlosyne palla calydon*, *Phyciodes cocyta selenis* abundant, *Phyciodes pulchella camillus* one male, *Lycaena heteronea gravenotata*, *Lycaena rubidus* 2 females, *Callophrys eryphon*?, *Callophrys augustinus*?, *Strymon melinus* larva, *Celastrina lucia sidara*, *Cupido* “Everes” *amyntula valeriae*?, *Plebejus glandon*?, *Plebejus melissa*.

**Bradford Junction=“Turkey Creek Junction” vicinity butterflies** (higher altitude N, W, & S of Bradford Junction, June 22, 25, 26, and butterflies recorded just June 21-27, Jefferson County Colorado). Those underlined were not found by Mead in South Turkey Creek (but actually I have found all of those in South Turkey Creek Canyon near Tinytown, except *Neominois*, though *A. a. sorocko* is very rare in the canyon where I caught a stray one year). *Papilio eurymedon*, *Papilio multicaudata*, *Papilio polyxenes asterias*, *Papilio zelicaon*?, *Colias alexandra* adults & eggs, *Neominois ridingsii*, *Oeneis uhleri*, *Euptoieta claudia* numerous eggs, *Argynnis aphrodite* probably, *Argynnis hesperis* unsilvered many, *Argynnis hesperis hesperis* part-silvered, *Argynnis atlantis sorocko*? 2m, *Euphydryas anicia capella*, *Chlosyne nycteis drusius* including lectotype, *Chlosyne palla calydon*, *Lycaena rubidus* larvae, *Euphilotes ancilla barnesi*, *Cupido* “Everes” *amyntula valeriae*?, *Plebejus icarioides*, *Plebejus lupini*, *Hemiargus isola* (good guess June 23), *Glaucopsyche piasus* (good guess June 24), moth larvae on wild rose bush.

**Turkey Creek butterflies (combined records from North and South Turkey Creeks including around Bradford Junction)** (June 5-7, 21-27 {*Euchloe* immatures 28}, July 29, Jefferson County, Colorado). *Erynnis persius* one, *Hesperia nevada nevada* 1m, *Polites themistocles*? 1m1f, *Polites mystic dacotah*, *Parnassius phoebus smintheus* + 12m1f + 41m + egg + 2 eggshells, *Papilio indra* one, *Papilio glaucus rutulus* moderate numbers, *Papilio multicaudata*, *Papilio eurymedon*, *Papilio polyxenes asterias*, *Papilio zelicaon*?, *Nathalis iole*, *Colias alexandra* 27m7f & eggs, some *Colias eurytheme*, *Euchloe ausonides coloradensis* eggs & larvae June 28, *Neominois ridingsii*, *Oeneis uhleri*, *Euptoieta claudia* numerous eggs, *Argynnis aphrodite* surely, *Argynnis callippe meadii* one, *Argynnis hesperis* unsilvered many, *Argynnis hesperis hesperis* part-silvered some, *Argynnis atlantis sorocko*? 2m, *Argynnis coronis halcyone*?, *Limenitis weidemeyerii* at least 3, *Nymphalis californica timidar*, *Polygonia satyrus*, *Polygonia gracilis zephyrus*, *Euphydryas anicia capella* one, *Poladryas minuta arachne* (June 5-7 or 21-27), *Chlosyne nycteis drusius* including lectotype, *Chlosyne gorgone*, *Chlosyne palla calydon*, *Phyciodes cocyta selenis* abundant, *Phyciodes pulchella camillus* one male, *Lycaena heteronea gravenotata*, *Lycaena rubidus* 2 females & larvae, *Callophrys eryphon*?, *Callophrys augustinus*?, *Strymon melinus* larva, *Celastrina lucia sidara*, *Euphilotes ancilla barnesi*, *Cupido* “Everes” *amyntula valeriae*?, *Plebejus glandon*?, *Plebejus icarioides*, *Plebejus lupini*, *Plebejus melissa melissa*, *Plebejus saepiolus*?, *Hemiargus isola*, *Glaucopsyche piasus*, moth larvae on wild rose bush.

**Fairplay butterflies** (June 9-12, July 6{7}, July 24, Park Co. Colo.). *Erynnis icelus* one, *Hesperia nevada nevada* 1m, *Polites draco*?, *Nathalis iole* one or two seen, *Colias alexandra*, *Anthocharis julia* 10m12f, *Pieris marginalis* not uncommon, *Cercyonis oetus*, *Erebia epipsodea* (lectotype of

*rhodia*), *Oeneis calais altacordillera*?, *Argynnis mormonia* 7 specimens, *Argynnis hesperis* unsilvered?, *Boloria eunomia* abundant, *Boloria freija*, *Boloria frigga*, *Euphydryas anicia eurytion* larvae, *Lycaena rubidus*, *Lycaena florus*?, *Glaucopsyche lygdamus oro*, *Plebejus glandon*?, *Plebejus saepiolus*, *Plebejus melissa* high-altitude ssp., Polyommata blue larva [unknown species] on leguminous plant.

**Kenosha House butterflies** (June 14-19 {& *Parnassius* immatures June 20}, June 29-July 5, July 25-27 noon, Aug. 26 afternoon-27-28 morning, September 3-11, Hoosier Creek, Park Co. Colo.). *Hesperia nevada nevada* some (to barely into South Park June 16), *Polites draco*?, *Parnassius phoebus smintheus* females and egg, *Papilio multicaudata*, *Colias meadii* (one July 27 or Aug. 28), *Colias philodice* (most just N Kenosha House but some perhaps barely into South Park June 16, although *hagenii* lectotype was collected elsewhere), *Colias alexandra* + egg, *Colias scudderii* some, *Pieris marginalis*?, *Pontia callidice occidentalis* likely, *Cercyonis oetus* 4 females, *Erebia epipsodea*, *Oeneis uhleri*, *Oeneis calais altacordillera*?, *Euptoieta claudia* many eggs, *Argynnis edwardsii*, *Argynnis mormonia*, *Boloria eunomia* 40 specimens, *Boloria freija* 36 specimens, *Boloria frigga* 20 specimens, *Boloria titania helena*, *Nymphalis antiopa*, *Vanessa virginiensis*, *Euphydryas anicia eurytion* many and larvae, *Phyciodes pulchella camillus*, *Lycaena rubidus* 3 larvae, *Lycaena florus*?, *Callophrys spinetorum*, *Plebejus glandon*?

**Twin Lakes butterflies** (July 9-18—July 10 & 12 were on alpine peaks\* to SW and S--Lake Co. Colo.). *Pyrgus centaureae*\* 16-17 specimens, *Oarisma garita*, *Hesperia uncas* 31 specimens, (*H. comma* was NOT caught here), *Polites draco*\*, *Polites sonora* several males, *Pieris marginalis*?, *Pontia callidice occidentalis*, *Colias meadii*\* one, *Colias scudderii*, *Neominois ridingsii*, *Cercyonis oetus* 70 specimens, *Erebia callias*\* few, *Oeneis melissa lucilla*\* two and saw one, *Argynnis hesperis electa* lectotype, *Boloria eunomia* one, *Boloria titania helena* some, *Euphydryas anicia brucei*\*?, *Euphydryas anicia eurytion* (one specimen which is mislabeled *eurytion*, or *brucei*\*?), *Poladryas minuta arachne*, *Lycaena rubidus* 51m2f including lectotype, *Lycaena heteronea heteronea*, *Plebejus shasta pitkinensis*\*, *Plebejus melissa pseudosamuelis*, *Plebejus icarioides lycea*, *Plebejus glandon*?

**Bailey butterflies** (Aug. 25-26, 29-30-31-Sept. 1, + June 28 {*Epargyreus* at Bailey?}, + July 28 at Pine Jct., + Aug. 28 at Shawnee, all are Park Co. Colo.). *Epargyreus clarus* (Sam caught, at Bailey June 28?), *Hesperia comma* near-ochracea 1m, *Colias eurytheme*, *Cercyonis meadii* (49 specimens Aug. 25-26, 29-Sept. 1 esp. Aug. 26 including lectotype), *Argynnis hesperis* unsilvered female, (plus *Argynnis hesperis* unsilvered some & part-silvered some at Pine Jct. July 28), *Polygonia gracilis zephyrus* (including ~30 at Shawnee Aug. 28), *Polygonia faunus hylas* 20 (at Shawnee Aug. 28), *Nymphalis antiopa*, *Vanessa virginiensis*, *Lycaena florus*?, *Lycaena arota* very large number (15m75f Aug. 25-29-31-Sept. 1).

**Alpine/timberline Zone butterflies:** Peaks S of Twin Lakes (July 10 & 12, Lake Co. Colo.): *Pyrgus centaureae* 16-17 spec., *Polites draco*, *Colias meadii* one, *Erebia callias* few, *Oeneis melissa lucilla* two, *Boloria titania helena* some, *Euphydryas anicia brucei*?, *Plebejus shasta pitkinensis*. Mosquito Pass (July 8, 21, Lake/Park Cos. Colo.): *Colias meadii* 46 specimens, *Argynnis mormonia*, *Boloria titania helena* some, *Euphydryas anicia brucei*?, *Erebia callias* 56 specimens, *Oeneis calais altacordillera* 11 specimens, *Lycaena florus*? Mt. Lincoln (July 22, Park Co. Colo.): *Colias meadii* some, *Erebia callias*, *Boloria titania helena*, *Euphydryas anicia brucei*?, *Lycaena florus*? Argentine Pass (Aug. 5, Clear Creek/Summit Cos. Colo.): *Parnassius phoebus hermodur*, *Colias meadii*, *Erebia callias*, *Euphydryas anicia brucei*?, *Lycaena florus*?, *Plebejus shasta pitkinensis*. Berthoud Pass (Aug. 16, Park Co. Colo.): *Parnassius phoebus hermodur*.

**“Middle Park” butterflies** (August 6-16, Summit & Grand Counties Colorado. “Middle Park” actually does not exist as it is mostly forested valleys with little open area.): *Hesperia comma*

surely, *Parnassius phoebus smintheus* *Cercyonis oetus*, *Argynnis mormonia*, *Boloria selene tollandensis* 6 or 7 specimens, *Boloria bellona* one, (*Polygonia gracilis zephyrus* few & *Polygonia faunus hylas* 15 specimens including lectotype just N Kenosha Pass), *Lycaena rubidus* several, *Lycaena florus?*, *Plebejus glandon?*

**Apex Gulch butterflies** (August 3, Jefferson Co. Colo.): *Cercyonis pegala nephele* two, *Satyrium titus* few, *Satyrium saepium* 50 specimens, *Strymon melinus*.

**Idaho Springs vicinity butterflies** collected (August 19, Clear Creek Co. Colo.—these were inadequately located by Mead): *Hesperia comma ochracea* 1m, *Ochlodes sylvanoides napa* 1m, *Danaus gilippus thersippus* E of Idaho Springs one seen, *Argynnis hesperis* unsilvered, *Hemiargus isola*.

## Mead's Butterflies, Sorted by Butterfly Species

This section organizes all the data—from Mead (1876), letters, the journal, museum specimens, Calhoun (2015a) and other publications—by butterfly species. It lists the short field names Mead used for them, the localities and numbers collected, and immatures found, type localities, etc.—everything concerning the butterflies themselves. The scientific names used are modern names from the biological catalogue (Scott 2008) that represent actual taxa (ICZN names that do not represent actual biological taxa are ignored).

The localities and dates below are those either stated by Mead (1876) or letters or journal etc. as cited, or deduced from the dates on his specimens using clues from Mead (1876) and letters and journal for that day, plus writings by Edwards and notes by Calhoun (2015a), localities from actual museum specimens, etc. Sometimes Mead got the mileages a little wrong, for instance along the North Platte River his mileages are about 20% too large.

+ is used to indicate that adjacent sentences are all paraphrased or quoted from the same source, usually Mead (1876). Brackets [ ] enclose my comments, including numerous localities deduced from collection dates, although many localities deduced from looking up dates in the journal are not placed in brackets.

### Hesperiidae

*Epargyreus clarus* (Cramer). “My brother Samuel H. Mead Jr. gave me 3 specimens, which he took in mts. near the South Park.”+[maybe Bailey June 28?, Kenosha House is too high altitude]+(Mead 1876).

*Pholisora catullus* (Fabricius). One or two seen near Denver early in June [June 1 & 3] (Mead 1876).

*Erynnis icelus* (Scudder & Burgess). [Beaver Creek] near Fairplay, South Park, one specimen June 10 (Mead 1876). [It occurs at Hoosier Creek also, where Mead evidently did not find it.]

*Erynnis persius* (Scudder)(& “*rutilius*” (Mead)). The most common species of its genus in Colorado.+~25 specimens obtained.+“One individual [“*rutilius*”], now in Mr. Scudder’s hands for description, was taken June 23 at Turkey Creek Junction.” [South Turkey Creek June 23]+(Mead 1876).

*Pyrgus centaureae loki* Evans (“*HESPERIA*, sp. (?)” in Mead 1876). “frequents the high peaks about Twin Lakes, where 17 specimens were taken in July, all above 11,000 feet elevation (timber line)[timberline is actually ~11,500’].” [on peak 12600’ 2.2 mi. NE Quail Mtn., July 10] (Mead 1876). 16 specimens of a Hesperian [on same peak 2.2 mi NE Quail Mtn. July 10] which does not seem to be found below [timberline] [letter 151, these were *P. centaureae* contrary to

Brown's footnote #15 because Mead 1877 reported 16 specimens taken here; the gulch butterflies in Brown's note 21 were *Polites draco*]. 16 specimens total taken (Mead 1877). *Pyrgus communis* (Grote). In Colorado found in June and July (Mead 1876). Mead might have caught it in Denver June 1 & 3?

*Oarisma garita* (Reakirt)="hylax" (W. H. Edwards). Locality the flats and lower mts. at Twin Lakes: Twin Lakes [July 9-18] (Mead 1876). [E of E Twin Lake to mtn. 12600' S of Twin Lakes] paralectotype Mead specimen in CMNH collected July 10 (Brown 1964-1987 103:269, Journal July 10). Two paralectotype Mead specimens in CMNH collected July 10 [walked SW to alpine peak] & 14 [Walked 6 mi W from E of E Twin Lake] (Brown 1964-1987 103:269).

**Type locality of *Thymeticus hylax* W. H. Edwards, 1871.** O.D. has only "From Colorado; from several specimens taken by Mr. Mead." Lectotype has only "*Hylax* Col" and "Collection of T. L. Mead" labels. Mead (1876) reported collecting it only at Twin Lakes. So TL is **Twin Lakes, Lake Co. Colo.** July 9-18. The butterflies at Red Mtn. Inn. along Lake Creek to the west are smaller and a little darker than most *garita*, so *hylax* could be considered a weak subspecies by some people.

*Hesperia uncas uncas* W. Edwards="Ocytes ridingsii" Reakirt. One locality: "found at Twin Lakes in July [9-18], generally upon or near the dwarf lupines (evidently flowering *Oxytropis* or perhaps *Astragalus*, because butterflies do not nectar on lupines), which grew with bunch grass and low herbage, in open spaces between the plants of sage brush.+Altogether 31 specimens were taken."+(Mead 1876). E end of Twin Lakes July 9, Mead arrived at house just E of the eastern Twin Lake evidently owned by Mr. Derry and soon found *Hesperia* [evidently *Hesperia uncas* which occurs in prairie/Pinyon-Juniper/brushy/sage habitat such as here and near Salida and in the Gunnison Basin and does not occur in Engelmann Spruce forest] (Journal July 9).

*Hesperia juba* (Scudder)=Mead's "*Hesperia* 11" (letter 220). One locality: Hot Springs Lake near Salt Lake City, Utah, several specimens [Oct. 2] (letter 220, Journal October 2, Mead 1876). 1m2f paralectotypes coll. Oct. 2 in MCZ including 1m1f [Hot Springs Lake near Salt Lake City] Utah coll. Oct. 2 by T. L. Mead fig. Scudder (1874, pl. X, figs. 19-20).

*Hesperia comma ochracea* Lindsey and near-*ochracea* {maybe the "Hesperians (Skippers)" "B" or "C" in letter 180 August 19-20 near Idaho Springs to the foothills were *H. comma*?}. Mead did not report *ochracea*, but most of his *Hesperia comma* reports refer to *H. c. ochracea*. "This species ["colorado"], with the following ["manitoba"], appears late in the season.+Specimens were taken on the Georgetown [Aug. 18 or 19 near Idaho Springs] and South Park roads during the latter part of August."+(Mead 1876). "Of this species ["manitoba"] I have two males, taken August 19 and 30; one at Idaho Springs, the other on the South Park road [Bailey Aug. 30]."+(Mead 1876). One female *colorado* paralectotype [slightly-darker *ochracea*] MCZ Aug. 28 [near Grant in Park Co.] fig. by Scudder (1874) pl. X fig. 17. The *colorado* lectotype and paralectotype are in MCZ, the lectotype male labeled "7-13" & the state of "Colorado" (fig. by Scudder {1874} pl. X fig. 18), the paralectotype male just labeled "7-13" (its genitalia fig. by Scudder pl. XI figs. 1-2), but both are evidently actually ssp. *ochracea* or *idaho* that were misplaced into empty 7-13 envelopes, because *H. comma* from Twin Lakes where Mead collected on July 13 are predominantly darker than those two types (Scott 1975), and *H. comma* does not fly that early in the Arkansas Valley area (including Twin Lakes) and ssp. *oroplata* does not fly that early either (they fly a month later). Both types were evidently collected in Summit County or Middle Park or along the South Platte River or near Idaho Springs (or perhaps at the *manitoba* TL Lac la Hache British Columbia, as Edwards handled those BC specimens at the same time and may have mixed them up). The name *ochracea* may be replaced by *colorado*, because the types of *colorado* are evidently from the range of *ochracea* (or *idaho*), and most *ochracea* types including holotype were mislabeled by Oslar who labeled the holotype with the

worthless locality of “Platte Canyon” so the *ochracea* TL is unknown (Scott 2016). And if the *ochracea* TL is at high altitude in the Canyon where the butterflies vary considerably, the name *ochracea* may refer to the subalpine-alpine ssp. Many *ochracea* specimens look like the *colorado* types, which may be specimens of *ochracea*.

*Hesperia comma idaho* (W. Edwards). Mead was in Middle Park August 6-16 in peak flight season for *H. comma* so he surely collected it there, but did not report it. It is very hard to believe that he collected none as they are common there. Maybe those specimens will be found in museums, but unfortunately Edwards discarded nearly all the data on his specimens, so most museum specimens are useless without data and might have been collected at.....?? The two *Hesperia colorado* types resemble many ssp. *idaho* specimens as they have a clear white chevron (many ssp. *ochracea* have a clear white chevron also). They were evidently misplaced into 7-13 envelopes. That could have happened in various ways including by Edwards who may have misplaced them into envelopes that formerly contained other butterflies. Edwards removed butterflies from paper triangles many times, to examine and study and sort and pick out specimens to sell and give to Mead and others; so there were frequent opportunities to place those butterflies back with the wrong envelopes, and Edwards did not care about precise localities so he lacked motivation to place them back with the correct envelopes. Then he gave many of those envelopes back to Mead. For specimens Edwards kept and mounted, he removed and placed them on a sheet of blotting paper in a folded moist towel to soften prior to mounting (Calhoun 2015a p. 4), and separated them during mounting, then he prepared new labels with “Col<sup>o</sup>” at most, and threw away the envelopes. These butterflies fly in Colorado August 13 but very rarely July 13, and the *colorado* types were likely collected 8-13 near Hot Sulphur Springs where Mead may have mistakenly written 7-13 instead of 8-13 (Mead mislabeled others: he wrote to Edwards that he had mislabeled one day’s catch 8-6 instead of 8-5). Scudder (1874 p. 342) confirms this likelihood, as he wrote that “*P. colorado* probably appears during the second week in July [thus Scudder doubts its appearance July 7-14 even though his plate legends on p. 358 list his *colorado* lectotype and paralectotype as collected July 13 by Mead] and continues to emerge from the chrysalis until nearly the end of August, for Mr. Mead took fresh specimens [of *colorado*] during the second week of August [Scudder is definite about August 8-14 captures], and of the female throughout the entire month”. That information may have come from Mead himself, as Scudder got other *Hesperia* specimens from Mead during a late 1883 visit as well as by mail including the *Hesperia nevada* lectotype. Scudder visited Mead and they corresponded and discussed *Hesperia* and Scudder’s plans to name *colorado* and *manitoba* using some Colorado butterflies, and apparently Mead told Scudder that he had caught *colorado* in the second week in August but did not mention July. Only the two types [mis]labeled 7-13 suggest any *colorado* were collected in July; there is nothing else, and all other reported *H. comma* specimens were collected Aug. 19, 28, 30, so the *colorado* types were mistakenly associated/placed with the 7-13 envelopes by Edwards or Mead or Scudder. **Type locality of *Pamphila colorado* S. H. Scudder, 1874.** O.D. says “Colorado, about the Georgetown and South Park Roads by Mr. Mead; and in Arizona, by Lieut. Wheeler’s expedition.” Barnes & McDunnough 1916 designated lectotype as Scudder’s (1874) fig. plate X fig. 18. That lectotype has 2 pieces of paper, “7-13” cut from a paper triangle, and a second piece with the state of “Colorado”. Mead walked to head of Upper Twin Lake on July 13, so Calhoun (2015a p. 13) assumed that is the TL, and Calhoun (2015b) repeatedly argued that Mead did collect those *colorado* types at Twin Lakes July 13 because those paper 7-13 labels are Mead’s. Actually, the evidence suggests that the lectotype and paralectotype were **mislabeled** by

placing them into empty Mead 7-13 envelopes after the original specimens were removed for examining or sorting or mounting etc., because: 1) The lectotype and paralectotype are both paler than nearly all the *H. comma colorado* later collected by Scott (1975) near Twin Lakes (and MacNeill 1964 listed high-altitude dark *colorado* from Twin Lakes Aug. 18 1952 collected by J. W. Tilden), so it is highly unlikely for them to have been collected there. And Ray Stanford caught 1m2f at Scott's Granite site just down-valley of Twin Lakes on Aug. 10, 1996, which are darker than those *colorado* types. 2) *H. comma* only flies later than this in that area, and NO specimens have been caught as early as July 13 in the Twin Lakes area or in the entire range of ssp. *oroplata*, contrary to Calhoun (2015b) who misused records of other ssp. to compare (including the subalpine/alpine ssp. from Tennessee Pass to Boulder County that flies 1-2 weeks earlier {late July-August} and the western-slope *idaho* that flies slightly earlier than butterflies east of the continental divide). 3) The butterflies in 1871 did not fly earlier than normal, based on flight periods of Mead's butterflies analyzed by Scott and Mike Fisher who live in Colorado and have 109 years of Colorado butterfly experience (the Ohio-Florida resident Calhoun 2015a claimed that the capture of the summer form *Colias philodice* "*hagenii*" lectotype at Kenosha House on June 16 proved that butterflies flew early that year, but Mike Fisher insists that the non-migratory butterfly was actually misplaced into some other butterfly's 6/16 envelope because Fisher and Scott found that only the spring form flies there in South Park and Kenosha House in June 2011 and 2015. *C. philodice* does not migrate, so Calhoun 2015b later mistakenly suggested that the *hagenii* somehow freakishly got migratory genes from *Colias eurytheme* and migrated to Kenosha House from some hotter area—actually the *hagenii* specimen {color photos in Calhoun 2015a} looks like ordinary *philodice* and has no orangish and no evidence of any *eurytheme* genes, and obviously if it did migrate from some low-altitude warmer area the butterfly would offer zero evidence that butterflies flew earlier in 1871). 4) Drought did not cause earlier flight of 1871 butterflies, and weather records showed normal precipitation in 1871 (a drought in the late 1860s was over by 1871 which had normal precipitation {Mock 1991 actually recorded and graphed rain as 95% of normal in both spring and in summer 1871 contrary to the misleading citation of that paper by Calhoun 2015a; and tree-ring width analysis by Woodhouse & Brown 2001, Woodhouse et al. 2002, and Stockton & Meko 1993 conclusively proved normal precipitation and stream flows in 1871 in that area}). 5) The original description mentioned its Colorado locality as "about the Georgetown and South Park Roads" which does not include Twin Lakes and is in the range of ssp. *ochracea*. 6) This species looks very different than the other butterflies Mead caught in June and July (including *Hesperia uncas* which is grayer and has conspicuous white veins on unh) so Mead would have noticed catching it, yet Mead (1876) made no mention of catching it at Twin Lakes (he only described *colorado* from the Georgetown and South Park Roads, and *manitoba* from Idaho Springs and the South Park road). (Calhoun 2015b intimated that Mead knew nothing about this species, and it is true that Mead didn't know the correct scientific names of most species, but Mead could tell the difference between species as he gave simple field names to 13 different Argynnis species and 11 Hesperiid species. Mead could not tell the difference between Scudder's *colorado* and "*manitoba*" taxa simply because no one can tell the difference between them in Colorado--Scudder mistakenly described those two "species" from Colorado where only one species actually exists.) 7) Mead's letters (Brown & Brown 1996) made no mention of any butterfly like this from Twin Lakes. 8) Mead's Journal July 13 ["walked up the head of the upper Twin Lake"] made no mention of any butterfly like this from Twin Lakes. 9) Mead (1876) wrote that this species appears "late

in the season”, while July 13 is the middle of the season. 10) Scudder (1874 p. 342) doubted that Mead caught specimens in the second week of July as he wrote only “*P. Colorado* probably appears during the second week in July” despite his plate legend listing a date of July 13 for the lectotype and paralectotype. 11) Scudder’s paper appeared in December 1874 (Calhoun 2015b p. 180), and Mead knew of Scudder’s paper in late 1873, so there was plenty of time for Mead to tell Scudder that he had caught *H. comma* in July 1871 if Mead had actually caught them in July 1871, but Mead did not do so. 12) And Mead inserted citations of Scudder’s 1874 paper into the *colorado* and *manitoba* entries in his Mead (1876) report but chose not to insert the July 13 captures that Scudder’s (1874) figure legend claimed, evidently because Mead doubted that he had captured the butterflies in July. 13) Scudder (1874 p. 342) confidently wrote that “Mead took fresh specimens [of *colorado*] during the second week of August” (those August 8-14 *idaho* specimens are now apparently lost, as someone evidently discarded their data, so it’s possible those may be the *colorado* types). 14) The August 19 Idaho Springs and August 30 Bailey “*colorado*” and “*manitoba*” specimens mentioned by Mead (1876) seem to be missing, so those *ochracea* specimens could be the two *colorado* types, mixed up and placed into 7-13 envelopes by Edwards or Scudder or someone else. 15) Global warming has accelerated since 1871 as CO<sub>2</sub> ppm has risen from 280 to 400+, and the Twin Lakes area was hotter in 1971 (the Scott 1975 specimens) than 1871, so the paler lower-altitude butterflies are evidently gradually spreading northward along the gentle-gradient Arkansas River valley, so the 1871 butterflies were probably darker than the 1971 specimens, making it even less likely that the *colorado* types came from Twin Lakes in 1871. 16) Scudder (1874 p. 342) confidently wrote that “Mr. Mead took fresh specimens [of *colorado*] during the second week of August”, when Mead was in Summit and Grand Counties in the range of *idaho* August 8-14, so if Mead mistakenly wrote 7-13 instead of 8-13 on the envelope containing those *colorado* specimens, those specimens may actually be *idaho* specimens collected near Hot Sulphur Springs where Mead collected August 12-14 (many *idaho* in those counties and Eagle Co. etc. look like the *colorado* types). Conclusion: The *colorado* types were evidently collected in August in the Front Range or Grand County or Middle Park (or perhaps even in BC by George R. Crotch with the *manitoba* lectotype) and misplaced into the mis-dated envelopes, maybe by Edwards, as he did with the *Colias hagenii* lectotype. Or Mead collected them August 13 at Hot Sulphur Springs and mistakenly wrote 7-13 instead of the correct 8-13 on the envelopes as noted above (this is likely, as Scudder wrote of *colorado* “Mead took fresh specimens in the second week of August”, when Mead was in the range of *idaho* in Grand County and Middle Park during its peak flight time). Or Scudder switched 7-13 envelopes that had contained *Hesperia uncas* with the envelopes containing the *colorado* types caught that were *ochracea* or *idaho* (or BC near-*idaho*) during the process of examining and identifying and relaxing and mounting fresh specimens and discarding damaged and dermestid-chewed specimens that he got from Edwards, etc. (paper triangles snap shut when opened, so specimens have to be removed from envelopes while examining, and of course while mounting). There are numerous ways the specimens and envelopes could have been mixed up, and we may never know which way it happened. Here’s another plausible way: Edwards had to remove the specimens from the triangles of *Hesperia uncas* and *H. comma* etc. and place them on his table to examine and sort and mount and pick out specimens to sell, and someone passing by could blow or knock some envelopes off the table, then the envelopes would be placed back onto the table by that person who would not want to be yelled at or fired for knocking them off, and some 7-13 *uncas* envelopes could be placed beside the *colorado* types; then

the types would be placed into those wrong 7-13 envelopes. Edwards was a data-discarding machine who created numerous mixups because he sorted butterflies by phenotype (rather than geographic range and phenotype) into “species” and his goal was to find hundreds of new species and name them and he was careless about localities (he frequently only placed labels at the head of a series not on individual specimens, he threw away hundreds of Mead’s envelopes containing month and day of capture, he renamed some species several times, he forgot what he had named several species, and—his worst blunder—he received a specimen from his brother in the Philippines and renamed and labeled it as a new species from West Virginia!). So TL is everywhere Mead collected *H. comma idaho* and *H. c. ochracea*, including Hot Sulphur Springs and Idaho Springs and Bailey: **TL is Clear Creek, Jefferson, Park, Summit, and Grand Cos. Colo.**

*Hesperia nevada* (Scudder)=Mead’s “*Hesperia* 8” (label on lectotype in MCZ). About three localities: “quite common in June in the mountains about the South Park, and in park itself.+It does not seem to appear later than July.”+(Mead 1876). 4 specimens from Colorado T. L. Mead in MCZ are fig. by Scudder (1874) pl. X (fig. 1 lectotype male “Hesp 8 Col<sup>o</sup> June 12” [walked several mi. up Beaver Creek from Fairplay]; fig. 4 paralectotype male June 23 [SW from Bradford Junction]; fig. 3 paralectotype female June 17 [Kenosha House]; fig. 16 paralectotype female [*H. nevada* misidentified as *Pamphila colorado*] “Colo”); (pl. X fig. 2 “nevada” is actually *Hesperia comma* ~*hulbirti* Lindsey female Ore. [collected by Dr. Gabb] received from W.H. Edwards). 1 paralectotype male in MCZ June 17 [Kenosha House] T.L. Mead, Mr. B[laire coll.] (Calhoun 2015a p. 22). 2m3f paralectotypes in CMNH June 16 [walked SW from Kenosha House over Kenosha Pass barely into South Park], butterfliesofamerica.com. **Type locality of *Pamphila nevada* S. H. Scudder, 1874.** O.D. states “taken in Colorado by Mr. Mead, on the mountains about the South Park and in the Park itself. Mr. W. H. Edwards has also sent me specimens from Nevada, California and Oregon, the last collected by Dr. Gabb.” Lectotype labeled “Hesp 8 Col<sup>o</sup> June 12” in Mead’s handwriting [from Mead’s collection]. Barnes & McDunnough (1916) restricted TL to South Park Colo. and designated lectotype as Scudder’s Pl. X fig. 1, which was collected July 12 when Mead **walked several miles up Beaver Creek from Fairplay**, the TL.

*Polites draco* (W. Edwards)=Mead’s “Hesperian 7” (letter 151 with footnote 21 only)=“*Hesperia* 1” (Brown 1964-1987 106:48). One to up to three localities: Peak S of Twin Lakes: “found Hesperian 7 in a rocky gorge far below the timberline” [evidently Flume Creek just N of peak 12400’, 2.5 mi. E of Quail Mtn, south of Twin Lakes July 12—*P. draco* raits in gulches] (letter 151, Brown’s footnote 21 refers to *P. draco* because it raits in gulches and occurs mostly below timberline, whereas Brown’s footnote #15 concerning “16 specimens of a Hesperian which does not seem to be found below [timberline]” refers to *Pyrgus centaureae* which occurs higher and Mead 1877 said he caught 16 *P. centaureae* here). Twin Lakes (Mead 1876). 3 pairs labeled “Hesperia 1” in CMNH with various dates on pieces of paper triangles [Twin Lakes probably], and “Collection T. L. Mead” (Brown 1964-1987 106:48); Brown p. 49 wrote that Mead was at Twin Lakes July 9-13 but he was actually there July 9-18, so if the dates on those labels are within that range those 3 pairs are from Twin Lakes. *P. draco* now occurs at Hoosier Creek next to Kenosha House, but Mead evidently failed to collect it there, unless the “various dates” in Brown 1964-1987 includes days when he was at Kenosha House (and Fairplay?) instead of Twin Lakes. **Type locality of *Pamphila draco* W. H. Edwards, 1871.** O.D. has only “Taken in Colorado, by Mr. Mead.” Lectotype has “*Draco* male Col<sup>o</sup>” and “Collection W. H. Edwards” labels. Mead (1876) wrote it is “moderately abundant in the mts. of Colorado during June and the early part of July. Specimens were brought by the expedition from Southern Utah, and from Twin Lakes, Colorado.”, so maybe that writing refers to Mead’s collection from Twin Lakes, as



the journal and letters etc. list no other *draco* Mead collected elsewhere than Twin Lakes. Letter 151 (footnote #21 source only) says Mead coll. *draco* in gulch far below timberline on smaller peak S Twin Lakes July 12, so TL is **Flume Creek just N of peak 12400', 2.5 mi. E of Quail Mtn, south of Twin Lakes July 12 and Twin Lakes on other dates**, depending on the localities of those "various dates" (if some dates are not July 9-18 the TL would include those other sites such as **Kenosha House and/or Fairplay**). There is no evidence Mead coll. *draco* on July 9, as Calhoun (2015a p. 13) wrote, when Mead was at W side of upper Twin Lakes in evidently the wrong habitat. Calhoun (2015a) missed discussing the TL of *Polites draco*.

*Polites themistocles* (Latreille). "One male and one female were taken in Colorado." [no location, probably coll. by Mead at Turkey Creek June 5-7, 21-27] (Mead 1876).

*Polites mystic dacotah* (W. Edwards). Evidently only one specimen, from Turkey Creek. This species was not mentioned by Mead in any letter or journal etc., but the O.D. says the holotype is a Mead specimen, named 3 months after Mead was in Colo. in W. H. Edwards' paper naming many other Mead specimens. Brown (1964-1987 106:52) and Calhoun (2015a) show that Mead's (1876) *napa* concept also included *Polites mystic dacotah* (as the holotype label shows), but the holotype has no label evidence proving it is a Mead specimen. Calhoun suggested it was probably collected near Idaho Springs Aug. 19 [but the species occurs east to Apex Gulch], but that is **bogus** as noted below. **Type locality of *Hesperia dacotah* W. H. Edwards, 1871.** O.D. has "From Colorado, taken by Mr. Mead." Holotype has "*napa* male =*dacotah* (type) Col<sup>o</sup>" and "Collection W. H. Edwards" labels. Mead (1876) and letters and journal did not mention this species, evidently because Edwards BNA Synopsis of N.A. butterflies wrote that it was a synonym of *Ochlodes sylvanoides napa*, so if (a bogus guess) *dacotah* was included in the range of *napa* that Mead (1876) described, it could have been coll. anywhere from Idaho Springs to Apex Gulch. Scott (2008) mistakenly stated a TL of Georgetown to Idaho Springs, and Calhoun (2015a p.22-23) mistakenly stated lectotype probably coll. at Idaho Springs Aug. 19. So a reasonable TL based on that area would be vic. Idaho Springs, Clear Creek Co. Colo. Aug. 19, because Georgetown is too high altitude for this species. However there is a big problem: *dacotah* does NOT fly as late as Aug. 19. The 420 specimens in Scott collection are dated May 29 (one), June 7 (common in Lakewood Colo. in 1966 but never again that early) to July 31 (one) and Aug. 4 (one), and none after that. It flies from late June to mid July mostly. I have not been able to find any other person's specimens collected as late as Aug. 19. There are too many bogus guesses in this case [not as many bogus guesses as the ridiculous chain of ~four bogus guesses F. M. Brown made to concoct his bogus TL of *Lycaena cupreus*, but too many], so we must use biology instead of bogus history. This is a foothills-plains species, and Mead was in South Turkey Creek Canyon at the peak flight time of this species, so the TL has to be **South Turkey Creek, Jefferson Co. Colo., June 21 23 24 27.**

*Polites sonora utahensis* (Skinner). "Several specimens, all males, were obtained at Twin Lakes about the middle of July." [July 9-18] (Mead 1876).

*Ochlodes sylvanoides napa* (W. Edwards), 186=Mead's "*Hesperia A*" (Brown 1964-1987 106:71--letter 180 says A8.19 may differ from A8.20; the identity of B and C is unknown). "I found a few specimens in August near Georgetown, Colo." [Idaho Springs evidently as Georgetown is too high altitude, and a *napa* specimen in CMNH has label *Hesperia A* Aug. 19 when Mead was at Idaho Springs].+Two specimens in Yosemite Valley Oct. 21 (Mead 1876). **Type locality of *Hesperia napa* W. H. Edwards, 1865.** The original type (O.D. says "Taken by Mr. Ridings at Empire City, Colorado Territory.") was lost, so Brown designated a neotype, which is a Mead 1871 specimen with only "*napa* male Col<sup>o</sup>" and "Collection W. H. Edwards" labels, collected by Mead (Brown 1964-1987 106:71). Mead (1876) reported collecting only "a few specimens near Georgetown, Colo." A female in CMNH is labeled "*Hesperia A*/Aug. 19" (Calhoun 2015a p.

23), thus was coll. vic. Idaho Springs, Clear Creek Co. Colo. Aug. 19. That location is a reasonable determination of the neotype TL because Georgetown may be too high in altitude for this species. However, Art. 75.2 states that a neotype must not be designated as a matter of curatorial routine, as Brown's was, therefore the neotype is invalid, so the TL is "**Empire, Clear Creek County, Colorado**", or eastward toward Idaho Springs at a lower altitude where *napa* surely flies if it does not occur at Empire.

Hesperiidae=Mead's "Hesperians". Panama City, Panama. Caught some pretty Hesperians [Hesperiidae] before breakfast. (Journal November 29).

#### Papilionidae

*Parnassius phoebus hermodur* Hy. Edwards was not separated from ssp. *smintheus* by Mead, but I separate them here. Two localities at least: [Adults] small on Berthoud Pass Aug. 16 (letter 208). "Continental divide near Gray's Peak" [Argentine Pass {which is 13207' 2 mi. ESE Gray's Peak}, in Clear Creek/Summit Co. Colo.] Aug. 5 ("I mistakenly marked this 8.6 instead of 8.5") (letter 177). In Colorado at 12000' may be found until the last of August (Mead 1876).

*Parnassius phoebus smintheus* Doubleday=*sayi* W. Edwards=Mead's "*Parnassius 1*" (letter 129). 241 specimens of *Parnassius* were collected total (Mead 1877). Localities: In Colorado abundant from first foothills starting in May [records from the expedition?, because Mead did not collect in May], to the highest peaks.+Adults suck nectar from *Sedum* [*lanceolatum*] before their wings have thoroughly stiffened.+Eggs laid on *Sedum* and hibernate.+Egg and 1<sup>st</sup>-stage larva described.+(Mead 1876). Bodies are white in some, dirty yellow in others [due to Compositae pollen] (letter 158 written July 24). [South] Turkey Creek Can. (Journal June 5). Walk 8 miles down South Turkey Creek from Bradford Junction, June 6 13m (~12m1f) (letter 129). [Bradford Junction] Walked 1 ½ mi. down the road [ENE to South Turkey Creek] caught 41, most males (Journal June 7, letter 129). From Bradford Junction walked 2 miles down the road [ENE to South Turkey Creek] found 2 empty eggshells on *Sedum lanceolatum* (Journal June 21, letter 142). From Bradford Junction went down the road about 1 ½ miles [ENE to South Turkey Creek] egg on *Sedum lanceolatum*; set up a laying [oviposition] box for *Parnassius* (Journal June 23). Kenosha House ~June 19 female for eggs coll. by Mr. Samuel L. Blair (brought early June 20) (letter 142). Kenosha House, female with an egg undeposited & several on a tuft of "grass." (Journal June 20). Egg described; several eggs were on the *Sedum* (from N of Fairplay July 24?, letter written July 25) (letter 159). [Banks of Blue River Summit Co. Aug. 8-10] male and female somewhat different from low altitude specimens. (letters 177, 208). Rearing efforts: Eggs laid indiscriminately [in cage] I have 100 from Bradford Junction June 27 (letter 145). I will send Mr. Blair eggs I find to rear (letter 163 written July 26). At Kenosha House placed *Sedum lanceolatum* and 60 *Parnassius phoebus smintheus* eggs in a box, & mailed 1 ½ lbs. of *Sedum* to W. H. Edwards. (Journal July 27). Egg opened and half-developed larva was inside not dried up, Mr. Blair can maybe be talked into rearing them (says Aug. 21 letter 180). Dissected egg ?Aug. 27 [egg from before] and found complete black larva inside (letter 185 from Kenosha House). Eggs hibernate (letter 208).

*Papilio glaucus rutulus* Lucas. [Walk 8 miles down South Turkey Creek from Bradford Junction] June 6 moderate numbers, some at mud, some on Compositae flowers (letter 129).

*Papilio eurymedon* Lucas. "I have taken in the mts. of Colorado at 7500' [Turkey Creek]." (Mead 1876).

*Papilio multicaudata multicaudata* Kirby=Mead's "*Papilio 2*"=female Mead's "*pilumnus*" (letter 129). Two localities: [Walk 8 miles down South Turkey Creek from Bradford Junction, getting to 1.5 mi. S of Tinytown], some males, plus two females on purple *Delphinium*=larkspur flowers [Mead called females "*Papilio #2 pilumnus* perhaps" but those are obviously *multicaudata*

females because females look more like *pilumnus* with wider black bands and bigger tails, and *P. multicaudata* loves *Delphinium*] June 6 (letter 129, Journal June 6). “Rarely occurs far above 7,500 feet elevation.” [which implies he did catch it at 7500’ South Turkey Creek, June 5-7, 21-27, July 29] (Mead 1876). From Kenosha House walked up the road a little way [S toward Kenosha Pass] on *Salix* catkins including a female *multicaudata* (Journal June 17).

*Papilio indra indra* Reakirt. Ruts in [South] Turkey Creek Can. one specimen (Journal June 5, letter 129).

*Papilio polyxenes asterias* (Stoll). “I have not found the species at elevations greater than 7,500 feet.” (Mead 1876) [which implies he did catch it at 7500’ South Turkey Creek, June 5-7, 21-27, July 29].

*Papilio zelicaon* Lucas. Mead might have collected this, but provided no details. Maybe he saw or caught some at Turkey Creek June 5-7 or 21-27?

#### Pieridae

*Nathalis iole* Boisduval. Two localities: South Turkey Creek 7500’ about the 20<sup>th</sup> of June [June 21 23 24 27], a few days later one or two seen in South Park [Beaver Creek at Fairplay July 6{7}] (Mead 1876).

*Colias meadii meadii* W. Edwards=Mead’s “*Colias* 5” (letter 158). 65 total specimens collected (and 274 for the other four *Colias*, Mead 1877). Localities: First found Mosquito Gulch July 8 [12 specimens], abundant two weeks later [July 21, 34 specimens, letter 158].+Mt. Lincoln [seen July 22].+“Gray’s Peaks” [Argentine Pass, which is 13207’ 2 mi. ESE Gray’s Peak, in Clear Creek/Summit Co. Colo. Aug. 5].+Disappears about mid August.+(Mead 1876). [Last specimen Kenosha Pass July 27 or Aug. 28 (Brown 1964-1987 99: 91-92 Mead letter)] Alpine, scarcely ever found as low as 10,000 ft.+Mosquito Pass above 11000’ on top of “Snowy Range” for an hour July 8, 11m1f (letter 151). Near summit of peak [the peak evidently 12600’ 2.2 mi. NE Quail Mtn.] S of Twin Lakes, one specimen July 10 (letter 151, Journal July 10). Found some on the road from Fairplay to Montgomery City and Mt. Lincoln [evidently N of Alma as this is a subalpine/alpine butterfly] (Journal July 22). **Type locality of *Colias meadii* W. H. Edwards, 1871.** O.D. has NO locality or date information! Lectotype has only “type *Meadii* male Col<sup>00</sup>”. But Brown (1964-1987 99:91 notes that Edwards BNA I:51 wrote “Taken in Colorado by Mr. T. L. Mead, in the month of July, 1871.”+Brown notes that Mead’s letters state that the first 12 specimens were coll. Mosquito Pass July 8, and Brown states that July 21 Mead coll. 34 on Mount Lincoln [an error as he was on Mosquito Pass then], and one on Kenosha House “Pass”. 5m1f paralectotypes in Mead collection in CMNH have *Colias* 5 7-21[Mosquito Pass]. So TL is everywhere Mead collected it: **Peak S Twin Lakes Lake Co.; Mosquito Pass Lake/Park Co.; Mt. Lincoln and Alma, Lake Co.; Kenosha House Park Co. Colo.; and Argentine Pass, Clear Creek/Summit Cos. Colo.** The July 8 date of lectotype written by Calhoun (2015a, p. 13) is just a guess.

*Colias alexandra alexandra* W. Edwards=Mead’s “*Colias* 1”=“*Colias* 3” (Calhoun 2015b, letter 151). Localities: Flies about the middle of June, quite disappeared by the last of August.+For a time abundant on all the headwaters of the Platte [Kenosha House, and Fairplay{July 6(7)}].+Eggs laid on wild lupines.+(Mead 1876). Walk 2 mi. E of Bradford Junction to South Turkey Creek June 21, 27m7f (“females “not *interior*” show some variation in the orange suffusion on the secondaries” [the orangish ones are presumably *eurytheme*, as orangish-tinted-uph ssp. *alexandra* are very rare in males, and absent in females]) (letter 142); male coll. same locale June 21 fig. by Holland 1931 pl 35 fig. 6 (not a syntype) (Brown 1964-1987 99:61). Walk north of Bradford Junction along North Turkey Creek to gulch SW of Berrian Mtn. male with clipping “*Colias* 3 6/26” (Calhoun 2015b). Walk 1 ½ miles E of Bradford Junction to South

Turkey Creek with clipping “*Colias* 3 female 6/27” MCZ (Calhoun 2015b). Junction [Bradford Junction June 21-27] albino female pure white with pink fringes (letter 148). Gulch N of Bradford Junction [head of North Turkey Creek] June 22 eggs found on leguminous plant “probably *eurytheme*” [but he caught numerous *alexandra* here so they were probably *alexandra*] (letter 142). [Kenosha House June 29-July 5] yellow female resembles 3 white ones except fringe white (some are *alexandra*?)(letter 151). [Kenosha House June 29-July 5] 2 more albino females (most females of *scudderii* are white, and most *alexandra* are yellow, but these may be white *alexandra*?, letter 148). Kenosha House.+Hunted for butterflies but found not very many.+Placed two *Colias alexandra* females in laying boxes for eggs (Journal July 26). Rearing efforts: Kenosha House July 26 seen laying an egg, I put female in laying box in charge of Mr. Blair (letter 163). Laid several eggs at Kenosha House [July 26-27?] Mr. Blair will send to you W. H. Edwards (Aug. 17 letter 177). Eggs Mr. Blair tended at Kenosha House died after one grew to a considerable size and was green with black head, the pigs rooted through the fence and ruined the previous *alexandra* laying boxes (letter 185 Aug. 27). Kenosha House caught a *Colias alexandra* and set it in laying boxes to get eggs (Journal August 27). Female put in laying box to get ovip. Kenosha House, Aug. 26-27 (letter 185). Mr. Blair brought a half-grown larva, Kenosha House, Sept. 2 (letter 189).  $\frac{3}{4}$ ” larva deep green with two dorsal and a lateral yellowish white stripe, the latter with a very narrow interrupted pinkish line running through it; head and prolegs also green (letter 191).  $\frac{3}{4}$ ” larva was ichneumonized and died ~Sept. 7 (letter 194 from Kenosha House).

*Colias eurytheme* Boisduval (and form *ariadne*) =Mead’s “*Colias* 6” (letter 220). Localities: Cheyenne Wyo. saw one (Journal May 31). Walk 2 mi. E of Bradford Junction to South Turkey Creek June 21 (“females show some variation in the orange suffusion on the secondaries” [so the orangish ones are evidently *eurytheme* even though reported as *alexandra*, as *alexandra* females lack orange) (letter 142). Rarely found above 11,000’ in Colorado (Mead 1876). Male female on spreading board [locality unstated probably Bailey where he made spreading board based on Journal Sept. 1] (package sent Sept. 8 to Mr. Joseph Bailey Deer Valley CO, letter 197). Occasionally found between South Park and Cañon City [maybe near Florissant] Sept. 15-18 (letter 208). Mostly males form *ariadne* & *keewaydin* Yosemite Calif. Oct. 20-21 (letter 220). Yosemite, Oct. 20, caught many small orange (Journal Oct. 20). Oct. 21 found few *eurytheme* on both sides of Merced [River, in Calif.] (Journal Oct. 21).

*Colias philodice eriphyle* W. Edwards=*hagenii* W. Edwards. Most specimens taken in June in Colorado, not as abundant as *C. eurytheme*.+Some resemble eastern specimens, others are paler with greenish tint [the spring form].+(Mead 1876). From Kenosha House walked “3 miles” barely into South Park and found many *Colias* [*C. philodice* spring form] (Journal June 16), [collected lectotype *hagenii* labeled 6/16=June 16 here, but the specimen was a **mis-labeled** summer form from his trip later in the summer, as noted below]. [In 2015, *C. philodice* spring form was fairly common along Hoosier Creek next to Kenosha House {M. Fisher, J. Scott}, but was not found in the nearby bottom of South Park, and Mead did not specify where on that walk he caught the *Colias*, so Mead evidently caught most of the *philodice* along the walk between Hoosier Creek and Kenosha Pass.] **Type locality of *Colias hagenii* W. H. Edwards, 1884.** O.D. says “From 20m24f from various localities, from So. Colorado to Montana and Dacotah (Bismarck)”. Lectotype male and paralectotype male have labels “Col° 6/16”, when Mead collected from Kenosha House to barely into South Park on June 16, 1871. However, the lectotype was **misplaced** by Edwards into an envelope with that date because it is a summer form and only spring forms occur there and around South Park in June (Fisher 2012). Fisher’s collections at Beaver Creek near Fairplay in June 2011 proved that only the spring form occurs in June, and even in August some summer forms occur with the spring form but they are not as

yellow on ventral hindwing as lower altitude butterflies; and Fisher and Scott found only the spring form along Hoosier Creek in June 2015. *C. p. eriphyle* does not migrate, and the specimen is not a hybrid with *eurytheme* that somehow infused it with migratory genes that made it fly a long way to get to Kenosha Pass as Calhoun (2015b) guessed (there is no orangish on the specimen, and yellow mutants of *eurytheme* are unknown in Colorado and only known in California) (and *Colias* are fast flyers, but *C. eurytheme* is not migratory in Colorado, as I have not seen any definite migrations in 55 years in Colorado, and Jack Harry placed larvae in litter under *Lupinus* bushes in northern Utah and found that Rocky Mts. *eurytheme* survive freezing winters and overwinter, unlike the true migrants). (Of course, if the bug did migrate into the area from some hot place far away after freakishly receiving migrant genes from *eurytheme* as Calhoun 2015b mistakenly guessed, the TL would of course have to be the origin of that butterfly and not the destination, so the TL would have to be that lowland hotter area.) So the TL is just the vague “**Lake, Park, Jefferson, Denver, Clear Creek, Summit, or Grand Cos. Colorado**”, the totality of Mead’s later travels in Colorado where and when the summer form flies.

*Colias scudderii scudderii* Reakirt=Mead’s “*Colias* “interior” (letter 148)=Mead’s “*Colias* 4” yellow female according to descriptions (letter 151, later in letter Brown wrongly said “*Colias* 4” was *eriphyle* but the descriptions match *scudderii*). [At end of letter 163 Brown says Mead’s “*Colias* 3” is *scudderii*, but that is evidently wrong as Calhoun (2015b) found male and female *Colias alexandra* in MCZ labeled *Colias* 3 June 26-27, and letter 151 suggests it is *alexandra* as *Colias* 4 is called *scudderii*.] Two localities: Twin Lakes where it replaces *C. alexandra*, not uncommon in July, refused to lay on lupines (Mead 1876). Twin Lakes bright yellow female [July 9-12 letter 151, Brown wrongly says it’s *eriphyle*). [Kenosha House June 29-July 5] yellow female resembles 3 white ones except fringe white (maybe *alexandra*)(letter 151). [Kenosha House June 29-July 5] 2 more albino females (most females of *scudderii* are white, but these may be white *alexandra*?, letter 148). Kenosha House July 26 female (letter 163). Kenosha House, Mr. Blair caught a female *Colias scudderii* which I set in laying box for eggs (Journal August 27). Mead was mostly too early at Fairplay to catch *C. scudderii*.

*Anthocharis julia julia* W. Edwards=Mead’s “*Anthocharis* 2” (letter 148). One locality: The O.D. says “From 22 specimens, 10m, 12f, taken by Mr. Mead, on the 9<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> of June, 1871, in the pine woods of the mountains immediately surrounding the South Park, at Fairplay, Colorado. The species was not seen elsewhere.” Flew up in the pine woods difficult to chase [Fairplay July 9-12] (letter 148). Only taken near Fairplay in woods and on banks of Beaver Creek NE of Fairplay, a number of specimens June 12 to 24 [actually 9-12] (Mead 1876) [Edwards Butt. N.A. wrongly says July 12 for June 12]. Caught at Fairplay (Journal June 10). [Letter 151 describes Beaver Creek floodplain as flat and dry with many shrub willows.] **Type locality of *Anthocharis julia* W. H. Edwards, 1872.** Lectotype says only “*Julia* male type Col<sup>o</sup>”. O.D. says “From 22 specimens, 10m, 12f, taken by Mr. Mead, on the 9<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> of June, 1871, in the pine woods of the mountains immediately surrounding the South Park, at Fairplay, Colorado. The species was not seen elsewhere.” Journal June 11 says he was in the woods on opposite side of South Platte, but O.D. says he collected none that day. On those three dates Mead coll. at **woods at Beaver Creek N of Fairplay, Park Co. Colo.** so that is the TL.

*Euchloe ausonides coloradensis* (Hy. Edwards)=Mead’s “*Anthocharis* 1” (Calhoun 2015a p. 23). 57 total specimens taken (79 for “*Anthocharis*” minus 22 for *A. julia*, Mead 1877). One proven locality: Abundant throughout mountains in June.+Eggs laid on Cruciferae, larva pupa described.+(Mead 1876). “found in all situations throughout the Territory.” (W. H. Edwards Trans. Amer. Ent. Soc. 4:62, 1872, in O.D. of *Anthocharis julia*). The eggs and larvae and pupae noted below in letters 148 & 151 and Journal June 28 are evidently *Euchloe ausonides* because

the larva description in letter 148 fits *Euchloe ausonides* not *Pontia*. Also, Mead told Henry Edwards that the one adult that emerged was *Euchloe ausonides* (Calhoun 2015a p. 23). [Bradford Junction], very wet & soggy.+Got many [not *Pieris*1 *Pontia protodice*] eggs & larvae (Journal June 28). [evidently Bradford Junction] *Euchloe ausonides* [NOT "*Pieris* 1"] larvae described {"The head is round, green and speckled with black. The body is also dotted with black granules, marked with 3 lead-colored stripes. Between them are two yellow stripes of similar width. The lateral lead colored ones are edged below with white shading into yellow. Below, bluish green"} ["The lateral lead colored ones are edged below with white shading into yellow" fits *ausonides*, not *Pontia*}], host the "tall slim specimen" [probably *Arabis*?] (letter 148 sent June 29). Live larvae and pupae [not "*Pontia protodice*=*Pieris* 1"] sent July 7 (letter 151). **Type locality of *Anthocaris coloradensis* H. Edwards, 1881.** Calhoun (2015a p. 23-24) details this. O.D. merely says "Colorado." The lectotype and paralectotype from Henry Edwards' collection in AMNH have his handwritten labels identifying them as types of *coloradensis*. And Henry Edwards evidently thought that Mead's "*Anthocaris* 1" was *coloradensis*. Brown examined the male syntype and concluded it was a Mead 1871 specimen sent to Henry Edwards by W. H. Edwards, and it may the specimen W. H. Edwards sent to H. Edwards in early July 1871, but there is no other concrete proof for or against that view. Kurt Johnson designated that male in AMNH as lectotype; a female paralectotype in AMNH may also be a Mead 1871 specimen or might be a specimen caught by another collector and sent to James S. Bailey then to Henry Edwards (Calhoun 2015a). W. H. Edwards (Butt. N.Amer. 1874) wrote of Mead finding immatures at Turkey Creek Junction in 1871 [June 28, letter 148], and Mead later wrote to H. Edwards that one emerged as *ausonides*. Paul A. Opler (1966) wrote that the TL is Turkey Creek Junction where Mead had collected *ausonides*. Mead must have caught them in 1871, because he sent several to H. Edwards in 1872 (letter mentioned by Calhoun). The provenance is not good, but the lectotype is probably a Mead 1871 specimen from Turkey Creek Junction, so the TL is **probably Turkey Creek, Jefferson Co. Colo.**, evidently June 5-7.

*Pieris marginalis mcdunnoughi* Remington. One confident locality and other probables. First met near Fairplay June 12 not uncommon at edges of woods.+Later in June seen at most places where collections were made [evidently Kenosha House June 14-19, June 29-30], disappeared by last of July [so present mts. near Twin Lakes July 9-18].+(Mead 1876).

*Pontia protodice* (Boisduval & Le Conte)=Mead's "*Pieris* 1" males (letter 148)=Mead's "*Pieris* 2" females ("*Pieris* 2" is *P. protodice* female from plains (letter 148) but is *Pontia callidice occidentalis* at Fairplay (letter 148, and evidently Kenosha House also?). 106 total specimens of 3 species of *Pieris* and *Pontia* were collected (Mead 1877). Only one confident locality, because Mead evidently confused it with *P. callidice occidentalis*: Occurs everywhere in Colorado below timberline, and remains nearly all summer (Mead 1876). Denver near Platte River June 1, 9 specimens (letter 122). The eggs and larvae and pupae noted in letters 148 & 151 and Journal June 28 are evidently *Euchloe ausonides* because the larva description in letter 148 fits *Euchloe* not *Pontia* and Mead told Henry Edwards that the one adult that emerged was *Euchloe ausonides* (Calhoun 2015a p. 23).

*Pontia callidice occidentalis* (Reakirt)(Mead's "*Pieris* 2" is *Pontia protodice* female on the plains {letter 148} but is evidently *Pontia callidice occidentalis* at Fairplay {letter 148}, and evidently Kenosha House also?). Two localities at least: "On plains [maybe error?, probably misidentified *protodice* female—however Scott has found *occidentalis* common with *protodice* at Barr Lake Adams Co. on the plains] as well as at considerable elevations May until August" (Mead 1876). "*Pieris* 2" sometimes flew up in the pine woods difficult to chase, [Fairplay July 9-12] (letter 148). Eggs and hosts are perhaps confused: Adults seen and eggs found [~Kenosha House June

29?] (letter 148). *P. occidentalis*? hostplant with larger leaves, [Kenosha House, ~June 29-July 5] (letter 148).

#### Nymphalidae

*Danaus gilippus thersippus* (H. Bates)=Mead's "Berenice". One seen: E of Idaho Springs saw one (Journal August 19). "near Georgetown" [near Idaho Springs] one seen (Mead 1876, letter 191). *Danaus plexippus* (Linnaeus). Mead might have collected this in Colorado, as Mead (1876) wrote it was abundant in the Rocky Mountains.

*Morpho*. Panama City, Panama "before breakfast caught a beautiful *Morpho* in the town itself." (Journal November 18-20).

*Coenonympha tullia ochracea* W. Edwards. Abounds throughout all the mountainous regions of Colorado June-July, none seen later than August.+75 specimens taken.+(Mead 1876). Rearing efforts: I will send laying boxes to Mr. Blair at Kenosha House to try to get eggs (letter 163 written July 26).

*Cercyonis pegala nephele* (Kirby). Two specimens Apex Gulch early Aug. [3], no others seen (Mead 1876).

*Cercyonis meadii meadii* (W. Edwards)=Mead's "*Satyrus* 5" (letter 189, 194; in letter 220 Brown mistakenly says *Satyrus* 5 is *C. oetus*). One locality: Bailey & vicinity, 2 specimens found Aug. 26 & more the next week, none found a few miles on either side of this point, all worn so must appear the last of July.+None seen elsewhere.+Sometimes on flowers.+Egg described.+(Mead 1876). Bailey [Aug. 25-26] (letter 185), caught 49 [including the lectotype] here (Journal August 26). Bailey, found numbers of worn specimens [Aug. 24-26, Aug. 29-Sept. 1] (letter 189). Rearing efforts: Placed female in laying boxes to get eggs (Journal September 3), 2-3 eggs laid sent Sept. 7 from Kenosha House to Mr. [W. H.] Edwards (letter 194, Journal September 7), sent Sept. 11 female parent of the eggs earlier sent Sept. 7 from Kenosha House ~Sept. 2-11 (letter 199). **Type locality of *Erebia meadii* W. H. Edwards, 1872.** O.D. says "Found by Mr. Mead at Bailey's Ranch, in the South Park, Colorado, about 45 miles from Denver, during the last week of August 1871....Altogether 49 specimens were taken, a few of them perfect...They should be looked for about 1<sup>st</sup> of August." Lectotype has "*Meadii* female type Col<sup>o</sup>". Many specimens exist in CMNH in the Mead coll., so many probably have month and date. Mead (1876) and his Journal state he collected it there Aug. 26. All of Mead's 1871 specimens were coll. at **Bailey, Park Co. Colo.**, on Aug. 26 and later, so that is the TL.

*Cercyonis oetus charon* (W. Edwards)=Mead's "*Satyrus* 4" (letters 151, 185). Localities: Twin Lakes, near house just E of the eastern Twin Lake evidently owned by Mr. Derry (Journal July 9). Twin Lakes common flying about the sagebrush [July 9-18], I have taken 70 specimens (letter 151). First found Twin Lakes July 9[-18] quite abundant on sagebrush and on flowers at the edge of the lake.+Later both South [Fairplay July 24] and Middle Parks [Aug. 6-16] though less abundant.+Altogether 131 specimens taken.+Sometimes on flowers.+Eggs laid on grass, egg described.+(Mead 1876). Rearing efforts at Kenosha House: 3 females at Kenosha House put in laying box to get ovip. Aug. 27 (letter 185), caught 4 females and set them in laying boxes to get eggs (Journal August 27), only 5 eggs laid on side of box, sent from Kenosha House Sept. 2 (letter 189). **Type locality of *Satyrus charon* W. H. Edwards, 1872.** O.D. writes "This species was first met with by Mr. Mead, in Colorado, near the Twin Lakes, in Upper Arkansas Valley (elevation 8000 feet) in July 1871. By the latter part of July it was abundant throughout the entire [South] Park and mountain country and so continued til September." Mead (1876) says it was first caught near Twin Lakes July 9, later both in South and Middle Parks. Lectotype has only "*Charon* male type Col<sup>o</sup>". So the TL is everywhere Mead caught it: **Twin Lakes, Lake Co. Colo.; Fairplay and Kenosha House etc. Park Co. Colo.; Summit and Grand (Middle Park)**

**Cos. Colo.; and Jefferson Co. Colo.**, and there is no evidence lectotype was coll. July 9. Brown notes that a large number of Mead specimens exist in CMNH, which probably have month and date, but cannot contribute their data to the TL because of the pathetically-labeled lectotype.

*Erebia epipsodea* Butler=*rhodia* W. Edwards=Mead's "*Satyrus* 2" (letter 151)=Mead's "*Erebia* 2" (letter 152). Localities: Inhabits the mts. of Colorado below timberline [it actually also occurs a little above timberline], begins about the first week in June, common mid June, remains until last of July (Mead 1876). Beaver Creek, Fairplay July 6 (Journal July 6). Kenosha House (male in CMNH with clipping "*Satyrus* 2/ 6/29", Calhoun 2015b). Many specimens exist in CMNH in the Mead coll. so probably have month and date. Rearing effort: I will send laying boxes to Mr. Blair at Kenosha House to try to get eggs (letter 163 written July 26). **Type locality of *Erebia rhodia* W. H. Edwards, 1871.** O.D. says "From Colorado; from several specimens taken by Mr. Mead." Lectotype has "*Satyrus* 2 7-6" and evidently "T. L. Mead collection" labels. Mead coll. at **Beaver Creek N of Fairplay, Park Co. Colo.** on July 6, so that is the TL.

*Erebia callias* W. Edwards=Mead's "*Satyrus* 3"=*Satyrus* (Angelwing [these were not *Polygonia satyrus*]) 3" (letters 157, 158). Above timberline ~11000' replaces *E. epipsodea*, rarely below.+Quite abundant on bleak summits of the mts.+First specimens on Arkansas Divide [Mosquito Pass] July 8 six specimens, July 21 50 specimens.+Also found on Mt. Lincoln [July 22] and Gray's Peaks [actually Argentine Pass 13207' 2 mi. ESE Gray's Peak, Clear Creek/Summit Co. Colo. Aug. 5].+Mead (1876). Near peak summit [evidently 12600' 2.2 mi. NE Quail Mtn.] SW of Twin Lakes, July 10 (Mead 1876, letter 151, Journal July 10). Mosquito Pass "Snowy Range" above 11000' or a few hundred feet higher for an hour July 8, 5m (letter 151, Journal July 8). Mosquito Pass July 21, 4 specimens (letter 158 [maybe he meant to write 40]). Mosquito Pass July 21, many (Journal July 21). 12 paralectotypes in Mead collection in CMNH have labels "Sat 3 7-21" collected Mosquito Pass July 21. Specimen at 10000' [**error too low** as Leadville is 10152'] the lowest I have found, [Oro City, 2 mi SE Leadville, just SE Iron Hill] up the gulch & on mtn., July 20 (letter 157). [Argentine Pass 13207'] crossed the Atlantic/Pacific divide near [2 mi. ESE] Gray's Peak (Journal August 5). 70 specimens total taken (Mead 1876). 62 specimens total taken (Mead 1877). **Type locality of *Erebia callias* W. H. Edwards, 1871.** O.D. says "From Colorado; from several specimens taken by Mr. Mead." Lectotype has "*callias* male Col<sup>o</sup>". So the TL is the localities of all 70? of Mead's 1871 specimens: **Mosquito Pass, Lake-Park Co. Colo.; Oro City near Leadville, Lake Co. Colo.; Mt. Lincoln, Park Co. Colo.; peak 2.2 mi NE Quail Mtn. SW of Twin Lakes, Lake Co. Colo.; and Argentine Pass (which is 13207' 2 mi. E Gray's Peak), Clear Creek/Summit Co. Colo.** Mosquito Pass July 8 (Calhoun 2015a p. 13) is just a guess.

*Neominois ridingsii ridingsii* (W. Edwards). 3 localities: Near Denver [June 1 & 3] a few found.+A rare species about Turkey Creek [~June 21-27].+(Mead 1876). Very abundant in sage brush country about Twin Lakes 8000' July [9-18], rarely visits flowers (Mead 1876, letter 151).

*Oeneis uhleri uhleri* (Reakirt). Abundant in grassy spots in the lower mtn. regions of Colorado in June and July.+73 specimens taken.+[Obviously must have been found in Turkey Creek June 5-7 & June 21-27 where it is common, and along Hoosier Creek near Kenosha House June 14-19? and June 29-July 5 where it was common in 2015].+(Mead 1876).

*Oeneis calais altacordillera* Scott=Mead's "*Chionobas* 3" (letter 151). Mead evidently caught nearly all at higher altitudes, thus nearly all (at least all the ones from Mosquito Pass) must be *O. c. altacordillera* and not the true *Oeneis chryxus*. Museum specimens with data would have to be examined to properly identify any lower altitude specimens, if any still exist that did not succumb to Edwards' data destruction. Localities: Found in more elevated regions than *O. uhleri*, still keeping, as a rule, below timberline.+First specimens July 8 Arkansas Divide [Mosquito Pass 11 specimens] by the roadside.+Found in small numbers through all the



mountain region around South Park [Fairplay July 6{7}? and Kenosha House June 29-July 5?], rarely below 9000'.+None seen after July.+Egg described.+(Mead 1876). Top of ["Snowy"] Range [Mosquito Pass for an hour] plentiful abundant July 8, 5m (Journal July 8, letter 151). 25 specimens caught of two "alpine" *Chionobas* (Mead 1877)[so evidently 23 were *calais*].

*Oeneis melissa lucilla* Barnes & McDunnough=Mead's "Chionobas 4"="near *semidea*"

(Say)(letters 151, 180). Localities two alpine peaks S Twin Lakes: At Twin Lakes two specimens were taken and others seen at 13000 feet on a very steep mountain [peak 2.2 mi. NE Quail Mtn. 12600' SW of Twin Lakes July 10] (Mead 1876, letter 151). Alpine zone almost at the top of peak [the peak evidently 12400' 2.5 mi. E Quail Mtn.], S of Twin Lakes, July 12 one specimen (letter 151) saw one (Journal July 12).

*Limenitis weidemeyerii weidemeyerii* W. Edwards=Mead's "*Limenitis* 1" (letter 129). One locality. A specimen taken June 6 [in South Turkey Creek Can.], no more until 24<sup>th</sup> [also South Turkey Creek Can.].+By last of July the species has disappeared.+None more than 7500 or 8000'.+(Mead 1876). On willow shrub, during walk 8 miles down South Turkey Creek [to 1.5 mi. S of Tinytown] from Bradford Junction, June 6 (letter 129).

*Euptoieta claudia* (Cramer)=Mead's "*columbina*" (letters 142, 151, 163, 185). 53 total specimens were collected (Mead 1877). Localities: Abundant throughout the region.+In July [Kenosha House] eggs laid on *Sedum* [*lanceolatum*], almost every clump had one or several eggs.+Larva pupa described.+(Mead 1876). [Gulch N of Bradford Junction=head of North Turkey Creek] June 22, numerous "*Argynnis*" eggs on *Sedum lanceolatum* (letter 142). More rearing attempts: Kenosha House, found many *Euptoieta claudia* eggs on *Sedum lanceolatum* (Journal July 5, letter 151). Eggs I had were molded but I have another female to "set", Kenosha House July 26 (letter 163). Eggs Mr. Blair tended at Kenosha House hatched but died (letter 185 Aug. 27).

*Argynnis aphrodite whitehousei* Gunder=*ethne* Hemming. Mead (1876) wrote that *aphrodite* "occurs in Colorado, though is very rare.", which means that it was uncommon that year, or most likely that he misidentified it. A major mystery is why Mead did not report *A. aphrodite*, because it is common in the Front Range foothills, just as common or more common than *A. hesperis*. It is silvered, so some of Mead's "*Hesperis*" and "*Hesperia*(fritillary)" and some "*Argynnis* 6" may be *aphrodite*. But instead of guessing and messing up Mead's *A. hesperis* names I will just add *aphrodite* to the list coll. in Turkey Creek/Bradford Junction overall (June 21-27, July 29), without changing the individual "*Hesperis*/*Argynnis* #6/*Hesperia* (fritillary)" records. Journal Feb. 9 says that Mead "Packed up two male *Aphrodites* and mailed them to J. R. Muhleman Woodburn Co. Ill. as requested by Mr. Edwards.", which suggests that maybe Mead learned how to recognize *aphrodite* from looking at those two specimens, but Colo. ones differ somewhat, and maybe he forgot how to identify it.

*Argynnis mormonia eurynome* W. Edwards=Mead's "*Argynnis* 9" (letters 157, 191, 199, Brown wrongly stated "unknown" at earlier letter 152)=Mead's "*Astarte* 9" (explained by Edwards Trans. Amer. Ent. Soc. 4:66, 1872); unsilvered specimen=Mead's "*Argynnis* #10" (letter 157).

Localities collected: up Beaver Creek from Fairplay, 7 specimens, July 6 (letter 151).

Unsilvered specimen Oro City [2 mi SE Leadville, just SE Iron Hill] up California Gulch & on mtn. July 20 (letter 157, Mead 1876). All parts of South Park [Fairplay July 6{7}], on continental divide [Mosquito Pass, July 8, 21], and Middle Park [Aug. 6-16] (Mead 1876).

Rearing efforts: 25 eggs [probably laid by female from Kenosha House ~Aug. 27] laid on violets sent, Kenosha House, Sept. 2 (letter 191). Put another female from Kenosha House in laying boxes to get eggs (Journal September 3), she had laid some eggs in laying box (Journal September 4), those eggs sent from Kenosha House Sept. 11 (letter 199). **Type locality of *Argynnis eurynome* W. H. Edwards, 1872.** O.D. says only "Mr. Mead found this species common throughout Colorado....Among a large number taken by Mr. Mead, one male was

without silver, the spots being clear yellow” [the Oro City specimen]. Lectotype label has “*Eurynome* male Col<sup>o</sup>”. No other specimens have month/date. So the June 6 locality of Calhoun (2015a p. 13) is just a guess, and valid TL is everywhere Mead found the bug: **Beaver Creek/Fairplay and Kenosha House in Park Co. Colo.; Mosquito Pass Park/Lake Cos. Colo.; Oro City/California Gulch, Lake Co. Colo.; Middle Park in Summit and Grand Cos. Colo.**

*Argynnis callippe meadii* W. Edwards=Mead’s “*Argynnis* 3” (letters 129, 180). Only one specimen was caught. Mead (1876) says he caught it at Turkey Creek Junction on June 6, and letter 129 says he caught it at a moist spot in road on walk 8 miles down South Turkey Creek E from Bradford Junction (16 miles round trip—he got within 1.5 mi. S of Tintytown) (also Journal June 6, & Calhoun {2015a p. 12, 25-26}), so he caught it in South Turkey Creek Canyon. **Type locality of *Argynnis meadii* W. H. Edwards, 1872.** O.D. says “brought to notice by Mr. Mead, who took a single male in perfect condition at Turkey Creek Junction [actually South Turkey Creek Canyon], in Colorado in 1871.” Lectotype lacks locality and date and label says only “*Meadii* type returned to T. L. [Mead]”. Mead (1876) says he caught it at Turkey Creek Junction on June 6, and letter 129 says he caught it at a moist spot in road on walk 8 miles down South Turkey Creek from Bradford Junction. No others have month/date. So the TL is **South Turkey Creek Canyon 7500’, Jefferson Co. Colo. June 6.**

*Argynnis hesperis* W. Edwards: Identity of Mead’s “*Halcyone*”/”*Halcyon*” [spelled *Halcyon* rather than *Halcyone* in letters 157, 158, 177, 189, 194, 207)] and “*Hesperis*/#6” and *Argynnis* #6 and “*Hesperia* (fritillary)”. The identity of most of Mead’s “*Halcyone*/*Halcyon*” names that he used during his trip has been determined (after his trip {in Mead 1876} Mead used the names for different taxa, more like today’s usages). Both refer to *A. hesperis hesperis*, but *Halcyone*/*Halcyon* refers to unsilvered *A. h. hesperis*, while *Hesperis* and *Argynnis* #6 and “*Hesperia* (fritillary)” refer to slightly-silvered to mostly-silvered *A. h. hesperis*, the opposite of the correct (unsilvered) usage of the name *hesperis*. (The unsilvered names are mentioned in letters 148, 157, 158, 177, 189, 194, 207, and journal entries June 24-25-26-27, July 28-29, Sept. 3, 7. The silvered names are mentioned in letters 148, 157, 177, 189, 207, and journal entries July 28-29). Journal entry June 25 says “walked along the road, catching a male *Halcyone* and 2 males of another species which differs in having the usual spots silvery instead of yellow.”, which indicates that *halcyone* is unsilvered. Also, letter 157 [written July 20] says “The only novelty of today is *Argynnis* (Fritillary) 10, one specimen in the box. It is much the same as No. 9 but lacks the silvering, just as *Halcyon* differs from No. 6.” #10 unsilvered and #9 silvered are both *A. mormonia eurynome*, thus Mead’s “*Halcyone*=”*Halcyon*” is *A. h. hesperis* unsilvered, and Mead’s “*Hesperis*” #6 is *A. h. hesperis* somewhat silvered. Letter 148 written June 29 says *Argynnis* 6 [*Argynnis atlantis hesperis* noted Brown] is found in about the same localities [as *Halcyone*].” which is true because they are the same species. Letter 158 says on July 7 Mead received from W. H. Edwards a plate of *A. hesperis hesperis* (unsilvered) from Edwards’ Butterflies of North America book [which Edwards sent to educate Mead about the proper usage of the name *hesperis* because Mead had used opposite incorrect usages], and wrote to Edwards “I am sorry about my mistakes about *Hesperis* etc but it is very difficult to recollect an insect known only from a plate for a long time.” and wrote that he mixed up different species under the same number (like he confused *A. coronis halcyone* with *S. hesperis*) because he had to work and paper the butterflies at night in a room lit by fireplace with miners talking loudly and complaining about bedbugs tramping and crowing at night. This explains why Mead used the names for the opposite of what is shown on Edwards’ plate and opposite the usages we use today. But Mead evidently did not change his usages for these names after he received Edwards’ plate, as on Journal July 29 (and vague letter 177) he reported several *Halcyone* and only one

*Hesperis* at Turkey Creek, which is the natural proportion found there (part-silvered specimens are uncommon and completely-silvered ones are very rare). Mead might have caught some true *A. coronis halcyone*, but it is usually uncommon in Colorado, and Mead (1876, after seeing Edwards' identifications) says he caught just a few elsewhere, at the southern end of South Park including near Cañon City Sept. 20. Some of these records—the silvered *Hesperis* in particular—may have been misidentified silvered *A. aphrodite* or silvered *A. atlantis sorocko*.

But these unsilvered and silvered identities for Mead's names are applied here: ***A. hesperis***

***hesperis* (unsilvered) localities:** Found on mud at Turkey Creek June 24 (Journal June 24, letter 148). Tributary rivulet of North Turkey Creek due S of Bradford Junction June 25 found 1 male (this and *A. atlantis sorocko*? [2m caught], the total combination numerous) (Journal June 25, letter 148). 1 mile north of Bradford Junction then west up a small brook (1.5 mi. WSW Berrian Mtn.) June 26 found lots of "&c" (Journal June 26). Same location June 27 found one *A.*

*hesperis* unsilvered (Journal June 27). Up a gulch (near Pine Jct. evidently, Jefferson/Park Co. line) July 28, got some *A. hesperis hesperis* unsilvered (Journal July 28). ENE to South Turkey Creek July 29 found several (Journal July 29, letter 177). Mead (1876) wrote that "*A. hesperis*"

[evidently unsilvered] is found sparingly near Fairplay [July 6{7}?], and "not far from the Middle Park, on the Georgetown Road" [evidently near Idaho Springs Aug. 19]. *Argynnis*

*hesperis* unsilvered **rearing attempts:** At Kenosha House, placed female (evidently caught at Bailey Aug. 24-26 or 29-Sept. 1) in laying box to get eggs (Journal September 3); female only laid one egg but found one more egg, sent Sept. 7 to Mr. [W. H.] Edwards from Kenosha House (letter 194, Journal September 7). ***A. hesperis hesperis* part-silvered localities:** [For "*atlantis*"

7500' in latter part of June [Turkey Creek, June 21-27], males visit mud, both sexes visit *Monarda*; in Platte Valley [evidently in July, as Mead didn't collect there in late June] (Mead 1876). Tributary rivulet of North Turkey Creek due S of Bradford Junction June 25 found 2m silvered [which might be *A. hesperis* part silvered but below I suggest they maybe were *A.*

*atlantis sorocko*--this and unsilvered ones {1m caught} were numerous in total] (Journal June 25, letter 148). Up a gulch near Pine Jct. evidently, Jefferson/Park Co. line July 28, got some *A. hesperis hesperis* part-silvered [maybe some *sorocko*?] (Journal July 28). ENE to South Turkey Creek July 29 found one (Journal July 29, letter 177). ***Argynnis hesperis* rearing:** eggs from

female sent from Kenosha House Sept. 2 (letter 189). **Type locality of *Argynnis hesperis***

**Edwards, 1864.** The neotype has only "Hesperis male type Colo" written by Edwards. Brown (1964-1987 91:298-301) figured the neotype, which might have been collected by Mead in 1871 in the Colorado Front Range but Edwards threw away the data so that is uncertain. dos Passos & Grey designated it as lectotype and suggested the TL was Turkey Creek Junction Colorado because Mead collected specimens there, but that is uncertain, and the collector is unknown. The name was established 7 years before Mead could have collected it, so Brown called it a neotype as it was doubtfully a syntype. So, **TL is Colorado Front Range, maybe Turkey Creek.**

***Argynnis hesperis electa* W. Edwards.** As noted above, in the Front Range of Colorado, nearly all specimens of *A. hesperis hesperis* are unsilvered, but many of them are partly silvered (Scott 1988), and completely silvered adults are rare, only about 1% in the foothills. This changes at high altitude near the continental divide (such as E Portal of Moffat Tunnel in Gilpin Co. and Eisenhower Tunnel in Clear Creek Co.), where most are silvered like the W slope *A. hesperis electa*. Mead collected some mostly-silvered ones, probably especially at Fairplay, and Mead (1876) recorded one "*hesperis*" from Twin Lakes in Lake Co. which is *A. hesperis electa*. Note that the lectotype of *electa* (fig. by Brown 1964-1987 91:307) has dark ups wing bases and broad ups postmedian black bars and silver spots typical of W Colorado *electa*, whereas *A. hesperis hesperis* from the Front Range has less-dark ups bases and narrower black bars and usually-unsilvered spots, thus the *electa* lectotype is a good representative of the W Colo. ssp. (formerly

called “*nikias*” by L. Paul Grey) and thus seems to have come from W Colo. and not the Front Range. Thus Scott et al. (1998) used wing pattern and history to properly correct the TL of the *electa* lectotype to Twin Lakes, Lake Co. Colorado, where the silvered ssp. occurs. ***A. hesperis electa* localities.** [As “*Atlantis*”] “taken at 8000’...July...in Arkansas Valley” [at Twin Lakes, actually 9200’, from E side of the E lake to westward 6 miles around the lakes, and up the mts. to the south, July 9-18] (Mead 1876). (The *electa* lectotype was stated to be from Twin Lakes [July 9-18] by Scott et al. 1998 (Calhoun 2015a p. 13 also notes this). **Type locality of *Argynnis electa* W. H. Edwards, 1878.** Lectotype has three labels “*Electa* male Colo Mead 71”, “Collection W. H. Edwards”, and “*Argynnis cornelia* male Fide W. J. Holland”. The O.D. wrote “From 12m4f received from Colorado. Several of these were taken in the north of that State by Mr. Mead in 1871, and I have until recently been undecided respecting them, but others, fresh and uninjured specimens, received from Mr. Morrison, and taken in the South in 1877, leaves no doubt on my mind as to the distinctness of this species.” O.D. described the ups as “reddish-fulvous, but little obscured at base” with “black bars “as in *Atlantis* and allied species, but slight”, and described the unh spots as “sometimes well silvered, sometimes imperfectly, and in this last case are buff more or less dusted with silver”, thus describes Front Range ssp. *hesperis* butterflies well, except for not mentioning that Front Range butterflies are mostly unsilvered and only ~1% are fully silvered in the foothills and the frequency becomes higher with altitude, so in that silvering feature it also described the W Colo. butterflies which is a different subspecies later named *nikias*. Thus the original description fits TWO subspecies. Brown noted that Barnes & McDunnough (1916) designated the lectotype of the Mead 1871 specimen figured by Brown, which has dark ups bases and wide postmedian black bars and silvered unh thus matches the W Colo. darker/silvered *nikias* ssp. not the Front Range mostly-unsilvered ssp., then Scott et al. 2008 corrected the TL to **Twin Lakes, Lake Co. Colo.** based on BOTH the dark-ups thicker-bars silvered *nikias* phenotype of the lectotype and on Mead’s travels in 1871. Ssp. *electa* was not recorded by Mead from Summit or Grand Counties so the TL is evidently not from there, and has to be Twin Lakes because that is the only place he collected that has that *nikias* phenotype. Mead collected TWO subspecies, ssp. *hesperis* eastward, and ssp. *electa* at Twin Lakes. Scott et al (2008) replaced the name *nikias* by *electa*; in retrospect, they could have submitted a petition to ICZN to preserve the name *nikias* to avoid name changes because the name *electa* had been used for the Front Range bugs, but petitions are a big bother and it takes time for people to learn how to write successful petitions.

***Argynnis atlantis sorocko* (Scott, Kondla, & Spomer).** Scott et al. (2008) also named *A. atlantis sorocko*, which occurs in the higher Front Range and is always completely silvered. It is rare--absent most years--in South Turkey Creek Canyon at Tintown, but at Bradford Junction at higher altitude it should be a little more common, and some of the specimens Mead caught from Kenosha House and Fairplay etc. could be *A. a. sorocko*. The O.D. of *A. hesperis electa* described some “well silvered” adults, which could be rare silvered *A. hesperis hesperis*, which becomes more silvered at high altitude near the western slope, or could be *A. atlantis sorocko*. An expert on *Argynnis* identification will have to identify those museum specimens to find any *sorocko*. Journal June 25 Sunday [Bradford Junction] says walked along the road [“along the road” is a new phrase, so maybe he walked south on the South Park-Denver road, as he would have wanted to go that way at least once], catching a male *Halcyone* [*A. hesperis hesperis* unsilvered] and 2m of another species which differs in having the usual spots silvery instead of yellow [probably partly-silvered *A. hesperis*, but maybe an *Argynnis atlantis sorocko* which should occur here and is always fully silvered]. If those two were completely silvered then they were probably *sorocko*, as it would be very rare to catch two mostly-silvered *A. hesperis hesperis* on one day at that site. ***A. atlantis sorocko* possible localities.** 2 males caught tributary rivulet

of North Turkey Creek due S of Bradford Junction [a more meadowy area more likely to have *sorocko*, as it prefers meadowy areas while *hesperis* prefers woods][evidence of location: After dinner {lunch} walked along the road {"along the road" is a new phrase, so maybe he walked south on the South Park-Denver road, as he would have wanted to go that way at least once, plus letter 148 says the day after the July 24 horsefly bite he "followed up a little rivulet on the mountainside" which fits the intermittent tributary of North Turkey Creek that flows north from Conifer, as located on most maps including the Conifer 7.5 minute topo map} to Bradford Junction] June 25 (this and *A. hesperis hesperis* unsilvered [1m caught] were numerous in total) (Journal June 25, letter 148). Of course, an expert on *Argynnis* identification would have to examine museum specimens to properly identify them.

*Argynnis coronis halcyone* W. Edwards. ["*halcyone*" evidently the real *coronis halcyone*] Found here and there toward the southern border of the South Park, Colorado.+A worn female probably of this species taken near Cañon City Sept. 20.+(Mead 1876). Mead evidently learned after his trip that most of his "*halcyone*" were not *A. coronis halcyone*. [Evidently all or nearly all other records of "*halcyone/halcyon*" in Mead's letters and journal were *A. hesperis hesperis* unsilvered, as discussed above.] But he may have collected some specimens of *coronis* at Turkey Creek, where it is uncommon.

*Argynnis edwardsii* Reakirt (Mead's "*Argynnis* 1" is the male {letter 122}; "*Argynnis* 2" is the female {letter 122}). Two localities: Mead perceptively describes adult diapause: Near Denver on banks of South Platte R. June 1.+Found at all elevations up to timberline, until late Aug.+Becomes scarce after first appearance, reappears in August, the females seeming fresh and lay eggs and finally disappear when killed by frosts, the males old and worn.+(letter 122, Mead 1876). Kenosha House caught a few (Journal August 26).

*Boloria eunomia caelestis* (Hemming)=Mead's "*Argynnis* 7" (letters 148, 151, it is not *eurynome*). Three localities collected: Near Kenosha House, went up the second large gulch on the right hand side of the creek [evidently W up Hoosier Creek 2 miles then N up little open valley leading to Dake Lake=Lininger Lake] & found a new *Argynnis* [*eunomia*] June 29 (Journal June 29) (letter 148) [Letter 151 describes typical habitat shrub-willow-low bush fen "flat mossy willow bog" [near Kenosha House]; in 2015 this valley and Hoosier Creek looked like rather poor *Boloria* habitat with hundreds of *Potentilla fruticosa* bushes and some smaller and larger *Salix* bushes and much *Carex* so *B. eunomia* and *B. frigga* are very doubtfully current residents, though one *Boloria* {*titania*?} was seen, but the habitat was probably better in 1871 before a ditch was dug to Dake Lake that ran more water down to Hoosier Creek and before the beaver were probably exterminated by trappers—the beaver are now back and a sign says the wetland habitat is being restored], about a dozen caught [Kenosha House June 29-July 5] (letter 148). Kenosha House. Went farther up same gulch as yesterday and found 40 specimens of another new *Argynnis* [*Boloria eunomia* by elimination of all others using Mead 1876]. June 30 Journal. First specimens near Kenosha House June 29 [up to July 5], but more abundant near Fairplay [July 6{7}].+Last specimen Twin Lakes [6 miles up Lake Creek, west of the lakes] July 14.+(Mead 1876). Common up Beaver Creek [near Fairplay] July 6 (letter 151).

*Boloria selene tollandensis* (Barnes & Benjamin)=Mead's "*Argynnis* 11" (letter 177). Locality: [Dillon=Snake River near Silverthorne], August 6 (Journal Aug. 6, Mead 1876), caught 6 or 7 silvered specimens Aug. 6 (letter 177). [Dillon], one, August 7 (Journal Aug. 7).

*Boloria bellona bellona* (Fabricius)=Mead's "*Nenoquis*" (Mead marked the triangle of the single specimen "*Argynnis* 5" but in letter 177 wrote it is NOT that) Locality: A single specimen near Hot [Sulphur] Springs, Middle Park, Aug. 14 (Mead 1876; at the Hot Springs, letter 177).

*Boloria frigga sagata* (Barnes & Benjamin)=Mead's "*Argynnis* 5" (letter 148, 177). Two localities: Kenosha House [evidently valley up Hoosier Creek and little valley leading to Dake=Lininger

Lake according to June 14 Journal][June 14-19], so far found 20 specimens, flies 1-2 weeks later than *B. freija* along beds of mountain streams where they widen and are overgrown with dwarf willows {lower down near Kenosha House, the Hoosier Creek valley just has larger *Salix* bushes along the creek and hundreds of *Potentilla fruticosa* bushes and lacks the fen *Boloria*} gone by June 29, (letter 148). Letter 151 describes a typical habitat shrub-willow-low bush fen flat mossy “willow bog”. Both found Beaver Creek near Fairplay [June 9-12], and near the Kenosha House, 9000’ [June 14-19], same localities and habits as *freija* but 1-2 weeks later, disappearing about last of June (Mead 1876). The habitat along Hoosier Creek is poor now, so the butterfly is doubtfully present.

*Boloria freija browni* (Higgins)=Mead’s “*Argynnis* 4” (letter 148). Two localities: Kenosha House [evidently valleys up Hoosier Creek and little valley leading to Dake Lake June 14-19 {and Scott found it in valley just N Kenosha Pass}], so far found 36 specimens, found along beds of mountain streams where they widen and are overgrown with dwarf willows, gone by June 29, (letter 148 and Mead 1876 in the “*epithore*” paragraph). Beaver Creek near Fairplay June 9-12 (Mead 1876 + in “*epithore*” paragraph). Letter 151 describes typical habitat shrub-willow-low bush fen flat mossy “willow bog” [near Kenosha House].

*Boloria titania helena* (W. Edwards)=Mead’s “*Argynnis* 8” (letters 148, 151). Localities: Mtn. [12600’ 2.2 mi. NE Quail Mtn., south of the Twin Lakes] Near the summit found swarms of *Argynnis* 8=*titania* {though many of the ones he saw may have been *Euphydryas anicia brucei* which hilltops and was underreported by Mead} July 10 (Journal July 10, letters 151, 153). Paratype female July 10 [walked up mtn. S Twin Lakes], PMNH butterfliesofamerica.com. [Kenosha House June 29-July 5] farther up and more in the mountains it is abundant, I have about 50 specimens (letter 148). [Kenosha House, down Kenosha Gulch 4 miles] July 3, paratype male PMNH butterfliesofamerica.com. Inhabits the highest peaks, throughout all parts of the “Snowy Range” [now Mosquito Range, including Mosquito Pass & Mt. Lincoln] visited.+Often more abundant at 13000 and 14000’ than below.+Specimens found until the first of August.+[Some may be *Euphydryas anicia brucei*?]+(Mead 1876). NOT yet seen up Beaver Creek July 6 (letter 151). California Gulch.+Walked up the gulch and on the mountains.+Found another *Argynnis* [evidently *helena*] (Journal July 20). Swarms on many of the peaks (Mead 1877)[some are *brucei*?]. Five Mead paralectotypes in CMNH have 7-20 [California Gulch E up mts.] or 7-21 [Mosquito Pass] labels. **Type locality of *Argynnis helena* W. H. Edwards, 1871.** O.D. says “Taken by Mr. Mead in Colorado.” Lectotype has only Col<sup>o</sup> 71. The TL is locality of lectotype, thus is everywhere he collected them in Colo., although many of the Twin Lakes specimens he saw may be misidentified. So the TL is everywhere Mead collected *helena* in Colo.: **California Gulch, Lake Co.; Mosquito Pass, Lake/Park Co.; mts. S of Twin Lakes, Lake Co.; Mt. Lincoln, Park Co.; Kenosha House, Park Co.** The TL given by Calhoun (2015a p. 14) of California Gulch E of Leadville is just a guess.

*Vanessa virginiensis* (Drury). Two possible localities: Not common, one or two taken about middle of June [Kenosha House? June 14-19], and also later in the season in Colorado (Mead 1876). Specimen on spreading board [locality unstated probably Bailey based on Journal Sept. 1 where he made spreading board] (package sent Sept. 8 from Kenosha House to Mr. Joseph Bailey Deer Valley CO, letter 197).

*Vanessa cardui cardui* (Linnaeus). Here and there not common in Colorado (Mead 1876). No specific localities.

*Vanessa carye annabella* (Field). Abundant in California even on streets of San Francisco (Mead 1876). Abundant in San Francisco [Oct. 7-11] (letters 215, 220).

*Vanessa atalanta rubria* (Fruhstorfer). Met with now and then, wherever nettles were abundant [Colorado? Denver June 1?] (Mead 1876).

*Aglaia milberti* (Godart)=Mead's "*Vanessa* 1" (letters 122, 148). Larvae on *Urtica dioica gracilis* in a common web over top of a nettle shoot, larvae solitary after half grown in a leaf bent upwards, in waste places on outskirts of Denver near Platte River June 1 (letter 122), almost every nettle had many larvae and females were laying eggs.+Some larvae reared, adults emerging in early July.+Found throughout the mts. in considerable numbers.+(Mead 1876). July 3 some eggs from Denver have "hatched" [from pupae] and emerged as *milberti* (letter 148). Denver male in MCZ has clipping "Vanessa 1 bred 7-6" (emerged July 6) (Calhoun 2015b).

*Nymphalis californica timidar* Scott & Kondla=Mead's "handsome *Vanessa*" (letter 148). 1 ½ miles [ENE to South Turkey Creek] Journal June 23. 3 or 4 seen all near Turkey Creek toward last of June [June 21-27] (Mead 1876, letter 148).

*Nymphalis antiopa* (Linnaeus)="Vanessa *antiopa*". Two localities: Specimen on spreading board [locality unstated probably Bailey where he made spreading board based on Journal Sept. 1] (package sent Sept. 8 to Mr. Joseph Bailey Deer Valley CO, letter 197). Mr. Blair was trying to get eggs at Kenosha House, Aug. 26 (letter 185). Seen here and there through the mtn. region, not common (Mead 1876).

*Polygonia satyrus satyrus* (W. Edwards). A single specimen Turkey Creek Junction [walk E to South Turkey Creek] June 24, no others seen (Mead 1876; Journal June 24).

*Polygonia gracilis zephyrus* (W. Edwards). "Four localities: By far the most abundant species in Colorado; first seen Turkey Creek 7500' June 5; N of Berthoud Pass, Aug. 16, a few seen; [Grant or Shawnee on South Park Road] Aug. 28 many found.+25 caught in June, scarcely any seen in July, 30 in August.+(Mead 1876). On 28<sup>th</sup> ~20 miles [more like 15] from South Park on South Park Road many found (Mead 1876); at same locality [Walked early {too early for butterflies} from Kenosha House to near Shawnee, which is W of Bailey and 12 mi from Kenosha House] found many [near Shawnee] August 28 (Journal August 28). Specimen on spreading board [locality unstated probably Bailey based on Journal Sept. 1 where he made spreading board] (package sent Sept. 8 to Mr. Joseph Bailey Deer Valley CO, letter 197).

*Polygonia faunus hylas* (W. Edwards)=Mead's "*Grapta* 3" (letter 220). Two localities: Just N of Berthoud Pass, 15 specimens [including lectotype] Aug. 16 (Mead 1876, Journal August 16, letter 177). On 28<sup>th</sup> ~20 miles [more like 15] from South Park on South Park Road a few more found (Mead 1876); at same locality [walked early {too early for butterflies} from Kenosha House to near Shawnee, which is W of Bailey and 12 mi from Kenosha House] "pocket" of over 20 specimens [near Shawnee] August 28 (Journal August 28). 2 paralectotype males in CMNH have labels identical to those of lectotype, and a male paralectotype in CMNH is labeled *Grapta* 3/Aug. 28 thus is also from Shawnee, Park Co. Colo. Aug. 28. **Type locality of *Grapta hylas* W. H. Edwards, 1872.** O.D. says "From about 20 specimens taken in Colorado, in August 1871, by Mr. Mead." Lectotype is labeled "Colorado *Grapta* 3 8-16 Mead Coll<sup>n</sup>", and Journal Aug. 16 and letter 177 document that date and locale, thus TL is **just N Berthoud Pass, Grand Co. Colo.** Aug. 16.

*Junonia coenia* Hübner. ~Chinese Camp just W Yosemite [Calif.] one specimen (Journal October 23).

*Euphydryas anicia brucei* (W. Edwards). Mead lumped *Euphydryas anicia brucei* (the alpine butterfly that is small and darker on average) with *eurytion*, so he failed to give specific localities for *brucei*. He reported "*Melitaea nubigena*" Behr [misidentified, mostly *brucei* but some refer to *eurytion*=*carolae* treated below] "quite common throughout the mountain district of Colorado, in June and July." (Mead 1876). Based on this, Mead may have found *brucei* on the two alpine zone peaks he climbed S of Twin Lakes (July 10 & 12), on Mosquito Pass July 8 & 21, on Mt. Lincoln July 22, and Argentine Pass Aug. 5.

*Euphydryas anicia capella* (Barnes). Localities: One specimen “*chalcedona*” (blackish aberration?), Turkey Creek Junction [probably June 21-27] (Mead 1876). On walk down the road (journal June 21) [2 mi. E of Bradford Junction] “Yesterday [June 21] I took another species of *Melitaea* of the same size as No. 1 but without any yellow spots” [*capella*] (letter 142). On walk down the road (journal June 23) [1 ½ mi. E of Bradford Junction] June 23 1m *capella* CMNH (Calhoun 2015a p. 29). 1m no locality or date in CAS fig. by Wright (Calhoun 2015a p. 29). “MELITAEA EURYTION, Edw.+*Melitaea Eurytion*, Edw., MS.+This species is found associated with *Nubigena* in Colorado, but is much rarer, and does not seem to range to quite so great elevations.+The most obvious point of distinction from *Nubigena* is that the yellow spots of the latter are largely obscured in *Eurytion* by fulvous.”+(Mead 1876)—we now realize that this statement describing the lower altitude and absence of yellow spots fits *capella* best, see the type locality of *eurytion* below.

*Euphydryas anicia eurytion* (Holland, 1931)=Mead’s *Melitaea* 1” (Calhoun 2015a fig. 18)=Mead’s “*Melitaea* 6” white larva=Mead’s (1876) taxon “*nubigena*”. Localities: “quite common throughout the mountain district of Colorado, in June and July”.+(Mead, 1876). Lectotype labeled 7/4 [July 4 Kenosha House, in the valley just N along Hoosier Creek] (Calhoun 2015a p. 13 fig. 18), 12 paralectotypes in CMNH June 14 [Hoosier Creek N of Kenosha House] to July 2 [just S Kenosha House]; paralectotype female PMNH labeled July 2 [just S of Kenosha House] & paralectotype female July 4 (Calhoun 2015a 69:28)[July 4 Kenosha House, but could be **mislabelled** because only these two specimens and a *Phyciodes pulchella camillus* are known from that date and journal July 4 has no indication he collected butterflies that day]; 3 specimens near Fairplay [date evidently on label but not listed by Calhoun 2015a p. 26] CMNH; 1 specimen Twin Lakes [date evidently on label but not listed by Calhoun p. 26, the specimen **mislabelled** as the phenotype is not known from the Arkansas Valley there, it might have been collected on the peaks to the SW if it is a misidentified ssp. *brucei*] CMNH (Calhoun 2015a p. 26). **Adult variation.** Hundreds of collected/reared adults prove that adults do not differ in appearance at 6 known sites from S of Fairplay (TL of *carolae*) to near Red Hill Ranch to Como to Michigan Hill to Kenosha Pass to Hoosier Creek, and Don Eff’s series of creamier-ups adults from Como in Univ. Colorado museum is just a biased series of creamier variants he mounted from many adults caught at the normal population there (creamier-ups adults are frequent in the same proportion at all those sites). **Larvae.** Have larvae (one pupated) found in “South Park” [at Fairplay June 9-12 evidently] (letter 142 sent June 22). White pupae [from larvae from Kenosha House June 14-19 evidently] sent to Edwards July 7, larva is white (letter 151). Several larvae were found, usually near the ground, concealed in the herbage or on the stems of their food plant, an indigenous species of “*Plantago*” [obviously *Besseyia plantaginacea*, as Scott and Fisher found larvae on *B. plantaginacea* at Kenosha House in 2015, and *eurytion* is known at 5 sites on the flats of South Park and Scott found it on *B. plantaginacea* in South Park in 2015, and Frank Stermitz found it in lowland South Park at two other localities on *B. plantaginacea* {occasionally on *Castilleja integra* at one of the two sites}][Stermitz’ “Red Hill” locality was on the floor of South Park and not on Red Hill Pass where Scott found 1m *brucei*].+The ground color of these larvae is white, slightly marbled with black; the head is black, bilobed, hairy.+On the second segment is a black, collar-like mark.+Each of the succeeding segments, except the last, bears seven black spines, finely bristled.+The bases of the dorsal row yellowish; those of the adjacent rows black, and so on, alternating.+Length, 1 inch.+One larva suspended itself June 19, and became a chrysalis the next day.+Pupa whitish-gray, marked with black and yellow dots, much as in *Phaeton*.+Unfortunately, none of the specimens reached maturity” +[mostly Kenosha House June 14-19](Mead 1876). The white body color Mead described is true of all ssp. *eurytion* and ssp. *capella* older larvae, although they vary a little so the body color has almost no



black in some and in a few *eurytion* the subdorsal black scoli are connected into a moderate black band, whereas *E. bernadetta rorina* Scott & Fisher has larva with mostly blackish ground color and has wide black & white stripes at Veedauwoo in S Wyoming (Steven Spomer photo, see photos below) and NW Nebraska ssp. *bernadetta* is striped the same as *rorina*, whereas *brucei* and *E. a. wecoeut* Fisher, Spomer & Scott have very black larvae. Mead's larva was not *Poladryas minuta arachne*, which has white body with black stripes and black middorsal scoli and orange subdorsal scoli and orangish head. **Type locality of *Melitaea eurytion* Holland 1931 (not T. L. Mead, 1876).** Lectotype in CMNH (a Mead specimen with dubious 7/4 label and "Collection T. L. Mead" label) designated by Calhoun (2015a p. 26-29) was evidently collected in **Valley of Hoosier Creek just NW of Kenosha House** (where adults occur, Calhoun {2015a p. 26} and where Scott & M. Fisher collected adults and larvae in 2015), on July 4[maybe July 3 or 5?], so that is the TL. However, in addition to the dubious 7/4 label, this case is a total nest of worms. According to current dogma (Calhoun 2015a, Pelham 2008 etc.), Mead (1876) named the taxon *eurytion*, even though Mead himself wrote that the name *eurytion* was just a name in a W. H. Edwards manuscript. However, we now know (the present paper) that Mead's (1876) *eurytion* paragraph applies best to the current ssp. *capella*, because: #1 Mead wrote that it occurs at lower altitudes than his *nubigena* [which refers to the South Park butterflies later named *carolae*, as Calhoun 2015a also wrote], as *capella* does; and #2 Mead reported that it lacks yellow spots (Mead's statement that the yellow spots in *eurytion* are largely replaced by fulvous fits most *capella* and fits few *carolae* or *brucei*); and #3 Mead listed his *eurytion* after his *nubigena* (Mead used the name *nubigena* because specimens were sent by W. H. Edwards to Henry Edwards who misdetermined them as *E. editha nubigena* Behr a California butterfly, and Mead's taxon "*nubigena*" referred to a combination of the current ssp. *carolae* T. Emmel & Harris and *brucei*), thus common sense indicates that Mead's name *eurytion* does not refer to *carolae*; and #4 Mead collected two *capella* specimens on walks to South Turkey Creek on June 21 (a specimen without any yellow spots, letter 142) and June 23 (Calhoun 2015a p. 29) as noted above under *capella*. Therefore, because we now know that Mead's *eurytion* paragraph refers to *capella* not to *carolae*, if *eurytion* (Mead) is a validly-established name, then *capella* (Barnes, 1897) is a synonym of *eurytion*, and *carolae* is the valid name for South Park-Kenosha House butterflies, and Calhoun's designation of a lectotype of *eurytion* using a specimen of *carolae* is therefore invalid because that lectotype belongs to a different taxon (*carolae*) than Mead's original name *eurytion* (which is synonymous with *capella*). A lectotype must be a specimen of the taxon defined in the original publication, according to the Code and proper taxonomic practice. But this is the Old Name Sewer, and the nest of worms grows larger: The lectotype and Holland's female of *eurytion* look like some variants of *capella*, and look like some South Park/Hoosier Pass *carolae* but most of those *carolae* are slightly to mostly creamier on ups; so the subspecies identity of that lectotype is somewhat dubious (the somewhat-dubious July 4 date suggests it came from Hoosier Creek, a *carolae* site). Also, at Mead's 1876 time, the current assignment of the *eurytion* name to the *capella* taxon was not entirely clear, because Mead's statement that *eurytion* does not range to as high altitude as *nubigena*, was confused somewhat by his lumping of high-altitude *brucei* into his "*nubigena*" species (thus *carolae* and *capella* are both lower altitude than *brucei*), and some adults of *carolae* and *brucei* are orangish with little yellow spotting so resemble *capella*, so the yellower trait was somewhat variable, and his letter 142 might have referred to catching a *Poladryas minuta arachne* which always lacks yellow spots and was caught at Turkey Creek by Mead (but *arachne* looks quite different). (It is clear that Mead's "*nubigena*" taxon referred to South Park/Kenosha House plus alpine zone *brucei* butterflies, as Calhoun 2015a wrote also.) Thus Mead's paragraph in 1876 seems to be a nomen dubium. The **solution** to this mess is just that: The name *Melitaea eurytion* Mead IS a

nomen dubium. Noone at that time considered the name *eurytion* to be validly published by Mead. Other authors in the 1800s refused to use the name *eurytion*, including Herman Strecker who wrote (in his 1878 synonymical catalogue, cited by Calhoun 2015a) that Mead did not validly publish the name *eurytion*, and Mead (1876) himself who stated that it was an Edwards name, and William Henry Edwards who disregarded the name *eurytion* in three publications (Edwards [1876], 1877, and [1885] cited by Calhoun 2015a) and never published it, and obviously William Barnes (1897) did not think that *eurytion* was validly published and referable to *capella* when he named *capella*. Today, noone reading Mead's (1876) description would consider that Mead named the taxon (I read Mead's paragraph multiple times before I was astonished to read that someone had claimed that Mead was the author of the name *eurytion*.) How can we believe that Mead named *eurytion*, when the people who claim that Mead published the name *eurytion* erroneously believe the name applies to *carolae*, when it actually applies to *capella*?--the taxon could not be properly determined by those people because there was no valid and no clear original description by Mead—Mead's paragraph was a nomen dubium rather than a valid establishment of the name *eurytion*. In 1925 Barnes & Benjamin wrote that *eurytion* Mead was an available name and in 1938 they listed it as a synonym of *anicia* (along with *brucei*) with *capella* a subspecies, but *eurytion* Mead is actually the lower-altitude *capella* taxon so this mistake--made by several later authors including Calhoun 2015a who wrongly claimed that *eurytion* Mead applies to South Park butterflies--represents proof that the name is a nomen dubium (this is the bottom line: when later people cannot determine the correct taxon the name applies to, we can be certain that the name is a *nomen dubium*). Calhoun (2015a) found that Holland (1931 plate LVII=57 fig. 15 male "type" {Calhoun's lectotype} and fig. 16 female "type") was the first author to define the taxon properly, so the author of the name is actually Holland (1931), not Mead whose name--if he validly established it which is extremely doubtful--was a nomen dubium. We must trust the authors of that time including Mead and Edwards and Strecker and Barnes, and consider the misidentifications of later authors of the identity of *eurytion* as proof of the *nomen dubium*, and conclude that Holland (1931) named *eurytion*—not Mead. We did not know for sure that Mead collected *capella* June 21 and 23 at Turkey Creek until now. We were not sure Mead's "Plantago" larva was *E. anicia* from South Park until now (I wrongly considered it to be *Poladryas minuta arachne* until 2015). Only now are we certain that Mead's *eurytion* paragraph refers to *capella*, and prior to Holland (1931) Mead's *eurytion* name was a nomen dubium if it was validly named, thus is invalid. Calhoun's (2015a) designation of a lectotype is valid only if the lectotype is actually a specimen of *capella* or if Holland (1931) named *eurytion*. That lectotype must be considered invalid by anyone who believes that Mead actually named *eurytion* and was not a *nomen dubium*, because Mead's description of *eurytion* actually best fits *capella*; those people must use *carolae* for *eurytion*, and *eurytion* for *capella*. The ICZN Glossary defines nomen dubium as "a name of unknown or doubtful application", which fits the name *eurytion* in the 1800s, as only now do we conclude that Mead was describing *capella*, not *carolae*. The Glossary is the official meaning in the ICZN Code, so *eurytion* Mead is a nomen dubium and Holland 1931 is the author of the name *eurytion* so authorship must be changed in checklists such as Pelham's; the lectotype is likely to be a red-and-yellow-spotted variant of the *carolae* taxon, so here **Calhoun's lectotype is considered to be--and is hereby intentionally designated as--the valid name-bearing lectotype of *eurytion* Holland (1931)—not of *eurytion* Mead which is a nomen dubium--from TL Hoosier Creek.** (Holland 1931 called several specimens "type" so he did not designate a holotype/lectotype; his specimens were all syntypes).



*eurytion* L5 Hoosier Crk.  
coll. J. Scott



*capella* L5 Golden CO  
coll. J. Scott



*rorina* L5 Veedauwoo WY  
coll. Steve Spomer

*Poladryas minuta arachne* (W. Edwards). Three localities: Quite rare, here and there in the mountains below 9000 ft., one specimen on plains near Denver [June 1 or 3], one specimen near Denver on Aug. 20 (Apex Gulch to Denver [it still occurs on Green Mtn. along this route]) (quite fresh, so a 2<sup>nd</sup> brood in warmer parts of Colo.), Turkey Creek June [5-7 or 21-27], Twin Lakes [July 9-18] (Mead 1876).

*Chlosyne nycteis drusius* (W. Edwards)=Mead's "*harrisii*" (letter 148). Only one locality Turkey Creek: Occasionally in mts. at ~7500' late in June [Turkey Creek June 21-27 because lectotype coll. at 8000'] (Mead 1876). Vague "at the junction" [near Turkey Creek June 21-27] (letter 148). Walked [from Bradford Junction] along north road [the Mt. Vernon Wagon Road]—the same that I formerly took instead of the stage road, and branched off up a small brook [evidently 1 mile north then west up the brook, specifically the small brook W of North Turkey Creek 1 mile N of Bradford Junction 8000' {starting 1.5 mi. WSW Berrian Mtn.}, Jefferson Co. Colorado] (Journal June 26). **Type locality of *Phyciodes drusius* W. H. Edwards, 1884.** O.D. says only "Western form of the species" and "This is the Colorado and Arizona form of *Nycteis*." Lectotype has "June 26 Col° Ph. Drusus Edw Ms" and "Collection T. L. Mead" labels, thus was collected in **small brook W of North Turkey Creek 1 mile N of Bradford Junction 8000' (starting 1.5 mi. WSW Berrian Mtn.), Jefferson Co. Colorado** June 26, 1871. Evidently no other CMNH specimens have month/day.

*Chlosyne gorgone* (Hübner)=Mead's "*Phyciodes* 2" (letters 122, 148). Two localities: Not uncommon at lower levels and near Denver (much worn early in June [1 & 3]).+Found on Turkey Creek late June [7500' June 21 23 24 27].+None in neighborhood of South Park at above 8000'.+(Mead 1876).

*Chlosyne palla calydon* (W. Holland). One locality: Only found at Turkey Creek Junction, Colorado June 20 to 30 [actually 21-27].+~25 specimens taken.+(Mead 1876). Took lunch on walk from Bradford Junction to Turkey Creek [evidently South Turkey Creek eastward, as he would not have to walk to North Turkey Creek because it already ran right past the House], and caught a *Melitaea* [evidently *Chlosyne palla calydon*, maybe *Poladryas minuta arachne*, but not *C. nycteis drusius* which Mead called a "*Phyciodes*"] (Journal June 24). *Calydon* could not have been coll. June 20 as Calhoun (2013) wrote after the Journal June 20 listing because Mead arrived at Bradford Junction from Kenosha House at 8:30 p.m. not a.m. (Mead spent time in morning packing some things, and it is extremely doubtful that Mr. Blair would have brought Mead the *Parnassius* at ~1-3 a.m., and stage velocity earlier for 38 miles was only 4 mph, the route is difficult up and down ~five canyons, and Journal June 20 wrote nothing about collecting butterflies on June 20). **Type locality of *Melitaea calydon* W. J. Holland, 1931.** O.D. in Holland 1931 Butt. Book says "Turkey Creek Junction, Colorado" (copied from the locality in Mead {1876}, Calhoun 2015a p. 30) and figures male and female syntypes evidently coll. by Mead in 1871 (no lectotype). Evidently no locality on labels of syntypes. Thus TL is **Turkey Creek probably South Turkey Creek**, as some were evidently collected June 24 as the "*Melitaea*" noted in Journal June 24.

*Phyciodes cocyta selenis* (Kirby)=Mead's "*tharos*". Abundant on Turkey Creek [7500' June 21 23 24 27].+With it one or two spring form *marcia* were also taken.+(Mead 1876). Vague "at the junction" [Turkey Creek June 21-27] (letter 148).

*Phyciodes pulchella camillus* W. Edwards=Mead's "*Phyciodes 4*"=male, "*Phyciodes 1*"=female (see Brown 1964-1987 92:451, ignore Brown's comment after letter 122) (Edwards named the female "*emissa*"). Localities: The most abundant *Phyciodes* in mts. of Colorado, at all elevations below timberline the whole summer.+Fond of flowers.+(Mead 1876). Denver near Platte River two species collected [male=*camillus*, female=*emissa*] June 1 (letter 122). Cherry Creek near Denver June 3 [lectotype of female *emissa* collected](Journal June 3). [Walk from Bradford Junction 1 1/2 mi. E toward Denver June 27, for *Phyciodes 4*] male in PMNH with label 6 27-4 (butterfliesofamerica.com). Kenosha House (21m8f in Mead Collection in CMNH might have dates such as 7-4 to confirm this locality, but Brown 1964-1987 92:453 did not mention dates of those). **Type locality of *Phyciodes camillus* W. H. Edwards, 1871.** O.D. has only "Taken in Colorado by Mr. Mead." Lectotype has "Colorado *Phyciodes 4*/ 7-4 Mead Coll n" label, which would be Kenosha House, but Mead evidently collected no butterflies July 4 according to his journal and letters (although letter 151 says yesterday {July 15} he took the first holiday since leaving Denver except for June 8<sup>th</sup> when he was sick, implying he did something on July 4)(but the only butterflies labeled July 4 are this *camillus* {and maybe more *camillus*} and lectotype and paralectotype *Euphydryas anicia eurytion*), so if he collected it July 3 it was from Kenosha House to Webster, or if July 5 from Kenosha House, thus the TL should be listed as "**Kenosha House (perhaps Webster), Park Co. Colo.** The 7/4 on the label is now illegible, so should be examined with microscope for traces of purple indelible pencil (Brown noted that color for the fuzzy "*Phyciodes 4*", versus black ink for "Colorado Mead Coll n") to confirm that 7/4 date, because Journal does not indicate that any butterflies were coll. July 4, so even if the 7/4 appears microscopically on label it might be **mislabelled**. 21m paralectotypes in Mead coll. in CMNH have *Phyciodes 4* (males) (8 females have *Phyciodes 1* and are paralectotypes of *emissa* below) and presumably also have month and day on their labels. **Type locality of the *camillus* female *Phyciodes emissa* W. H. Edwards, 1871.** O.D. has only "From several specimens taken in Colorado by Mr. Mead." Lectotype has "6/3 Phyc. *camillus*" and "Collection T. L. Mead" labels, thus was collected along **Cherry Creek, Denver, Colo.** the TL, on June 3. 7 paralectotype females in Mead collection in CMNH have *Phyciodes 1* and presumably also month and day on labels.

#### Lycaenidae

*Lycaena helloides* (Boisduval)=Mead's "*Chrysophanus 1*" (letter 122). Only one surely-deduced locality: Denver near South Platte River June 1 (letter 122). It is moderately abundant in all parts of Colorado, on the plains as well as near the summits of the highest peaks, from the first of June to the last of August [the highest peaks and some August records are evidently *L. florus*] (Mead 1876).

*Lycaena florus* (W. Edwards). Mead did not distinguish this species from *L. helloides*; his plains and June records are *L. helloides*. The following parts of Mead's (1876) statement refer to *L. florus*, which is associated with *Vaccinium* swards in the Montane and Subalpine Zones: "It is moderately abundant in....parts of Colorado....as well as near the summits of the highest peaks [actually it is only in swales and slopes below timberline], from ["1<sup>st</sup> of June" refers to *L. helloides*]....to the last of August" (Mead 1876). Mead may have caught it at California Gulch July 21, from Mt. Lincoln to Fairplay July 22 & 24, Kenosha House July 26-27, at Bailey Aug. 24-26 and Aug. 29-Sept. 1, S of Georgetown August 5, and in Middle Park August 6-16.

*Lycaena heteronea heteronea* Boisduval=Mead's "*Lycaena* 11". One locality: Mead lumped ssp. *heteronea* and *gravenotata*, which I treat separately here (ssp. *heteronea* has fewer to no unh spots, *gravenotata* has many). Twin Lakes (letter 151). "much more abundant at Twin Lakes early in July" [a grassy spot near head of Upper Twin Lake July 13 mentioned in the *Lycaena rubidus sirius* paragraph] [July 9-18 at Twin Lakes also?].+Total 59 specimens taken [including ssp. *gravenotata* from Turkey Creek].+(Mead 1876). Twin Lakes, walk to Dayton, female MCZ labeled "Lyc 11 female 7-17 (Calhoun 2015b). Twin Lakes, walk west to head of upper lake, specimen MCZ with label written by Herbert Knowles Morrison "July 13, 1871 Twin Lakes Colorado (Calhoun 2015b).

*Lycaena heteronea gravenotata* Klots=Mead's "*Lycaena* 11" (letter 151). One locality: First ones seen June 23 Turkey Creek....Total 59 specimens taken [this number includes ssp. *heteronea* from Twin Lakes] (Mead 1876). This is one of "3 *Lycaena* (Hairstreak or Blue) new to me" from Turkey Creek (letter 148) and one of 'two new "*Lycaena*" blues' (Journal June 23) [eastward along South Turkey Creek] June 23 (see Table 2).

**TABLE 2.** Identity of three Lycaenidae new to Mead reported "At the Junction" as "3 *Lycaena* (Hairstreak or Blue), new to me" in letter 148 and Journal June 23-24. Journal June 23 reports 2 blues new to Mead, Journal June 24 reports a third new blue, and at those dates Mead walked from Bradford Junction ENE along South Turkey Creek. So the "At the Junction" three new Lycaenidae in letter 148 are the following:

#1 *Lycaena heteronea* {Mead (1876) wrote the first ones were June 23 on Turkey Creek}.

#2 *Hemiargus isola*=*alce* {Mead (1876) reported taken on Turkey Creek late in June, either June 23 or 24 so let's guess 23}.

#3 *Glaucopsyche piasus* {Mead (1876) wrote first ones were last week in June, either 23 or 24 so let's guess June 24 because Calhoun (2015a) p. 12 guessed 24}.

The following are NOT one of those 3 Lycaenidae new to Mead on June 23-24:

—probably **NOT** *Plebejus lupini* {little data, maybe he already caught it in Denver?}.

—**NOT** *Plebejus glandon rustica* as Mead (1876) reported "appears early in June".

—**NOT** *Plebejus melissa* {contrary to what Calhoun (2013) wrote after the journal June 23 entry} because Mead already found it common at Denver June 1.

—**NOT** *Plebejus saepiolus* {contrary to what Calhoun (2013) wrote after the journal June 23 entry} which Mead (1876) already found earlier with *Boloria frigga*.

*Lycaena rubidus sirius* (W. Edwards)=Mead's "*Chrysophanus* 2" (letter 151)=Mead's "*Thecla*" larvae. Six+ localities (underlined): First found Twin Lakes July 12 [E end E Twin Lakes to mtn. SW], quite rare except in immediate vicinity of Twin Lakes (Mead 1876). [E end E Twin Lakes to mtn. SW] one male paralectotype in CMNH dated 7-12. Taken at grassy spot near head of upper Twin Lake July 13 (40m2f including lectotype Mead 1876; 51m2f letter 151), 7m2f paralectotypes dated 7-13. [6 miles around Twin Lakes and W up Lake Creek, Lake Co.] one male paralectotype dated 7-14 (photo of label Calhoun 2015b p.181). [Walked around N side Twin Lakes to Dayton W of West Twin Lakes] 1m1f paralectotypes in PMNH labeled July 17 (butterfliesofamerica.com.), 3m1f paralectotypes dated 7-17. Specimens from Twin Lakes in CMNH, MCZ, PMNH (Calhoun 2015a p. 30). Also taken near Mt. Lincoln [July 22] (Mead 1876). Paralectotype male in CMNH has date 7-20 [California Gulch, Lake Co.]. Various points in South Park [Fairplay? June 9-12, July 6{7}] (Mead 1876). Paralectotypes 2f in CMNH have 7-29 dates [Bradford Junction to South Turkey Creek Canyon]. Paralectotype female in CMNH has 8-7 date [Dillon, Grand Co. Colo.]. Middle Parks [Aug. 6-16], (Mead 1876).

Additionally, 2m1f in Hy. Edwards coll. in AMNH and the Mead specimens in the Herman Strecker coll. in Field Museum Chicago are paralectotypes and may have month/date labels.

**Larvae** found at two localities (Mead reported these as “*helioides*” or “*Thecla*” or “*Lycaena*” on Yellow Dock=*Rumex*): Bradford Junction [along head of North Turkey Creek opposite the house] many caterpillars [of *Lycaena rubidus* on yellow dock *Rumex* growing in cultivated ground, resting on the stem buried 1-2” or more underground at base of plant and probably feed at night (Journal June 22, letter 142, Mead 1876), that larva now [July6] changed badly [dying], pupa normal color black and greenish, attached only by larval skin which remains around the tail (letter 151). [From Kenosha House walked barely into South Park] and found 3 *Lycaena* [*rubidus*] larvae in yellow dock [*Rumex*] (Journal June 16), under sticks & leaves, larvae full grown by last of June, larva pupa described, all died (Mead 1876). **Type locality of *Chrysophanus sirius* W. H. Edwards, 1871.** O.D. has only “Taken in Colorado by Mr. Mead.” Lectotype has “*Chrysophanus* 2 male /7-13” and “Collection T. L. Mead” labels, so TL is “**grassy spot near head of upper Twin Lake** (or the walk there), **Lake Co. Colo.** July 13.

*Lycaena arota virginiensis* (W. Edwards)=*schellbachii* Tilden=Mead’s “*Thecla* 7”=*Polyommatus* (Blues) near *arota* (letter 220) (it is NOT *Satyrium behrii* as Brown wrote after letter 189). One locality: Bailey Aug. 25 (Journal Aug. 25). Bailey Aug. 29, 3 specimens (Journal August 29). Sunny [south] side of North Platte R. at Bailey very large number Aug. 31 (Journal August 31). Sunny [south] side of North Platte at Bailey total 15m75f good and bad [Aug. 31-Sept. 1] (letter 189).

*Satyrium titus watsoni* (Barnes & Benjamin). Two localities: A few specimens were taken at Apex Gulch [Apex Gulch-Lookout Mtn. just W Aug. 3] with *saepium*, and others were obtained toward the last of August at Bailey’s Ranch, on the South Park Road [Aug. 24-26, not 29-Sept. 1?] (Mead 1876). [Apex Gulch or above on Lookout Mtn. Aug. 3] 3 specimens evidently on *Solidago* flowers (Journal August 3, letter 177). (Mead 1876 wrote “on the Georgetown road” for *melinus*, “near Apex Gulch” for *saepium*, and “at Apex Gulch” for *titus*, but all are evidently from same place according to letter 177).

*Satyrium saepium saepium* (Boisduval). One locality: [Apex Gulch or above on Lookout Mtn.] Aug. 3, 50 specimens in ~2 hours, mostly females, on *Solidago* flowers.+No specimens elsewhere.+(Mead 1876, letter 177, Journal August 3). (Mead 1876 wrote “on the Georgetown road” for *melinus*, “near Apex Gulch” for *saepium*, and “at Apex Gulch” for *titus*, but all are evidently from same place according to letter 177).

*Strymon melinus melinus* Hübner. Two localities: [Apex Gulch or just above on Lookout Mtn., August 3] one specimen maybe on *Solidago* flowers (Mead 1876, letter 177). (Mead 1876 wrote “on the Georgetown road” for *melinus*, “near Apex Gulch” for *saepium*, and “at Apex Gulch” for *titus*, but all are evidently from same place according to letter 177). From Bradford Junction ENE 1 ½ miles to South Turkey Creek found a “*Lycaena*” larva on *Sedum lanceolatum* (Journal June 23). Turkey Creek [June 23] [same] larva [reported as “*saepiolus*”] described, slug shaped, flesh color obliquely striped with crimson, which fed on *Sedum* [so is probably *Strymon melinus*, as it is similar to the tan larva with red-brown obliques in Table 3 of Scott {1992} though that had some lateral etc. marks also—it is evidently not *Sedum*-feeding *Callophrys mossii* which is green to red with white-over-thinner-red oblique marks], died (Mead 1876).

“*Thecla*” [*Strymon melinus*?]. Near Yosemite [California] caught a *Thecla* on way out from Hutchings’ on horseback (Journal Oct. 22).

*Callophrys spinetorum* (Hewitson)=*ninus* (W. Edwards). One locality: Three specimens [including lectotype] on willow blossoms on the South Park Road, “4” miles from the park [near Kenosha House because he measured from the flat plain in South Park, so just S of Kenosha House] June 17.+No others seen.+(Mead 1876, Journal June 17). **Type locality of *Thecla ninus* W. H.**

**Edwards, 1871.** O.D. has only “From three males taken in Colorado by Mr. Mead.” Lectotype has no locality or date, just “*T. Ninus* Edw 1 of 3 original types” and “*T. Ninus* Edw (Types)” and “Collection T. L. Mead.” Mead (1876) says he collected all 3 specimens on the South Park Road, 4 miles from the park, June 17, which is near Kenosha House because he measured from the flat plain in South Park, but his journal says he went “up” the road, so **TL is just S Kenosha House, Park Co. Colo.** June 17.

*Callophrys augustinus augustinus* (Westwood). “Found toward the last of May and early in June among the foothills of the Rocky Mts. at above 7000’, beside the road or at damp spots” [partly by the expedition?][Turkey Creek Can. June 5-7] (Mead 1876).

*Callophrys eryphon eryphon* (Boisduval). A few specimens taken early in June in Colorado, assoc. with *C. augustinus* [by the expedition?; if taken by Mead the site would be Turkey Creek June 5-7 where it is common then] (Mead 1876).

*Brephidium exilis exilis* (Boisduval). Two specimens, [Hot Springs Lake near] Salt Lake City Utah, [Oct. 2] (letter 220).

*Cupido “Everes” comyntas* (Godart). “*Lycaena* resembling *comyntas*” [based on flight time and probable locality it is *comyntas*, not *amyntula* (Boisduval) which Brown wrote in letter 220] one specimen evidently during train stop in Sacramento Valley [probably Sacramento] California Oct. 6 (letter 220).

*Cupido “Everes” amyntula valeriae* (Clench)= Mead’s “*comyntas*”. Found occasionally in Colorado [by the expedition?, no specifics, Mead could have caught it at Turkey Creek June 5-7, June 21-27] (Mead 1876).

*Celastrina humulus* Scott & D. Wright. [Reported as “*neglecta*”, but if identified properly for that time as *Celastrina “neglecta*”, this is *C. humulus* which occurs in Wheat Ridge in the Denver metro area utilizing native *Humulus lupulus* as larval host vining on various bushes/small trees such as *Salix exigua*/*Prunus americana*, whereas *C. neglecta* has no population in Denver and the cultivated *Cornus sericea* bushes (the *C. neglecta* host in Nebraska-Iowa-southern Minnesota etc.) now present in Denver were very doubtfully present in Denver in 1871.] “This species occurs rarely in Colorado.+One or two specimens were taken in June.”+Mead 1876). “My brother [Sam] caught a *Lycaena* resembling *Neglecta* (Common Blue) today. I send it with the rest.” [Denver near Platte R. June 3 because earlier in letter started June 2 he wrote “yesterday” which was June 1] (letter 122 completely written in Denver).

*Celastrina lucia sidara* (Clench) = “*pseudargiolus* var. *violacea*”. One locality Turkey Creek. “One specimen was taken, either near Denver [does not occur there] or on Turkey Creek, early in June” [5-7, when he collected N along Mt. Vernon Road/North Turkey Creek, and E into South Turkey Creek Canyon] (Mead 1876).

*Euphilotes ancilla barnesi* Opler & Fisher [reported as “*glaucion*” (W. Edwards), which does not occur there]. “Two or three specimens, apparently referable to this species, were taken on South Park road in latter part of June.” [evidently *barnesi* Turkey Creek June 21-27] (Mead 1876).

*Glaucopsyche piasus daunia* (W. Edwards). One locality: “Three specimens of this species, the only known examples, were taken on Turkey Creek during the last week in June” [21-27] (Mead 1876). . Walk [from Bradford Junction] to Turkey Creek [evidently eastward to South Turkey Creek, as he would not have to walk to North Turkey Creek because it already ran right past the House], and caught “*Lycaena*” new to me [Mead collected *Glaucopsyche piasus daunia* lectotype here June 24 or 23, see Table 2 which suggests June 24] (Journal June 24). **Type locality of *Lycaena daunia* W. H. Edwards, 1871.** O.D. has only “Taken in Colorado by Mr. Mead.” Holotype has only “Sagittigera male Col° T.L.M.” and “Collection W. H. Edwards”. Mead (1876) wrote “Three specimens of this species, the only known examples, were taken on Turkey Creek during the last week of June.” [June 21-27; it was new to Mead either June 23 or

24 with *Hemiargus isola*=*alce*], thus OD is **Turkey Creek, Jefferson Co. Colo. (from Conifer to South Turkey Creek Can. 1.5 mi. S Tinytown)**. (Note that North Turkey Creek runs right past Bradford Junction, and South Turkey Creek starts just ½ mile to the east, so Turkey Creek is an adequate name for butterflies collected even at Bradford Junction.)

*Glaucopsyche lygdamus oro* (Scudder). Not uncommon in the mts., disappears by the last of June.+A single female taken June 15 near the South Park [Kenosha House and S].+(Mead 1876). But Mead may have been mistaken about that date, because the female “type” of *oro* in MCZ is labeled “Fairplay Col<sup>o</sup> June 12, 1871 140 female” written in Herbert Knowles Morrison’s handwriting on white paper, obviously collected by Mead.

*Hemiargus isola* (Reakirt)=*alce* (W. Edwards). Two localities: “A few specimens were taken on Turkey Creek late in June [21-27; June 27 is just a guess by Calhoun 2015a] and near Georgetown about the middle of August [18-19]...the latter much worn and faded” (Mead 1876). Mead collected *isola* along South Turkey Creek June 23 or 24, see Table 2 which suggests June 23. **Type locality of *Lycaena alce* W. H. Edwards, 1871.** OD said only “From Colorado, taken by Mr. Mead.” That *alce* holotype is lost so its label cannot be examined, but surely had only Col<sup>o</sup> label because Brown wrote that it was from the Edwards collection (Brown 1964-1987 96:364), and Edwards always threw away Mead’s month and date data, and its exact date of collection never appeared in print. Mead (1876) wrote “A few specimens were taken on Turkey Creek late in June [21-27; it was evidently new to Mead either June 23 or 24, see Table 2], and near Georgetown about the middle of August.” Those Georgetown specimens were mostly from ~Idaho Springs Aug. 19, so TL would be “Turkey Creek Jefferson Co. Colo., or Idaho Springs, Clear Creek Co. Colo.”, except the Code requires TL to be locality of the neotype. Brown’s *alce* neotype is from Larkspur, Douglas Co. Colo. However, Art. 75.2 states that a neotype must not be designated as a matter of curatorial routine, as Brown’s was, therefore the neotype is invalid, so **TL is Turkey Creek Jefferson Co. Colo., or Idaho Springs, Clear Creek Co. Colo.**

*Plebejus melissa pseudosamuelis* (Nabokov). Four+ localities: About Twin Lakes [July 9-18], abundant by 1<sup>st</sup> week in July [error, Mead didn’t get to Twin Lakes until July 9] (Mead 1876; very plentiful letter 151). Twin Lakes [near the house E of lower Twin Lake and walked ~2 ½ miles W] (Journal July 11) [collected the invalid *melissa* lectotype which has label 7-11=July 11 CMNH, fig. Calhoun {2015a}, fig. Brown {1964-1987 96:372}, & fig. butterfliesofamerica.com, and Calhoun (2015b) notes that several specimens in Mead collection at CMNH have clippings dated 7-11]. Twin Lakes [dates?] 2m5f CMNH; [he evidently coll. none July 14 when he walked W ~8 miles up Lake Creek to a small park and thick pine forest within ~2 miles of the TL of *pseudosamuelis*. Letter 151 says I found little July 14.]. [E of E Twin Lake to tall peak SW, Lake Co. July 10] 2f “var. 2.7-10” CMNH. [E of E Twin Lake walked west 2 ½ miles, Lake Co.] 2m1f same data as invalid lectotype except the female adds “var. 2. 7-11” CMNH. [E of E Twin Lake W to head of Upper Twin Lake, Lake Co. July 13] 1f “var. 2.7-13” CMNH. [E of E Twin Lake W to Dayton, Lake Co. July 17] 1f “var. 2 7-17” CMNH. Mosquito Pass [lower on west or east side, as the butterfly does not occur in the alpine zone in Colorado] July 8 female MCZ (Calhoun 2015a p. 33). [Montgomery to Fairplay, Lake Co. July 24] 1f “*Lycaena* female/ 7-24” CMNH. [Between Montgomery City & Fairplay 10000-11000’] July 22 male PMNH (fig. 33 in Calhoun 69:32-33). In South Park [Fairplay July 6{7}]...abundant by 1<sup>st</sup> week in July (Mead 1876).

*Plebejus melissa melissa* (W. Edwards)=Mead’s “*Lycaena* var. 1” (Brown 1964-1987 96:373-375, letters 122, 151; Mead {1876} did not define *Lycaena* 1 & 2 contrary to what Brown wrote at end of letter 151)=Mead’s “*Lycaena* var. 5” (letters 148, 151)=Mead’s “*Lycaena* 2” and “*Lycaena* 2 var. 2” are the female without blue on ups bases, letter 122, Brown 1964-1987 96:373). Mead was confused by the males and females and the variation in amount of blue on



ups of females. Some early specimens in Denver & maybe some at Turkey Creek may have been *Plebejus lupini texanus*? Two localities: Denver near Platte River, June 1 (letter 122). [Platte River, Denver Colo. June 1] 1m paralectotype “Col. 6.1.71 Holland Collection” CMNH. Not very uncommon near Denver in May or June [June 1 & 3] (Mead 1876). [Bradford Junction to South Turkey Creek just 1.5 mi. S Tinytown, Jefferson Co. Colo. June 6] 1m paralectotype with label 6-6 CMNH. Turkey Creek [evidence from letter 148 written June 29-July 4: “*Lycaena* 2 {*melissa*} cannot be the female of 1 {*melissa*} as the female since taken {evidently here at Turkey Creek, because Mead (1876) said it didn’t occur at South Park and Twin Lakes until the first week in July, and he didn’t return to Fairplay until July 6} is quite different.”] *P. melissa* is not one of the three blues new to Mead collected on South Turkey Creek June 23-24, contrary to what Calhoun (2013) wrote after the journal June 23 entry, because Mead already found it common at Denver June 1 (see Table 2). **Type locality of *Lycaena melissa* W. H. Edwards, 1873.** O.D. says “From many specimens taken in Colorado by Mr. Mead, in the summer of 1871. I have also received this species from *Nevada*, and from Arizona by Lieut. Wheeler’s Expedition of 1871.” Lectotype is the female with wide orange bands called type and designated lectotype and fig. by Holland (1931 Butterfly Book pl. 66 fig. 17) mounted upside down, labeled “*Melissa* female Colo” and “Collection W. H. Edwards”, probably collected **along Platte River, Denver, Colo.** June 1, a reasonable TL because that is the lowest altitude matching the lowland *melissa* ssp. described in O.D., and the paralectotype coll. June 1 and Mead (1876) and letter 122 prove that *melissa* was collected in Denver June 1, and it was common there and evidently much less common on Turkey Creek June 6 so the lectotype was most likely to have been collected in Denver. The O.D. obviously describes only the lowland ssp. also found in Nev. and Arizona as Edwards declared, because O.D. wrote that unf has “a row of brown marginal points, above each of which is an orange spot” and unh has “a complete submarginal row of large orange spots” and “the presence of orange spots on primaries below” and the female ups of “*Melissa* is brown with a band of orange to both wings.” The invalid lectotype male designated by Brown has 3 labels “Col.” and “*Lycaena* 1 male 7-11” and “Collection T. L. Mead” [July 11 Mead was E of E Twin Lake then walked west 2 ½ miles, Lake Co.]; that lectotype is invalid because it belongs to a different taxon (ssp. *pseudosamuelis*) than the O.D. taxon ssp. *melissa* (the ICZN Code and proper taxonomic practice requires that any lectotype must belong to the taxon or one of the taxa defined in the original publication), and Holland already designated the lectotype (Holland made a thousand changes to his 1931 plate legends including 50 to plate 66 alone including numerous name changes, so his designation was not an “editorial mistake”, contrary to Calhoun 2015a). Brown treated the low-altitude and high-altitude butterflies as different taxa as Calhoun (2015a) demonstrated, and Brown knew his lectotype belonged to *pseudosamuelis*, so it must be concluded that Brown selected that specimen as lectotype anyway in an attempt to make *pseudosamuelis* a synonym of *melissa* out of competitive animosity toward Nabokov.

*Plebejus saepiolus saepiolus* (Boisduval) *Xgertschi* dos Passos=*whitmeri* F. M. Brown=Mead’s “*Lycaena* 8” (letter 148). Evidently one definite locality (Beaver Creek near Fairplay, but not Turkey Creek? unless the “all elevations” statement refers also to Turkey Creek): The most abundant blue in Colorado, occurs at all elevations below timber line.+124 specimens taken in June and July, often with *lygdamus* [which was found at Fairplay June 12 and evidently not at Kenosha House, see *G. lygdamus*] and “*epithore*” [*Boloria frigga*, which was reported from Beaver Creek June 9-10-11-12 and Kenosha House June 14-19].+Found in damp places.+(Mead 1876). {From Bradford Junction ~1 ½ miles ENE to South Turkey Creek}, two new “*Lycaena*” blues {letter 148 reports “3 *Lycaena* (Hairstreak or Blue) new to me” here, which evidently did NOT include *Plebejus saepiolus* (contrary to what Calhoun {2013} wrote after the journal June

23 entry), because he caught *saepiolus* earlier with *Boloria frigga*, see Table 2} (Journal June 23).

*Plebejus icarioides lycea* (W. Edwards)=Mead's "*Lycaena* 4" (letter 148). ~Four+ localities:

Especially abundant on outskirts of Denver early in June [1 & 3] among wild lupines [this ecotype has two generations on the plains].+In South Park [Fairplay ?June 9-12 but more likely July 6{7}] an empty egg and larva found on wild lupines.+Larva described, lost.+Remains on wing until August.+About 70 specimens taken.+(Mead 1876). NW of Fairplay on stage route to Mosquito Pass MCZ female labeled "*Lycaena* 4 7/8" (Calhoun 2015b). Twin Lakes walk to head of upper lake MCZ male labeled "*Lyc.* 4 7-13" (Calhoun 2015b). [Evidently Turkey Creek June 21-27] "*Lycaena* 4 & 8 puzzled me being so similar below but on spreading a couple of specimens for comparison the difficulty ceased." (letter 148).

*Plebejus shasta pitkinensis* Ferris=*calchas* (Behr)=Mead's "*Lycaena* 13" (letter 177). Two localities: "A single specimen was taken August 5, on Gray's Peak, at an elevation of 12,000 feet." [actually on either side or top of Argentine Pass which is 13207' 2 mi. ESE Gray's Peak, in Clear Creek/Summit Co. Colo. Aug. 5] (Mead 1876). "A single specimen on continental divide near Gray's Peak [Argentine Pass] Aug. 5, I mistakenly marked this 8.6 instead of 8.5" (letter 177). "One other was seen on a mountain near Twin Lakes at a similar elevation." [Mtn. 12600' 2.2 mi NE Quail Mtn. SW of Twin Lakes, July 10] (Mead 1876).

*Plebejus lupini texanus* (Goodpasture). If Mead caught any in Denver, this would be the ssp.

*Plebejus lupini lutzi* dos Passos="acmon" (Westwood)=Mead's "*Lycaena* 9" (letter 148). Mead evidently collected this at Turkey Creek and probably collected ssp. *texanus* at Denver, maybe at two other sites (the vague records are mostly a conglomeration of misidentified specimens.) "This ("acmon") is an abundant species in Colorado, occurring at nearly all elevations from May to the 1<sup>st</sup> of September" [no exact records, and are most records including May actually from the expedition?—Mead did not collect in May] (Mead 1876). [Fairplay?, Kenosha House?] "A few specimens ["*battoides*", evidently *lupini* as *Euphilotes battoides* (Behr) or *E. enoptes* (Boisduval) does not occur there] were taken in Colorado, nearly all on headwaters of Platte R. at moderate elevations." (Mead 1876). [Turkey Creek June 21-27] "*Lycaena* 1 [*melissa*] & 9 [*lupini*] have been till [until] recently all labeled 1. The difference is plain." (letter 148) [*P. lupini* is doubtfully one of the "3 *Lycaena* (Hairstreak or Blue) "new to me" June 23-24 reported in letter 148, and Mead perhaps caught ssp. *texanus* already at Denver, see Table 2].

*Plebejus glandon rustica* (W. Edwards). Frequents sunny places in the open pine forests on Compositae flowers, appears early in June, quite abundant from 7000' [Turkey Creek Canyon June 5-7 where it is uncommon now but may have been commoner in cooler 1871] to 10000' [presumably Kenosha House June 29-July 5, and Fairplay July 6{7} & July 24, and Mt. Lincoln July 22, and Middle Park August 6-16, perhaps mts. S Twin Lakes July 10 & 12], and remains on wing until the last of August.+75 specimens taken during the season.+(Mead 1876). From Bradford Junction went down the road about 1 ½ miles [ENE to South Turkey Creek] found two new "*Lycaena*" blues [letter 148 reports "3 *Lycaena* (Hairstreak or Blue) new to me" here, but *P. glandon* was NOT one of those two or three new blues {see Table 2} because Mead {1876} reported it appears early in June] (Journal June 23), and *glandon* is uncommon at Turkey Creek. Polyommata blue larva [unknown species] on leguminous plant, [up Beaver Creek July 6] (letter 151).

#### Moths

moth larvae spiny black on wild rose bush, gulch N of Bradford Junction=head of North Turkey Creek June 22 (letter 142).

*Hemileuca nevadensis* Stretch="Saturnia" maia (Drury). Larvae (described) on willow and cottonwood preferring willow just outside Denver near Platte R. June 1 (letter 122). Larvae from Denver now large June 28 (letter 148). 590 larvae of larger willow feeder from Denver, sent July 7 (letter 151). [They are not *Argynnis edwardsii*, see letter 177]. One about ready to pupate July 24 (letter 158). Larvae have now turned to pupae ~Aug. 16 (letter 177). Larvae being reared at Kenosha House, Journal August 26. The willow-feeding larvae turned out to be *Saturnia maia* (letter 208 written ?Sept. 26). Letter 208 says Blair let some black *Saturnia maia* larvae starve.

## **Diary of Mead's Travels and Butterflies Collected**

This section consists of Mead's travels and locations visited in 1871, descriptions of his activities each day from his journal and all other sources (especially whether he collected butterflies and what he collected), and lists of the butterflies he collected each day. This diary was compiled and interpreted using all available information, including his journal (Calhoun 2013), topographic maps and historical trail maps of his route, Mead (1876), his letters (Brown & Brown 1996), other publications about his travels including Calhoun (2015a), other specimens in museums, all interpreted using my knowledge of the area and its butterflies. When the information about butterflies collected was vague and mentioned only a location where he collected and other sources revealed that he was there only during a time period such as July 6-16, I list just "Butterflies collected July 6-16" after the last date of that time period (July 16 in this example). Mead's 1871 journal was in the hands of a dealer who presumably purchased it from someone who had access to Mead's writings after his death (a relative who wanted money, one would suspect), and then was purchased by John Calhoun, who read the words and published them (Calhoun 2013, later updated but Mead's words were evidently not changed). Calhoun (2013) includes numerous short biographies of persons that Mead mentioned that I ignore here, plus hundreds of photos of people and buildings and ships and trains etc. mentioned by Mead that are also ignored here—I include below only Mead's writings on the butterfly-related information (butterflies and localities) plus other stuff that Mead wrote that is interesting or useful to pinpoint his travels or activities (a horsefly bite mentioned in journal and a letter proved important to pinpoint one day's collecting for instance), and I leave out everything else that is not relevant to this paper on butterflies. Mead's writing is simplified and clarified and often condensed here so is usually paraphrased rather than his original written words, though when disagreements might occur about interpretation of Mead's statements (as to location of travels, or the identity of a butterfly such as *halcyone*) I generally try to give his original wording. (Anyone who wants to copy Mead's original words can get them from Calhoun {2013}, as under U.S. copyright law the mere purchase of a diary does not buy copyright of its words because copyright is retained by the author of those words, and Mead's words were copyrighted by Mead himself until 2006 when they entered the public domain {his year of death 1936 plus 70 years}, and transcriptions of Mead's words are not copyrightable because they are not original works they are mere copies that Calhoun read from Mead's journal.) Calhoun should use the corrections in the current paper to improve that 2013 paper which has numerous mistakes, to make a corrected improved version. I also leave out Mead's activities from January to mid May prior to his trip. My comments and corrections of butterfly species and locations etc. are given in brackets [    ].

Mead's book of letters concerning his trip is now lost or misplaced, but luckily Brown xeroxed most--evidently including all the important ones--before they were lost, and those were published by Brown & Brown (1996). The date listed at the start of each letter is when Mead started the letter

and that date is often earlier than when he mailed it, as many events described in those letters occurred after that starting date.

Letter 180 to W. H. Edwards states that Mead also had a “diary”, but probably that “diary” was the journal Calhoun purchased (Calhoun 2013), because Mead did not have much time to write lengthy diary entries each day, and he mostly lacked modern lights at night, so it is doubtful that he could have written a large separate diary. The “localities” mentioned as being in the diary in letter 180 are not present in Mead’s journal, suggesting they might be in a separate “diary”, but perhaps he just forgot to write those, or maybe that just referred to a list he mailed with the letter.

Some of Mead’s locations and times have been corrected from those in Table 1 of Calhoun (2015a), specifically for June 7, 20, 21, 23, 25, 27, July 4, 27, 28, and August 13, 18-20, as follows: June 7 he walked 1.5 miles down the road (to South Turkey Creek) not 0.5 miles; June 20 he arrived at Bradford Junction 8:30 p.m.=20:30 not 10:30; June 21 & 23 he walked down the road ENE to South Turkey Creek; June 25 he walked south of Bradford Junction; June 27 he walked ENE along the Denver Road to South Turkey Creek (I think he walked that way June 7, 21, 23, 24, 27); July 4 the journal does not report any butterflies collected so the few labeled 7-4 may be mislabeled; July 27 he arrived at Bailey 17:30 not 17:50; July 28 he left Bailey at 8:00 not 20:00; August 13 he walked not rode to fish; Sept. 18-20 he went S of Florissant then W then S along Currant Creek to Cañon City (he did not go through Colorado Springs).

January 1-May 16. [Irrelevant happenings, plus preparation for the trip.]

May 17-26. Took railroad to Baltimore then went to Coalburgh W.Va. to visit W. H. Edwards and met his son William S. Edwards. May 20 caught butterflies near Edwards’ house and green Geometridae and *Sphinx* larvae on “Sour Wood [*Oxydendrum arboreum*].” May 21-22 found more larvae and *Catocala* larvae at Coalburgh. May 23-27 took steamer ships to Charleston W.Va. and Cincinnati, then a train to Chicago, where W. S. Edwards returned to Coalburgh.

May 27 Saturday. Met brother Sammy [Mead’s brother Samuel L. Mead, usually called “Sammy” in the journal] in Chicago. [Sam accompanied Theodore Mead on the whole trip detailed below with a Winchester rifle {letter 154} to hunt game, but reportedly found little other than two deer their guide shot {letters 186, 192}, so he shot various birds etc. Sam was also supposed to provide protection against indians, and Theodore took a Colt pistol and wrote that indians always have the best weapons. But all they found on the trip was stories of hostile Utes and Arapahoes in Middle Park, though they passed the remains of a cabin where the year before Arapahoes killed and scalped the inmates and burned their cabin then the Utes drove them 20-30-40 miles back to their reservation in North Park and the Utes went to the White River Reservation. They heard that miners N of Hot Sulphur Springs were cleared out by the indians, who burned huge tracts to drive the game as they retreated. {Letters 153, 154, 177, 183, 186, 192}]. Sammy rowed us out onto Lake Michigan and we collected large numbers [~540, letters 118, 154] of floating [dead] beetles washed ashore.

May 28 Sunday. Collected many more beetles on the beach there.

May 29 Monday took train to Omaha where a few beetles were found.

May 31 Wednesday. Train reached Cheyenne Wyo. where we caught a few beetles and saw one *Colias eurytheme*. Reached Denver at 7 p.m. and stayed at American House [full of bedbugs says letter 149]. [Letter 122 wrote “prairie looks rather [more] brown than green and there are few flowers.”].

Butterflies collected May 31: saw one *Colias eurytheme*.

June 1 Thursday. Denver, Sammy Mead and I walked along Platte R. and found numbers of butterflies, beetles, & some larvae. Bought blankets and utensils.

Butterflies collected June 1: *Pontia protodice* 9 specimens, *Aglaia milberti* many larvae on *Urtica dioica gracilis*, *Argynnis edwardsii*, *Vanessa atalanta?*, *Phyciodes pulchella camillus*, *Lycaena helloides*, *Plebejus melissa*, *Hemileuca nevadensis*="Saturnia maia" larvae on *Salix* [probably *exigua*] & *Populus deltoides monilifera*.

June 2 Friday. Denver, Sam and I hunted butterflies with little success in morning.

June 3 Saturday. Denver, Sam and I walked out on prairie in direction of Cherry Creek & found plenty of butterflies; in afternoon I walked alone in same direction.

Butterflies collected June 3: *Phyciodes pulchella camillus* [lectotype of *emissa*, the female], *Celastrina humulus*.

Butterflies collected in Denver June 1-3: *Pholisora catullus*, *Pyrgus communis?*, *Neominois ridingsii*, *Poladryas minuta arachne* one, *Chlosyne gorgone*, *Plebejus icarioides*, *Plebejus lupini texanus?*

June 4 Sunday. Denver, took a little walk and experimented on numerous ants. Packed.

June 5 Monday. From Denver took stage for Fairplay, 12 mi. across prairie, then up Turkey Creek Can. the sides steep and covered with pines, found flowers and many butterflies including *Parnassius phoebus* [letter 129 reports butterflies appeared in large numbers and Sam caught a *Papilio indra*], reached dinner [lunch] station [Bradford Junction] ~3 p.m. After dinner walked ahead but after 4 miles found I had taken wrong road [the Mt. Vernon Wagon Road {currently road CR73} northward as he states in the June 26 journal entry] so walked back to station [and missed the stage, so stayed here at night, with numerous bedbugs {pinned 6 to my pillow} according to letter 149 so he rubbed kerosene on his skin before going to bed]. [Mead failed to give mileage from Denver to lunch, but later mileage from Fairplay to the junction indicates he ate lunch at Bradford Station].

Butterflies collected June 5: *Parnassius phoebus smintheus*, *Papilio indra* one, *Polygonia gracilis zephyrus*.

June 6 Tuesday. Bradford Junction. After breakfast 7 a.m. took lunch and walked down the road [ENE, altogether 16 road miles round trip into South Turkey Creek Can. so 8 miles one way getting to 1.5 mi. S of Tinytown] [letter 129 says "I took a long walk about 8 miles down Turkey Creek finding many unfamiliar insects."][this assumes that Mead's "down the road" meant ENE toward Denver along South Turkey Creek; actually, the Conifer 7.5 minute topographic map shows that only the [Mt. Vernon Stage] road north inclines downward right away from Bradford Junction into North Turkey Creek, while the road to the S goes up 300' in altitude for a mile before going down a bit to Kennedy Gulch, and the road to the ENE goes up ~120 ft. in 1/3 mile before gradually going down into South Turkey Creek Can.] [Mead 1876 made numerous references to 7500' and Turkey Creek, so it is necessary to believe that Mead's "down the road" means ENE into South Turkey Creek on the road to Denver in order to place Mead down into South Turkey Creek Canyon for enough time to catch all those 7500' butterflies, as the butterfly diversity is greater in the canyon than at Bradford Junction—and Mead called this stop "Turkey Creek Junction" because he spent most of his collecting time at South Turkey Creek and a tributary of North Turkey Creek flows north right past the hotel] and caught "*Papilio* (2)" [#2] including *Papilio* "*pilumnus*" [=female *multicaudata*], and 12 *P. multicaudata*, got tired.

Butterflies collected June 6: *Parnassius phoebus smintheus* 12m1f, *Papilio glaucus rutulus* moderate numbers, *Papilio multicaudata* 12, *Argynnis callippe meadii* one [the lectotype of *meadii* coll. June 6], *Limenitis weidemeyerii* one, *Plebejus melissa*.

June 7 Wednesday. Bradford Junction. Walked 1 ½ mi. down the road [evidently to ENE like yesterday to South Turkey Creek] and caught 41 *Parnassius phoebus*. At 1:30 p.m. took horrible very cold stage 64 miles to Fairplay [letters 129 & 149 say it was rough and below freezing, and in South Park "It is yet quite early in the season"].

Butterflies collected June 7: *Parnassius phoebus smintheus* 41m.

Butterflies collected June 5-7: *Polites themistocles*? 1m1f, *Papilio eurymedon*, *Papilio multicaudata* 12, *Papilio polyxenes asterias*, *Papilio zelicaon*?, *Euchloe ausonides* evidently, *Oeneis uhleri*, *Poladryas minuta arachne* (or June 21-27), *Callophrys eryphon*?, *Callophrys augustinus*?, *Celastrina lucia sidara*, *Cupido* “Everes” *amyntula valeriae*?, *Plebejus glandon*?

June 8 Thursday. Arrived at Fairplay 5 a.m. sick and miserable, went to gold mines and panned 3 cents worth. Very cold. Fed my larvae.

June 9 Friday. Fairplay, walked to Beaver Creek [just N Fairplay] to examine a mine & found several butterflies on the hillside. In afternoon went in wagon to Buckskin Joe [1.5 mi. NW Alma—evidently no butterflies, letter 132 said he threw snowballs at Sam], Sam had headache.

Butterflies collected June 9: *Anthocharis julia*, *Plebejus saepiolus*.

June 10 Saturday. Fairplay. Sam and I went to Beaver Creek & found many butterflies. We shot rifle at catbirds etc. [Letter 151 describes Beaver Creek as flat and dry with many shrub willows.] In afternoon I took a walk alone & found beetles.

Butterflies collected June 10: *Erynnis icelus* one, *Anthocharis julia* including lectotype, *Plebejus saepiolus*.

June 11 Sunday. Fairplay. After dinner [lunch] Sam and I walked in woods on opposite [south] side of Middle Fork of South Platte R. At night caught crickets & sang songs with Sam.

Butterflies collected June 11: *Plebejus saepiolus*.

June 12 Monday. Fairplay. Walked up Beaver Creek several miles hunting butterflies, where Sam found a valuable caterpillar. After dinner [lunch] walked on Beaver Creek again finding very little. Sam shot the head off a robin with his rifle. Enjoyed a place on the stage for Kenosha Ranch=Kenosha House [at night].

Butterflies collected June 12: *Hesperia nevada nevada* 1m lectotype, *Anthocharis julia*, *Pieris marginalis* not uncommon, *Plebejus saepiolus*, *Glaucopsyche lygdamus oro* (female type in MCZ labeled Fairplay Col<sup>o</sup> June 12, 1871 in Herbert Knowles Morrison’s handwriting, obviously collected by Mead).

Butterflies collected June 9-12: *Anthocharis julia* June 9-10-12 (10m12f), *Boloria eunomia* abundant, *Boloria freija*, *Boloria frigga*, *Euphydryas anicia eurytion* larvae, *Lycaena rubidus*, *Plebejus saepiolus* June 9-10-11-12.

June 13 Tuesday. [Mead evidently stopped maybe at Hamilton {1.5 miles NW of Como} to sleep] Our host woke me at 5:30 a.m. and after breakfast got on stage at 6:30 a.m. and the stage rumbled along [NE] over the South Park and 3 miles into the mountains [to Kenosha House] where I stopped at 11 o’clock [evidently 11 a.m.] The stage went 28 miles [from Fairplay to Kenosha House]. The day was overcast & cloudy so caught few butterflies, found Arctiid larva & several beetles. Forest fires were burning and large patches of country had been burned. [Donnegan et al. {2001} studied fire history in the Pike National Forest. Many fires occurred there in 1850-1871 because of mining and logging for mine timbers and cabins and camping and lack of fire suppression (white miners, loggers, and settlers came to Colorado after 1850 and set many fires), and 1871 was one of the frequent-fire years, as drought years in the late 1860s dried an accumulation of forest fuels, and normal rainfall in 1871 brought lightning to ignite the fires. They found burned 1871 tree-rings from trees at five sites farther south in Park County {from near Tarryall Reservoir to Thirtynine Mile Mountain at the south end of South Park}; the 95%-of-normal precipitation in the spring and summer of 1871 {Mock 1991} and more rain later in 1871 ended the drought {tree-ring studies by Stockton & Meko, 1993; Woodhouse & Brown 2001; Woodhouse et al. 2002 showed normal precipitation and stream flows in 1871} and that rain watered the remaining combustible materials so Donnegan et al. reported fewer recorded fires until 1875-1880 when fires became more common again. Those early fires generally

produced <25% of burned trees because tree density was low. The frequency of fires decreased greatly only after ~1920 when the U.S. government started the idiotic Smoky the Bear fire suppression program which has continued to the present, so now the forests have a huge accumulation of combustible wood in horribly-unnatural dense forest (especially Engelmann Spruce and Lodgepole Pine) tightly packed with unhealthy crowded water-deficient trees. The result of that dog-hair-thick forest is huge catastrophic fires such as the Yellowstone and Hayman fires with flames 50m high that kill every tree, and huge infestations of bark beetles that kill hundreds of square km of the too-thick trees that are unable to produce enough pitch they normally use to hydraulically expel the beetle larvae out of their chewed tunnels because the crowded trees are stressed by less sunlight and less water and nutrients because of the crowding.]

June 14 Wednesday. Kenosha House [a building on hillside on SE side of the valley, 1.5 rd. mi. N Kenosha Pass], walked up little brook [Hoosier Creek NW of Kenosha House] to top of mts. where there was a pine lake [Dake Lake=Lininger Lake] with ducks & dragonflies. [Letter 151 describes a typical shrub-willow-low bush fen “flat mossy willow bog” here where *Boloria freija-frigga-eunomia* fly.] Went with Mr. Samuel L. Blair down gulch [Kenosha Gulch NE of Kenosha House near current town of Webster—letter 153 says “About 2 miles down the gulch there were large patches of snow ice.”] & he chopped out a 50 lb. block of ice for ice cream [proving the area did not have an early spring].

Butterflies collected June 14: *Euphydryas anicia eurytion*.

June 15 Thursday. Kenosha House. Walked along small rivulet then along road southward toward South Park. [Journal says “Stage 28 miles” which evidently means the distance from Fairplay where Sam had sent word on the stage that he would arrive [from Fairplay] in a few days.]

Butterflies collected June 15: doubtfully *Glaucopsyche lygdamus* because Mead 1876 wrote that he collected a single female near the South Park June 15, but the female “type” in MCZ is labeled Fairplay Col<sup>o</sup> June 12, 1871 in Herbert Knowles Morrison’s handwriting, obviously collected by Mead, so the specimen was probably collected at Fairplay.

June 16 Friday. Kenosha House. Took walk 3 miles to South Park [barely into South Park] and hunted butterflies, found many *Colias* [*C. philodice* spring form—in 2015 *philodice* was moderately common at Kenosha House and scarce in South Park so he probably collected most of those *Colias* before getting to the Park]. [Today, U.S. 285 from Kenosha House south to Kenosha Pass is 1.5 miles, then goes south then west 2.05 miles to the bottom of South Park, for a total of 3.55 miles, so Mead’s mileage is an underestimate, or he could have just kept going south after the pass or just walked west from Kenosha House through woods over the ridge near current FR810 and gotten there in just 2 miles] Grass near the Kenosha House caught fire from the woods and I watched while Mr. Blair put it out. Found several butterfly larvae similar to the one Sam first discovered [*Parnassius?*], some hidden in grass near hostplant, 2 were in a bunch of grass and on an aromatic shrub a long distance from their usual hostplant, plus 3 *Lycaena* [*rubidus*] larvae in yellow dock [*Rumex*].

Butterflies collected June 16: *Hesperia nevada nevada* 2m3f, *Lycaena rubidus* 3 larvae, *Colias philodice* spring form [but not the mislabeled *hagenii* lectotype. Mead collected lectotype *Colias philodice*=*hagenii* which was in envelope dated 6/16, but the specimen was a **mislabeled** summer form {misplaced into the wrong envelope by Edwards} from his trip later in the summer, Fisher {2012}. Fisher and Scott collected only the spring form here in June 2015, and Fisher collected only the spring form along Beaver Creek near Fairplay in June 2011].

June 17 Saturday. Kenosha House. Walked up the road a little way [S toward Kenosha Pass—Mead {1876} wrote that today he caught 3 *ninus* “4 miles from the park”, which is near Kenosha House because he measured from the flat plain in South Park] and caught a number of butterflies on *Salix* catkins including a female *Papilio multicaudata*. Mt. Blair caught about 70 butterflies

for me and Sam Mead also caught a lot. Evening Sam and I took lantern and found very few moths on the *Salix* catkins.

Butterflies collected June 17: *Hesperia nevada nevada* 1m 1f, *Papilio multicaudata*, *Callophrys spinetorum* [lectotype of *ninus* caught today].

June 18 Sunday. Kenosha House. Collected a few insects.

June 19 Monday. Kenosha House. Day overcast & cloudy so could not find many butterflies.

Some Greasers stole my bag containing *Parnassius* female to get eggs.

Butterflies collected June 19: *Parnassius phoebus smintheus* female.

Butterflies collected June 14-19: *Pieris marginalis*?, *Boloria freija* 36 specimens, *Boloria frigga* 20 specimens, *Vanessa virginiensis*, many *Euphydryas anicia eurytion*, *Plebejus saepiolus*.

June 20 Tuesday. Started at Kenosha House. Put up some things to take with me to the Junction.

Mr. Blair brought in a *Parnassius* female with an egg undeposited and said there were several on a tuft of “grass.” Took stage 38 miles to the Junction [Bradford Junction], arrived 8:30 [evidently **p.m.**, because Mead spent time in morning packing some things, and it is extremely doubtful that Mr. Blair would have brought Mead the *Parnassius* at ~1-3 a.m., and the stage velocity on earlier trips was only 4 mph, the trip is rugged up and down ~5 canyons, and he wrote nothing in journal about collecting butterflies on June 20] [Calhoun {2015a p. 12} wrote that he arrived at Bradford Junction 1030 hrs=10:30 a.m., and Calhoun (2013) wrote after this Journal June 20 entry that he collected *Chlosyne palla calydon* specimens on this date {based on Mead’s 1876 misstatement} and *Euchloe ausonides coloradensis* “around” this date, but those *calydon* dates were a **mistake** because he arrived here at 8:30 p.m. instead of 10:30 a.m.; Mead {1876} mistakenly wrote that he coll. *calydon* June 20-30 but he was there only June 21-27 {or just June 21 23 24 27 if they were caught in South Turkey Creek} and definitely collected them only June 24][Calhoun {2013} guessed that *Euchloe ausonides coloradensis* was collected from Mead specimens near Bradford Junction around this date, even though the lectotype has no location or date, see *Euchloe* writeup above][There is a reason Mead returned to Turkey Creek: Letter 129 reports that South Park has few flowers and insects because it has not greened up yet, and letter 149 says it is “seeming waste of dry stubble-but afterward I found out that spring had not yet commenced”, so they returned to Bradford Junction. Letter 131 says “Still there are a good many species of butterfly out and I am having good success in collecting. The trees, etc. are just budding and the season evidently corresponds to early spring.” Later Aug. 21 he wrote in letter 180 “Middle Park is an arid waste of Sage Brush and cactus,” as Mead was not used to the lesser greenery in arid Colorado compared to New York.]

Butterflies collected June 20: Mr. Blair found *Parnassius phoebus smintheus* female and egg.

June 21 Wednesday. Bradford Junction. Walked 2 miles down the road [ENE to South Turkey Creek to be consistent with June 6-7, see June 6 entry; Calhoun wrote he probably went southwest which is doubtful because that road and 2 creeks southward incline upward 300 ft., and the road actually goes southward not southwestward as it inclines upward {Conifer 7.5’ topo map}] and found many “*Colias ~~interior~~ alexandra*”, and some empty *Parnassius phoebus* eggs on *Sedum lanceolatum*.

Butterflies collected June 21: *Parnassius phoebus smintheus* 2 eggshells, *Colias alexandra* 27m7f, some *Colias eurytheme*, *Euphydryas anicia capella* one.

June 22 Thursday. Bradford Junction. Went along the gulch opposite the house [evidently the head of North Turkey Creek which is just west of the road and house] and inspected Mr. Elliott’s crops. The day was rainy and very few butterflies were flying but found many caterpillars [of *Lycaena rubidus* on yellow dock *Rumex*].

Butterflies collected June 22: eggs *Colias alexandra*, *Euptoieta claudia* numerous eggs, *Lycaena rubidus* larvae on yellow dock *Rumex*, moth larvae on wild rose bush.



June 23 Friday. Bradford Junction. Went down the road about 1 ½ miles [again this evidently means ENE to South Turkey Creek as before, {not “southwestward” from Bradford Junction as Calhoun JLS 69:12 wrote, because the road and two creeks S of the House all slope and flow northward}], catching a new *Vanessa* [*Nymphalis californica*] and two new “*Lycaena*” blues [*Lycaena heteronea* definitely and possibly *Hemiargus isola*—letter 148 reports “3 *Lycaena* (Hairstreak or Blue) new to me” here which includes *Glaucopsyche piasus daunia* new maybe June 24] [See Table 2 which reports the identity of those three new Lycaenidae: Journal July 23 reports 2 blues new to Mead, Journal July 24 reports a third new blue, and at those dates Mead walked from Bradford Junction ENE along South Turkey Creek. *Hemiargus isola* or *Glaucopsyche piasus* were caught June 24, and Calhoun 2015a and Table 2 guesses that it was *H. isola* that was caught June 23.], found a “*Lycaena*” [*Strymon melinus* probably] larva and *Parnassius* egg on *Sedum lanceolatum*. Set up a laying [oviposition] box for *Parnassius*.

Butterflies collected June 23: *Erynnis persius* one, *Hesperia nevada nevada* 1m, *Parnassius phoebus smintheus* egg, *Nymphalis californica timidar*, *Lycaena heteronea gravenotata*, *Strymon melinus* larva, *Hemiargus isola* June 23 or 24.

June 24 Saturday. Bradford Junction. Took lunch on walk to Turkey Creek [evidently South Turkey Creek eastward, as he would not have to walk to North Turkey Creek because it already ran right past the House], and caught a *Melitaea* [evidently *Chlosyne palla calydon*, maybe *Poladryas minuta arachne*, but not *C. nycteis drusius* which Mead called a “*Phyciodes*”], a “*Lycaena*” [possibly *Glaucopsyche piasus daunia* lectotype coll. late June], a “*Grapta*” [*Polygonia satyrus*, not *P. gracilis zephyrus*], and moth new [all three new] to me, plus 4m *Argynnis* “*Halcyone*” [mostly unsilvered *Argynnis hesperis*][fully-silvered-unh *A. hesperis* are very rare ~1%, and their ups postmedian black bars are usually narrower than the silvered western Colo. *A. hesperis electa* that Mead collected in Lake Co. near Twin Lakes]. Horsefly bit me as I was trying to catch a *Halcyone*. Got note from Sammy [who was still at Kenosha House evidently]. [See Table 2 which reports the identity of new Lycaenidae Mead caught at South Turkey Creek: Journal July 23 reports 2 blues new to Mead, Journal July 24 reports a third new blue, and at those dates Mead walked from Bradford Junction ENE along South Turkey Creek. *Hemiargus isola* or *Glaucopsyche piasus* were caught June 24, and Calhoun 2015a and Table 2 guesses that it was *G. piasus* that was caught June 24.]

Butterflies collected June 24: *Argynnis hesperis* unsilvered, *Limenitis weidemeyerii*, *Polygonia satyrus*, *Chlosyne palla calydon*, *Glaucopsyche piasus* (including the lectotype) June 24 or 23.

June 25 Sunday. Bradford Junction. After dinner [lunch] walked along the road [“along the road” is a new phrase, so evidently he walked south on the South Park-Denver road, as he would have wanted to go that way at least once, plus letter 148 says the day after the horsefly bite {which was June 24} he “followed up a little rivulet on the mountainside” which fits the intermittent tributary of North Turkey Creek that flows north from Conifer to Bradford Junction], catching a male *Halcyone* [*A. hesperis*] and 2m of another species which differs in having the usual spots silvery instead of yellow [2 mostly-silvered ones are rare in one day in *A. hesperis*, so perhaps those two are *Argynnis atlantis sorocko* which should occur here and is always fully silvered].

Butterflies collected June 25: *Argynnis hesperis* unsilvered 1m, *Argynnis atlantis sorocko*? 2m.

June 26 Monday. Bradford Junction. Walked along north road [the Mt. Vernon Wagon Road]—the same that I formerly [June 5] took instead of the stage road, and branched off up a small brook [evidently 1 mile north then west up the brook, specifically the small brook W of North Turkey Creek 1 mile N of Bradford Junction 8000’ {starting 1.5 mi. WSW Berrian Mtn.}, Jefferson Co. Colorado]. Found lots of *Halcyone* “&c” [evidently mostly *A. hesperis* unsilvered]. Came home after the stage passed [going W] so couldn’t send my letter to Sammy.

Butterflies collected June 26: *Colias alexandra* male, *Argynnis hesperis* unsilvered many, *Chlosyne nycteis drusus* [lectotype is dated June 26].

June 27 Tuesday. Walked 1 ½ miles on the Denver road collecting [Mead wrote “Denver road”, so he went E to South Turkey Creek Can.]. About 12 noon thunder shower dampened me. After dinner [lunch], walked to the same place as yesterday [N on the Mt. Vernon Wagon Road]. Found one *halcyone* [unsilvered *hesperis*]. [The lost holotype of *Hemiargus isola*=*alce* was collected in Colorado by Mead, as the *alce* O.D. says “From Colorado, taken by Mr. Mead”. Mead 1876 wrote for *Hemiargus isola* that “A few specimens were taken on Turkey Creek late in June”, but there is no evidence it was July 27 as Calhoun 2015a p. 12 wrote is possible.]

Butterflies collected June 27: *Colias alexandra* female, *Argynnis hesperis* unsilvered one, *Phyciodes pulchella camillus* one male.

Butterflies collected June 21-27: *Papilio eurymedon*, *Papilio multicaudata*, *Papilio polyxenes asterias*, *Papilio zelicaon*?, *Neominois ridingsii*, *Oeneis uhleri*, *Argynnis aphrodite* probably, *Argynnis hesperis hesperis* part-silvered, *Argynnis coronis*?, *Euphydryas anicia capella*, *Poladryas minuta arachne* (or June 5-7), *Chlosyne nycteis drusus*, *Chlosyne palla calydon*, *Euphilotes ancilla barnesi*, *Cupido* “Everes” *amyntula valeriae*?, *Plebejus icarioides lycea*, *Plebejus lupini lutzi*, *Hemiargus isola* (good guess June 23), *Glaucopsyche piasus* (good guess June 24).

Butterflies collected June 21 23 24 27: *Polites mystic dacotah* [lectotype TL designated as Turkey Creek, Jefferson Co. Colo., June 21 23 24 27 in the *Polites mystic dacotah* writeup above], *Nathalis iole*, *Chlosyne gorgone*, *Phyciodes cocyta selenis* abundant.

June 28 Wednesday. Bradford Junction. Very wet & soggy. Got many “*Pieris*1” eggs & larvae [these were *Euchloe ausonides* evidently, NOT *Pieris*1=*Pontia protodice*, because larva description in letter 148 fits *Euchloe ausonides* not *Pontia*]. Packed up. Took stage 38 miles back to Kenosha House but it was loaded with dirty sacks of corn on which we had to lie; reached Kenosha House at 12 o’clock midnight.

Butterflies collected June 28: *Epargyreus clarus* (Sam collected at Bailey?), *Euchloe ausonides* eggs & larvae.

June 29 Thursday. Kenosha House. Went up the second large gulch on the right hand side of the creek [evidently NW up Hoosier Creek 0.8 mile then N up little open valley leading to Dake Lake=Lininger Lake] & found a new *Argynnis* [*Boloria eunomia*]. My collecting was interrupted about 11 a.m. by thunderstorm.

Butterflies collected June 29: *Erebia epipsodea*, *Boloria eunomia*.

June 30 Friday. Kenosha House. Went farther up same gulch as yesterday and found 40 specimens of another new *Argynnis* [*Boloria eunomia* by elimination of all others using Mead 1876] besides other things. Sam and I made a tin turbine, a square tube closed at ends, but it had leaks.

Butterflies collected June 30: *Boloria eunomia* 40 specimens.

Butterflies collected June 29-30: *Pieris marginalis*?

July 1 Saturday. Kenosha House. Worked on the turbine and made the “old thing” work [an irrigation waterwheel?]. Went out and found a *Plusia* moth. Was late to dinner [lunch]. Sam and I went to the deer lick [“camped out at”, letter 148] and at 3 a.m. he tried to shoot a gray wolf but missed.

July 2 Sunday. Kenosha House. Walked up the gulch [evidently southward toward Kenosha Pass] catching butterflies. [Letters 148-149 say he caught an 8” Brook Trout with his butterfly net.]

Butterflies collected July 2: *Euphydryas anicia eurytion* female.

July 3 Monday. Kenosha House. In early morning the dogs frightened away a bear. Went 3 miles down the [Kenosha] gulch [to the current town of Webster] & 1 mi farther down the road [that goes east from Webster to current town of Grant]. Found but few butterflies. [Letter 149 says a

man stole cattle from a ranch owner and Sam at gunpoint, so days later Sam with the Sheriff and two deputies hauled the man to Fairplay for trial.]

Butterflies collected July 3: *Boloria titania helena* paratype male.

July 4 Tuesday. Kenosha House. Read 11 letters the stage brought [no mention of hunting butterflies].

Butterflies collected July 4 (maybe none collected July 4?): Mead supposedly collected lectotype of *Phyciodes pulchella camillus* July 4 (but the date on that label is currently unreadable) and supposedly collected *Euphydryas anicia eurytion* lectotype male labeled “*Melitaea* 1 7/4” and paralectotype female labeled July 4 (Calhoun 2015a figs. 18, 27), even though journal has no mention of collecting any butterflies, so those specimens may be **mislabeled** from July 3 or 5?].

July 5 Wednesday. Kenosha House. Caught a few butterflies. Packed for the stage. Found many *Euptoieta claudia* eggs on *Sedum lanceolatum*. 11 p.m. took stage 26 miles to Fairplay.

Butterflies collected July 5: *Euptoieta claudia* many eggs.

Butterflies collected June 29-July 5: *Colias scudderii* two, *Pontia callidice occidentalis* likely, *Oeneis uhleri* surely, *Oeneis calais altacordillera*?, *Boloria eunomia* a dozen, *Boloria titania helena*, *Plebejus glandon*?

July 6 Thursday. Fairplay. Arrived at Fairplay 4 a.m. and slept a little before breakfast. Sam and I went up Beaver Creek to collect butterflies and found a handsome *Argynnis* [*mormonia eurynome*].

Butterflies collected July 6: *Erebia epipsodea* [*rhodia* lectotype caught July 6], *Argynnis mormonia* 7 specimens, Polyommata blue larva [unknown species] on leguminous plant.

July 7 Friday. Fairplay. Rainy so caught just a few butterflies. Mailed 1016 butterflies and some larvae to Mr. W. H. Edwards.

Butterflies collected July 6(7): *Nathalis iole* one or two seen, *Colias alexandra*, *Oeneis calais altacordillera*?, *Argynnis hesperis* unsilvered?, *Argynnis mormonia*, *Boloria eunomia*, *Euphydryas anicia eurytion*?, *Lycaena rubidus*?, *Plebejus glandon*?, *Plebejus melissa* higher-altitude ssp.

Butterflies collected June 9-12 but more likely July 6(7): *Plebejus icarioides*.

July 8 Saturday. At Fairplay took the stage [an open weekly-mail “hack”, letter 151] for California Gulch & Twin Lakes. On top of [“Snowy”, now Mosquito] Range [at Mosquito Pass for an hour, letter 151] found a lovely *Colias* [*meadii*] & a new *Satyrus* [*Erebia callias*] new to me. A large *Chionobas* [*Oeneis calais altacordillera*] was plentiful. [The 1871 wagon road southwest of Mosquito Pass went from Evans Gulch to just E of Iron Hill, unlike today’s main roads.] After 40 miles the “hack” reached Oro City [new Oro City 2 mi. SE Leadville along California Gulch, just SE of Iron Hill—the old Oro City at SE corner of current Leadville was founded 1860 and mostly abandoned 1864] about 6 p.m. and stayed at a nice house kept by New England people [Leadville is 2 miles away along California Gulch also, so the exact location of that house is debatable. Letter 149 mentions that Oro City once had 5000 inhabitants when \$6 million of gold was placered, but now has but half a dozen houses. Scott’s father’s trail map {Glenn Scott 2004a} reported it once had 10,000 people].

Butterflies collected July 8: *Colias meadii* 11m1f specimens [lectotype collected July 8], *Erebia callias* 6 specimens [lectotype collected July 8], *Argynnis mormonia*, *Euphydryas anicia brucei*?, *Plebejus melissa pseudosamuelis* 1f, *Plebejus icarioides lycea*, *Oeneis calais altacordillera* 11 specimens.

July 9 Sunday. From Oro City, after looking at old drifts [probably placer-mining stone piles, doubtfully lateral moraines, surely not mine shafts] in the gulch, took stage at 9 a.m. 15 miles south to Twin Lakes. Got there about noon [Mead stayed at house just E of the eastern Twin Lake evidently owned by Mr. Derry] and soon found another *Satyrus* [*Cercyonis oetus charon*,

named from Twin Lakes specimens] and another *Hesperia* [evidently *Hesperia uncas* which occurs in brushy grassland habitat]. After dinner [=lunch] walked to the other end of the upper lake on the other side but found little. Sam and Mr. Derry caught many trout.

Butterflies collected July 9: *Cercyonis oetus*, *Hesperia uncas*.

July 10 Monday. Twin Lakes. Started out in morning to look around and [walked SW] finished by getting on top of a peak between 4,000 & 5000 ft. [actually ~3400'] above the lakes. [Letter 151 reported snowbanks, and says "I walked a long distance up a gulch and finally concluded to go to the top of a peak of the Saugwiche {Sawatch} Range {evidently the mtn. 12600' 2.2 mi. NE Quail Mtn., south of the Twin Lakes}. Near the summit I found *Satyrus* 3=*Erebia callias*, a specimen of *Colias* 5=*meadii* & swarms of *Argynnis* 8=*titania* {though many may have been *Euphydryas anicia brucei* which hilltops and was underreported by Mead}. Obtained 16 specimens of a Hesperian {=*Pyrgus centaureae* not *Polites draco*}, letter 151, Mead 1877] Found many nice butterflies & got back about supertime. I had no dinner or lunch and ate much ice and snow. [Letter 153 reports "At the summit there were great patches of snow and basins of ice water."]

Butterflies collected July 10: *Pyrgus centaureae* 16-17 specimens, *Oarisma garita* [two *Oarisma garita hylax* paralectotypes in CMNH were collected July 10 and July 14 at lower altitude, Brown 1964-1987 103:269], *Colias meadii* one, *Erebia callias* few, *Oeneis melissa lucilla* two, 12 *Boloria titania helena* "swarms" [most of those seen were probably *Euphydryas anicia brucei*?], *Euphydryas anicia brucei*?, *Plebejus melissa pseudosamuelis* 2f, *Plebejus shasta pitkinensis* 1, *Plebejus glandon*?

July 11 Tuesday. Twin Lakes. Felt a little stiff, walked around near the house [E of lower Twin Lake] and caught 138 butterflies. Walked about 2 ½ miles above [west] and found someone's lost \$3 copy of Tryon's Terrestrial Mollusca of U.S. part 1, the plates slightly injured by rain. Saw many prairie dogs.

Butterflies collected July 11: *Plebejus melissa pseudosamuelis* (male invalid lectotype + 2m1f).

July 12 Wednesday. Twin Lakes. Sammy and I tried to walk up the mtn. just SE of the peak that I climbed on Monday but it was so steep that we did not reach the top [the top is 12400', 2.5 mi. E of Quail Mtn.—the Leadville 30x60' topographic map reveals that this mtn. is not very steep but it has a very steep clifflike wall on the NW side on the SE side of head of Flume Creek, where letter 151 says they stopped climbing and instead rolled boulders and heard them crash and snap trees and leap through the air for "¾ mile" [exaggerated] down the mountain.] Butterflies were scarce but saw one *Chionobas* 4[=*Oeneis melissa*]. Two young men drowned in the lake.

Butterflies collected July 12: *Polites draco*, *Oeneis melissa lucilla* one seen, *Lycaena rubidus* one, *Euphydryas anicia brucei*?, *Plebejus glandon*?

Butterflies collected July 9-12: *Pontia callidice occidentalis*, *Colias scudderii*.

July 13 Thursday. Twin Lakes. Walked up the head of the upper Twin Lake. Found many *Lycaena* [*rubidus*] etc. Came back at 2 p.m., then Sammy and I caught 21 trout—the largest 1 lb—on the lake].

Butterflies collected July 13: *Lycaena heteronea heteronea*, *Lycaena rubidus sirius* 51m2f [including *sirius* lectotype caught July 13], *Plebejus melissa pseudosamuelis* 1f, *Plebejus icarioides lycea* male. [The lectotype and paralectotype of *Hesperia comma colorado* have a 7-13 =July 13 label from a piece of triangle, but were **misabeled** by W. H. Edwards returning them into the wrong envelope, or maybe mislabeled by Mead writing 7-3 rather than 8-13 [where Mead was at Williams Fork River to Hot Sulphur Springs, in Grand Co. Colo. where ssp. *idaho* flies that often looks like those *colorado* types] on the envelope, because they are paler than the *H. comma colorado* later collected near Twin Lakes, and *H. comma* flies later than this, so the specimen must have been coll. in August in the Front Range or Summit Co. or Middle Park.]

July 14 Friday. Took a lunch and walked over 6 miles west up Lake Creek. Waterfalls and deep trout pools were seen. Farther west is a small park and then thick pine forest. [Letter 151 says I found little.] After starting home got caught in thick clouds and thunderstorm. Walked altogether 16 miles by the road [so went ~8 miles west, toward the *Plebejus melissa pseudosamuelis* type locality].

Butterflies collected July 14: *Boloria eunomia* one, *Lycaena rubidus* one male, *Oarisma garita* [two *Oarisma garita hylax* paralectotypes in CMNH were collected July 10 and July 14, Brown 1964-1987 103:269].

July 15 Saturday. Twin Lakes. Rested and read book, rowed 15 minutes but got tired. [Letter 151 says he stayed in house all day reading.]

July 16 Sunday. Twin Lakes. Wrote letters. [Letter 151 says he shall write letters today.]

July 17 Monday. Twin Lakes. Walked [west] up to Dayton [a tiny town founded in 1860 N of the W end of the lakes near current town of Twin Lakes—Calhoun's suggestion in the journal commentary, that Mead might have misspelled Drayton House, a hotel in the town of Granite {3 mi. SE of Mr. Derry's house} and walked there, seems doubtful, Dayton is UP in altitude, Drayton House is DOWN]. Returned at 2 p.m. for dinner [lunch]. A donkey dragged his owner ~100 yards by the lariat but "nobody hurt". [Letter 153 says Mead shot a Night hawk in the head with a rifle and caught a little ptarmigan in the mts.]

Butterflies collected July 17: *Lycaena heteronea heteronea*, *Plebejus melissa pseudosamuelis* 1f, *Lycaena rubidus* 4m2f.

July 18 Tuesday. Twin Lakes. Walked down the road toward Granite about 1 mile but it began to rain so I returned and read the rest of the day.

Butterflies collected July 9-18: *Hesperia uncas* 31 spec., (the *Hesperia comma colorado* 2m labeled 7-13 were mislabeled), *Polites sonora* several males, *Pieris marginalis* coll.?, *Neominois ridingsii*, *Cercyonis oetus* 70 specimens, *Argynnis hesperis electa* [lectotype came from Twin Lakes], *Euphydryas anicia eurytion* (mislabeled, or *brucei* from alpine zone)?, *Poladryas minuta arachne*, *Lycaena heteronea heteronea*, *Plebejus melissa pseudosamuelis*.

July 19 Wednesday. At Twin Lakes Sam and I packed and waited for a friend, and we took stage 15 miles to California Gulch.

July 20 Thursday. California Gulch. Walked up the gulch and on the mountains. Found another *Argynnis* [evidently *Argynnis mormonia* one unsilvered]. Came back at 2 p.m. and had a cold dinner [lunch].

Butterflies collected July 20: *Erebia callias* one, *Argynnis mormonia* one unsilvered specimen, *Boloria titania helena* some [the lectotype actually had no date so the idea it was collected this day was just a wild guess, and the lectotype could have been collected July 20 or 21 or at many other dates and localities], *Lycaena rubidus* one male.

July 21 Friday. Took the stage pretty early from California Gulch to Fairplay, and on the mountains [Mosquito Pass] caught many of the alpine *Erebia* [*callias*]. After 40 miles reached Fairplay about 5 p.m. in heavy rain.

Butterflies collected July 21: *Colias meadii* 34 specimens, *Erebia callias* 50 specimens, *Argynnis mormonia*, *Boloria titania helena* some, *Euphydryas anicia brucei*?, *Lycaena florus*?

July 22 Saturday. Left Fairplay pretty early on horseback for Montgomery City [a town 2 mi. E of Mt. Lincoln that is now under Montgomery Reservoir]. Found some *Colias* 5 [*meadii*] on the road [evidently N of Alma as this is a subalpine/alpine butterfly]. At about 2 p.m. started up Mt. Lincoln, which was extremely tiresome. We picketed our horses a little above timberline and reached the summit at about 7 p.m. The view was splendid. Sam got an eye ache and as we descended became very sick [from the altitude]. [Letters 158 & 186 say they rode up on a very steep road and picketed the horses and walked up on an ascent that took 6 hours not 2 as they

were told, and then walking down they found the horses had broken loose and disappeared and threw off and lost Sam and Theodore Mead's rubber raincoats, but they fortunately found the end of the road that went halfway up the mountain but had to wade the Platte River and go through some mining ditches.] Finally we reached Montgomery in pitch dark and heavy rain [at ~9:30 p.m.]. I put Sam to bed and after tea went to bed exhausted.

Butterflies collected July 22: *Colias meadii* some, *Erebia callias*, *Boloria titania helena*, *Euphydryas anicia brucei*?, *Lycaena rubidus*, *Plebejus glandon*?, *Plebejus melissa pseudosamuelis* 1m.

July 23 Sunday. Played on the parlor organ an hour. Our horses came back by themselves. Read books nearly all day.

July 24 Monday. From Montgomery City, walked 12 miles south to Fairplay [while Sam rode one horse and tow-roped the other]. Had a long conversation [near Montgomery City at the foot of Mt. Lincoln] with some ornithologists sent out by the museum at Cambridge [the Joel A. Allen expedition]. The walk was tiresome and unremunerative. Helped Sam boil his bear head [the bear someone shot earlier at Fairplay after it broke into a slaughterhouse 3 nights, letter 192].

Butterflies collected July 24: *Cercyonis oetus*, *Plebejus glandon*?

Butterflies collected July 22 & 24: *Lycaena florus*?

July 25 Tuesday. From Fairplay took the stage [26-28 mi.] to Kenosha House. In the afternoon walk found nothing.

July 26 Wednesday. Kenosha House. Hunted for butterflies but found not very many. Placed two *Colias alexandra* females in laying boxes for eggs. Arranged for Mr. Blair to care for larvae etc. [letters 163 & 186 say Mr. French our landlord at Kenosha House brought Sam and I two horses saddles bridles for \$200 and his fee of \$25; Mead's was a pretty black pony mare of the Comanche Indian breed he named Comanche.]

Butterflies collected July 26: *Colias scudderii*, *Colias alexandra* egg.

July 27 Thursday. At Kenosha House placed *Sedum lanceolatum* and 60 *Parnassius phoebus* eggs in a box. Mailed 1 ½ lbs. of *Sedum* to W. H. Edwards, and 2 lbs. of cactus to home [New York City]. At noon rode new pony 21 miles downriver to Mr. Bailey's [now town of Bailey], reaching there ~5:30 p.m. It rained hard on the way.

Butterflies collected July 26-27: *Lycaena florus*?

Butterflies collected July 27 or Aug. 28: *Colias meadii* one specimen at Kenosha House.

July 28 Friday. At Mr. Bailey's [Bailey] about 8 o'clock [a.m. I think] mounted my steed—a very lazy one by the way—and rode 17 miles to Bradford Junction, arriving at 12 M[idnight]. In the afternoon walked up a gulch [maybe near Pine Jct.] and got some [*Argynnis*] "*Hesperis & Halcyone*" [part-silvered *hesperis* & unsilvered *hesperis*]. Felt pretty stiff and tired. [I think Calhoun's 2015a interpretation that Mead started at 8 p.m. and earlier collected in Bailey is wrong, because he wrote about the trip before the afternoon collecting, and maybe he wanted to sample a new area?; I think he started at 8 a.m. and got stiff and tired by collecting in afternoon plus the long hours of riding up and down ~5 canyons on a slow {tired} horse in the dark.].

Butterflies collected July 28 at Pine Jct.: *Argynnis hesperis hesperis* part-silvered some, *Argynnis hesperis* unsilvered some.

July 29 Saturday. Bradford Junction. Walked down the road [ENE to South Turkey Creek Can.—letter 177 says Turkey Creek] and found several "*Halcyone* [unsilvered *hesperis*] but only one *Hesperis* [partly silvered]". In afternoon loafed around the shingle mill watching.

Butterflies collected July 29: *Papilio multicaudata*, *Papilio polyxenes asterias*, *Argynnis aphrodite* probably, *Argynnis hesperis* unsilvered several, *Argynnis hesperis hesperis* part-silvered one, *Lycaena rubidus* 2 females.

July 30 Sunday. Bradford Junction. About 9 a.m. Sam and Mr. French [letter 151 says Mead arranged with Mr. French at the Kenosha House weeks before to buy horses for their trip to Middle Park] rode up, and after an hour we all rode toward Denver and enjoyed the splendid view of the plains. Got 2 quarts milk at a “milk ranch” [dairy] 6 mi. W Denver. Reached Denver about 4:30 p.m. as it began to rain. [No mileage listed.]

July 31 Monday. Denver. Sam paid Mr. French \$105 [for the two horses etc.]. Bought shoes, supplies for horses including spurs, lariats, cinch, plus California blankets, butterfly netting etc. Butterflies collected June-July: *Pyrgus communis*.

August 1 Tuesday. Denver. Bought more stuff, ordered some insect hatching [rearing?] boxes for Mr. Blair. Mailed butterflies in cigar boxes [the smell evidently deters pests].

August 2 Wednesday. Denver. Packed in hot weather for horse trip. At 4 p.m. Sam and I started west on horses loaded with meal bags full of traps. After 12 miles stopped for night at Apex Gulch [then a settlement of Apex at the base of the Front Range just S of Golden--Heritage Square is located at the base of Apex Gulch, not at the head as Calhoun {2015a} stated]. [This entry in the journal was written then scratched out because Mead forgot to write the Aug. 1 entry, then he wrote both.]

August 3 Thursday. Rode up Apex Gulch early but Sam found he had left his watch and went back for it on my pony. I caught butterflies, finding many *Thecla*'s [*Strymon melinus*, *Satyrrium titus*, *S. saepium*, caught in Apex Gulch along the wagon road or on top of Lookout Mtn.—Mead 1876 writes “on the Georgetown road” for *melinus*, “near Apex Gulch” for *saepium*, and “at Apex Gulch” for *titus*, but letter 177 says they all came from the same place]. Ate dinner at Wilson's [12 mi. E Idaho Springs, approximately at today's El Rancho] about 3 p.m. and rode on and got to Idaho Springs just at dark, and stayed at the “Springs House”. Rode my horse “Comanche” 23 miles total today.

Butterflies collected August 3: *Cercyonis pegala nephele* two, *Satyrrium titus* few, *Satyrrium saepium* 50 specimens, *Strymon melinus*.

August 4 Friday. Idaho Springs. Swam in 92°-105°F hot calcareous-encrusting mineral springs pool [40x30x5' says letter 186]. We “staid” in 1 hour 20 min. After dinner [lunch] rode 14 miles to Georgetown and met Mr. Morris [who traveled with them through Middle Park and back] who let us use his hotel room. Ordered saddlebags made [letter 158 says all their stuff for the trip to Middle Park had to be placed into two saddlebags {per horse evidently}].

August 5 Saturday. Georgetown. Started early [and rode several miles south then up Leavenworth Creek on the Georgetown and Ten Mile Road] and crossed the Atlantic/Pacific divide near Gray's Peak [at Argentine Pass 13207' 2 mi. ESE Gray's Peak], caught some butterflies [*Plebejus shasta pitkinensis* and *Erebia callias* on Argentine Pass]. Dined [lunch] at Montezuma and reached cabin on Snake River [probably at Dillon—now under the Dillon Reservoir & dam] in the dark [barely found it using light shining between its logs, letter 186] and met the hunter [guide] for our trip. Rode 32 miles today.

Butterflies collected August 5: *Parnassius phoebus hermodur*, *Colias meadii*, *Erebia callias*, *Euphydryas anicia brucei*?, *Lycaena florus*?, *Plebejus shasta pitkinensis*.

August 6 Sunday. Dillon. Hunted butterflies and found a new *Argynnis* [silvered *Boloria selene*], while Mr. Morris went with the hunter [guide, evidently Mr. Walker] to Breckenridge for supplies [20 miles, for sugar, condensed milk, flour etc., letter 186]. Ate slapjacks and “long sweetening.” (Letter 177 says the envelopes containing *Parnassius* and *Plebejus shasta* collected on August 5 at Argentine Pass were mistakenly marked 8-6 instead of correctly marked 8-5.)

Butterflies collected August 6: *Boloria selene tollandensis* 6 or 7 specimens.

August 7 Monday. Dillon. Looked for butterflies briefly and found an *Argynnis* 11 [*Boloria selene*]. My slapjacks failed so I made griddle cakes. Mr. Morris and Walker [evidently the guide] came near evening.

Butterflies collected August 7: *Boloria selene tollandensis* one, *Lycaena rubidus* 1f.

August 8 Tuesday. Dillon. [Letter 186 says: In early morning the disagreeable hunter/guide shot two fine deer at a nearby lick, making good venison. We were amused at the guide's ill nature. {Must have taken several hours to butcher the deer.}] Started ~11 a.m. [riding along Blue River, evidently on the west side for ~10 miles] and the hunter [guide] went ahead so we were perplexed as to which trail to take and did not catch up with him until 10 miles. Camped in a little park after 12 miles [total], [and made a big fire the guide growled about because Arapahoe indians on the war path might have seen it, letter 186], slept on willow branches.

August 9 Wednesday. Started early and rode ~12 miles before dinner [lunch] along the Blue River. In afternoon a man across the [Blue] river asked if he could run a wagon on our side and told us there was a direct trail to the Hot Springs on the other [evidently east] side, so we crossed the river and rode ~5 miles and camped. It soon rained and rained until ~2 a.m. [when we made a big fire to dry clothes, letter 186.] Caught some pretty moths which came to the camp fire. Rode my horse Comanche 25 miles today.

August 10 Thursday. Rode several miles and camped near mouth of Blue River on the Grand [now Colorado] River in a wide grassy [flood]plain [just SE current town of Kremmling]. Mr. Morris [traveling with them since Georgetown] caught a 3 lb. trout and others. I cooked a peeled prickly pear leaf [*Opuntia* cactus, called nopal] which was not good. Rode Comanche 12 miles today.

Butterflies collected August 8-10: *Parnassius phoebus smintheus*.

August 11 Friday. Started after 11 a.m. and rode very slowly up Grand [Colorado] River to Williams Fork [a river] and camped at splendid place [4 mi. WSW current town of Hot Sulphur Springs]. About midway passed cattle ranch where the Arapahoes [indians] burned the cabin and murdered the settlers last summer [but left the cattle and cellar and hand cart.+Beavers had cut down 2 ft. trees including one that lodged on another tree.+Letter 186]. Caught one trout. Rode horse Comanche 11 miles today.

August 12 Saturday. Hunted butterflies but soon a windstorm came up and sky clouded over so caught few. Cooked some barrel cactus which tasted like eggplant when boiled then fried.

August 13 Sunday. Walked 1-2 miles up Williams Fork before breakfast to catch trout but caught none. Took a dip in the water but it was very cold. Rode over to the Hot Springs [now Hot Sulphur Springs]---~6 miles [4-5 miles, letter 186; 4 mi. by air]. Rode Comanche 6 miles today.

Butterflies probably collected August 13: *Hesperia comma idaho*, based on this evidence: The two *Hesperia colorado* types were mislabeled 7-13, and were likely collected 8-13 near Hot Sulphur Springs because Mead miswrote 8-13 as 7-13 (these butterflies fly in August 13 in Colorado but not July 13). Scudder {1874} wrote that "Mr. Mead took fresh specimens during the second week of August", which information may have come from Mead himself, as Scudder visited Mead and got specimens including the *Hesperia nevada* lectotype from Mead. (See the *Hesperia comma idaho* text above).

August 14 Monday. Hot Sulphur Springs. Bathed in the hot springs before breakfast but felt like a boiled lobster. [Letter 186 says the water in the rock basin was too hot and sulphurous to be pleasant, and the Denverite who appropriated the spring charges necessities of life at 200% the cost. Letter 180 complains that Middle Park contains no game except sage hens {grouse} and trout.+Water froze in our pails while camping out at night.+All the fruit in the market comes from California.] Walked towards the agate [a billowy quartz mineral] patch hunting butterflies by the way, but found no good agates. [Calhoun wrote in journal there is a large agate field on a



sage flat SW of Colorado X Williams Fork rivers but Mead doubtfully would have walked 4 mi. to get there—agate is common in Middle Park]. Sam and Mr. Walker [the hunter and guide] came on horseback and I walked back with them.

Butterflies collected August 14: *Boloria bellona* one.

August 15 Tuesday. From Hot Sulphur Springs started riding early for head of [Middle] Park and rode 24 miles, camping at a cabin [near the current town of Fraser by the miles traveled between Hot Sulphur Springs and Georgetown]. At noon the guide wanted to halt and started unpacking the jacks [male donkeys] but we rode right on and he soon followed cursing, swearing and beating his animals. Rode Comanche 24 miles today.

August 16 Wednesday. Near Fraser. Started early again along the Fraser River and reached Berthouds [Berthoud] Pass at 2 p.m., where we stopped and bought elk meat from campers [implying they took little of the 2 deer shot August 8—although elk tastes better]. A little before [north of] reaching the pass I caught 15 specimens of a *Grapta* new to me [*Polygonia faunus hylas*]. Reached Georgetown ~7:30 p.m. and stayed at Barton House [Letter 186 says it is the best hotel yet found in Colorado, but \$2 a day for horse's board and stabling.]. Rode Comanche 24 miles today. [Letter 186 says the week before a horse panicked and was converted to hash on the rocks 300 feet below, which had to happen on the southern end of the cutoff road Mead surely took going due S of Empire over Empire Pass {which is W of Douglas Mtn.} to Georgetown, specifically SW of Douglas Mtn. {the dirt road with fitted-stone foundation now closed to vehicles on the steep E-facing steep slope above I-70}. Letter 186 also states We dismissed the hunter/guide who had been amusing us by punching his horse with his musket and breaking clubs over his jack's {male donkey} ears because we refused to make a noon halt one day and he went off swearing as usual with original and heartfelt oaths that often made us laugh.]

Butterflies collected August 16: *Parnassius phoebus hermodur*, *Polygonia gracilis zephyrus* few, *Polygonia faunus hylas* 15 specimens including lectotype.

Butterflies collected August 6-16: *Hesperia comma* surely (Mead may have collected the two *Hesperia colorado* types on Aug. 13 and mislabeled them 7-13 instead of 8-13, as Scudder 1874 p. 342 wrote that Mead took fresh specimens of *H. colorado* during the second week of August), *Cercyonis oetus*, *Argynnis mormonia*, *Lycaena rubidus*, *Lycaena florus?*, *Plebejus glandon?*

August 17 Thursday. Georgetown. Stayed in hotel writing letters and reading.

August 18 Friday. Georgetown. Before leaving toured the Burleigh Tunnel where they use the compressed-air Burleigh Drill [to drill holes into rock {and breathe the dust and get silicosis}, then the holes are filled with dynamite to blast the rock into bits]. From Georgetown rode Comanche 15 miles to Idaho Springs, where I took a bath and found many moths in the room.

Moth collected August 18 (Idaho Springs): *Oncocnemis meadiana* H. K. Morrison, 1875 (Noctuidae) was named by Morrison (1875) from “Hab. Colorado, Aug. 18 (No. 47, Mr. T. L. Mead).”

August 19 Saturday. Rode [east] from Idaho Springs pretty early. Caught some butterflies on the way and saw a *Danaus berenice* [*Danaus gilippus*]. Dined [lunch] at “Wilson's” [12 mi. E Idaho Springs, about at current El Rancho]. Stayed “staid” overnight at Apex Gulch without supper. Rode Comanche 23 miles today.

Butterflies collected August 19 (~Idaho Springs): *Hesperia comma ochracea* 1m, *Ochlodes sylvanoides napa* 1m, [*Ochlodes sylvanoides napa* neotype is an Edwards' collection specimen labeled only “Colo” that F. M. Brown thought was collected by Mead, and Mead {1876} wrote that he collected *napa* “in the vicinity of Georgetown” but it was evidently collected near Idaho Springs], [The *Polites mystic dacotah* holotype from “Colorado” collected by Mead was mistakenly claimed by authors including Scott 2008 and Calhoun 2015a to be also coll. from Georgetown or E of Idaho Springs, but was not mentioned by Mead 1876 and cannot have been

collected here because it does not fly in August. Above in the Butterfly Taxa section the TL is corrected to South Turkey Creek June 21 23 24 27.], *Danaus gilippus thersippus*, *Argynnis hesperis* unsilvered. Letter 180 mentions "Hesperians (Skippers)" that he labeled "B" or "C" evidently collected Aug. 19-20 from Idaho Springs to Apex Gulch, whose identity is unknown (*Hesperia comma*?).

Butterflies collected August 18-19: *Hemiargus isola*.

August 20 Sunday. Rode from Apex Gulch 8:30 a.m. and arrived in Denver 11:30 a.m., stayed "staid" at Am[erica] House as usual [their horses were stabled evidently]. Read in afternoon.

Rode Comanche 14 miles today.

Butterflies collected August 20: *Poladryas minuta arachne* one near Denver.

August 21 Monday. Denver. We [Mead and Sam] visited the Denver Rio Grande Railway [yard] and inspected the rolling stock, very nice. Got letter from home enclosing \$500 in circular notes.

Worked on letters and received my nets, photographs and some papers.

August 22 Tuesday. Denver. Made a few purchases, paid \$10 for Colorado photographs, and withdrew \$150 from the bank. In afternoon we packed up.

August 23 Wednesday. Denver. Withdrew \$100 more finishing my letter of credit. Started from Denver ~11 a.m., near the mountains we continued riding in heavy rain and finally stopped at "Reid's Mills" [spelled Reed Mill by Calhoun 2015a][somewhat near Evergreen] where vast quantities of bedbugs entirely prevented sleep except for 2 hours in the morning [evidently after light shone in and the bedbugs crawled into the dark]. Rode Comanche 24 miles today.

August 24 Thursday. Left "Reid's Mills" and rode to [Bradford] Junction where we had a particularly bad dinner [lunch] and suffered from indigestion the rest of the day and tomorrow.

Rode to Mr. Bailey's [Bailey] arriving after 9 p.m. where they were full but finally we slept on the boy's bed and they slept on lounges. Rode Comanche 22 miles today.

August 25 Friday. Bailey. Sam and the two boys [Mr. Bailey's] went trout fishing. I followed about 2 miles but was too sick to continue. Caught a rare *Thecla* [*Lycaena arota*]. Walked back and read.

Butterflies collected August 25: *Lycaena arota*.

August 26 Saturday. Bailey. Caught a new *Satyrus* (5) [*Cercyonis meadii*, Mead caught 49 here].

About noon we rode 21 miles to Kenosha House. Caught a few *Argynnis edwardsii*. Inspected Mr. Blair's entomological efforts [tending larvae etc. [Letter 194 to W. H. Edwards complains that Blair lacks the accuracy necessary for scientific work, but letters 198-199 request that Edwards' Part I & II Butt. N. Amer. be sent to Blair in exchange for Blair's captures next year, then letter 208 tells W. H. Edwards that Blair let some *Hemileuca nevadensis*="Saturnia maia" black larvae starve, and asks Edwards to not send issues of Butt. N. Amer. past volume II to give Blair incentive to catch more butterflies.]

Butterflies collected August 26: *Cercyonis meadii* 49 specimens [including lectotype] at Bailey, *Argynnis edwardsii* Kenosha House, *Nymphalis antiopa* Kenosha House.

Butterflies collected August 25-26: *Argynnis hesperis* unsilvered female?

August 27 Sunday. Kenosha House. Went out before breakfast and looked around but saw almost no butterflies. Afterwards caught a *Colias alexandra* and 4 *Satyrus* 4 [*Cercyonis oetus*] females and set them in laying boxes to get eggs [letter 185 says the pigs rooted through the fence and ruined the previous *alexandra* laying boxes, and writes that the aspect of the country would indicate October and the weather is too cold.]. Mr. Blair caught a female *Colias scudderii* which I set in laying box for eggs. Our horses disappeared and Mr. Blair spent the day hunting for them.

Butterflies collected August 27: *Colias alexandra*, *Colias scudderii* female, *Cercyonis oetus* 4 females, *Argynnis mormonia*.

August 28 Monday. Filled pockets for long trip and walked down the road [down Kenosha Gulch NE then E—Mead {1876} says 20 miles from South Park] and found a “pocket” of over 20 *Graptas* [*Polygonia faunus hylas* & *Polygonia gracilis zephyrus*] in one spot [at Shawnee on the North Fork of the South Platte River]. [Before finding the *Polygonia*] Dined [lunch] at Hepburn’s 8 mi [actually 6 mi., at current town of Grant]. Stayed overnight at Slaght’s 16 miles [actually 12 mi., now the town of Shawnee] from [E of] the Kenosha House.

Butterflies collected August 28 NE of Kenosha House to Shawnee: *Hesperia comma* near-*ochracea* 1m at Grant, *Colias meadii* one (July 27 or Aug. 28 at Kenosha House), *Polygonia gracilis zephyrus* ~30 at Shawnee, *Polygonia faunus hylas* 20 at Shawnee.

August 29 Tuesday. After breakfast walked down [ESE] to Bailey’s 5 mi. [Bailey, actually 4.5 mi.] and hunted butterflies. In afternoon found 3 specimens of new *Thecla* [*Lycaena arota*].

Butterflies collected August 29: *Lycaena arota* 3 specimens.

August 30 Wednesday. Bailey. Caught more butterflies. A heavy thundershower came about noon but I fortunately reached the house before it rained hard. Caught many beetles etc. especially in afternoon.

Butterflies collected August 30: *Hesperia comma* near-*ochracea* 1m.

August 31 Thursday. Bailey. Walked down on the sunny (right hand side [evidently S side of slightly-ESE-flowing river to get morning sun]) of the Platte and caught very large number of *Thecla* 7 [*Lycaena arota*]. Read in the afternoon, tried drawing, and wrote letter.

Butterflies collected August 31: *Lycaena arota* very large number.

Butterflies collected June-August: *Coenonympha tullia ochracea*.

September 1 Friday. Bailey. Walked on the right hand side [evidently S side] of the Platte after making a spreading board for Joe Bailey. Found little. Walked on the other side also and found some more. Spread some butterflies for Joe. Took stage 21 miles to Kenosha House and arrived at midnight.

Butterflies collected September 1: *Lycaena arota*.

Butterflies collected August 25-26 & 29-Sept. 1: *Colias eurytheme*, *Cercyonis meadii* (esp. Aug. 26, total 49 specimens), *Argynnis hesperis hesperis* unsilvered “*Halcyone*” female (evidently caught at Bailey Aug. 24-26 or 29-Sept. 1) in laying box to get eggs (Journal September 3), *Polygonia gracilis zephyrus*, *Nymphalis antiopa*, *Vanessa virginiensis*, *Lycaena arota* (15m75f Aug. 25-Sept. 1), *Lycaena florus*?

September 2 Saturday. Kenosha House. Felt not very well. Loafed and read.

September 3 Sunday. Kenosha House. Read. Placed female *Argynnis* 9 [*mormonia*], *A. “halcyone”* [unsilvered *hesperis*], and Sat 5 [*Cercyonis meadii*] in laying boxes to get eggs. Walked around with butterfly net but found nothing.

Butterflies collected September 3: *Argynnis mormonia*.

September 4 Monday. Kenosha House. Sam hunted deer after breakfast and returned after 3 p.m. and brought me a very tame sort of butcher bird and I made it a cage. The *Argynnis* 9 [*mormonia*] had laid some eggs in laying box.

September 5 Tuesday. Kenosha House. Tried to catch blackbirds and chipmunks by pulling away the support under boxes but failed to catch any. [Must be getting bored.]

September 6 Wednesday. Kenosha House. Tried various devices to capture birds that failed. Mr. French took Sam’s pony to Hamilton to try to sell it.

September 7 Thursday. Kenosha House. Sent eggs of *Satyrus* 5 [*Cercyonis meadii*] and “*Argynnis Halcyone* [unsilvered *hesperis*]” to Mr. [W. H.] Edwards. Toward evening went with Sammy down gulch after rabbits & saw 3 but shot none.

September 8 Friday. Kenosha House. Rained nearly all day. Wrote to Joe Bailey enclosing insect pins. Mr. French paid us \$60 for the horses [including Mead’s horse Comanche] which along

with board makes \$100 as we agreed [letter #186 says Mead wanted \$50 for Comanche which cost \$87.50].

September 9 Saturday. Kenosha House. Put my butcher bird in another cage. Rained in sloppy cold weather all day long, so I read.

September 10 Sunday. Kenosha House. The day started bright and sunny. I walked down the gulch [evidently NE down Kenosha Gulch] a mile and caught several Diptera. I stuffed a bird's head the cat killed, for a man's daughter. Rained hard in afternoon.

September 11 Monday. Kenosha House. Rained in morning. I packed and got *Aquilegia* and other roots to mail home. Dime size hail in afternoon, one went down my neck. At night took the stage 28 miles to Hamilton [1.5 mi. NW Como].

Butterflies collected September 3-11: *Vanessa virginiensis*? maybe.

September 12 Tuesday. Arrived at Hamilton about 5 a.m. in South Park, which was covered by 2-3" of snow. Arrived at Fairplay for late breakfast and finally took the Cañon stage. Stopped at station 39 [Hartsel] and was sick in the night. Took stage 41 miles today [since Kenosha House, actually ~47].

September 13 Wednesday. Hartsel. Felt not quite well. Our host Mr. Powers returned from an election with Mr. Costello [Judge James Castello] and gave me fossil Diptera from the petrified stumps where Mr. C. lives [Florissant], so arranged to hire a horse and go by horseback with them 30 miles to get more fossils. Sammy went with Powers Jr. to hunt antelope at a ranch. [Letter 203 says the butterflies have nearly disappeared and leaves were falling and Mt. Lincoln had snow, and writes that water has been deficient for the previous two years {though in 1871 earlier letters and journal talk about frequent rains, and weather records and tree-ring widths say 1871 was not a drought year, as detailed for June 13 above.}]

September 14 Thursday. Hartsel. Rode [due E] to a ranch with Mr. Costello [Castello] and Powers Jr. and met Sam and saw a prairie wolf [coyote] and a badger who retreated before a gun could be brought. Sam and I took a walk and I had Mr. Powers' shotgun and killed some small birds I didn't stuff. [In the late 1800s people blasted away at every large animal they saw, so by 1900 nearly all the large animals in the U.S. had been exterminated, and now those species that were not rendered extinct in the carnage are recovering.] Rode horseback 9 miles today.

September 15 Friday. Rode over through woods & gulches 21 miles to Mr. Castello's [at Florissant] early in evening. I went to shale bank near house but found nothing good [even the shale banks along current Hwy 24 in town have fossils observed there by Glenn R. Scott & James Scott].

September 16 Saturday. Florissant. Got directions and walked [S] toward the fossil stumps & shale beds but missed them and went ~2 miles too far, finally found them and split the shale and found 2 insects. Returned for dinner [lunch] then went back with hoe and shovel and found 8 more.

September 17 Sunday. Florissant. Went with another man who showed me other shale beds, found many insects [letter 208 says he found fossil Diptera mosquitoes bees wasps lice aphids etc. but no Lepidoptera in a ton of shale. Letter 208 says "We had to remain a whole week for the next stage so I improved the time by hiring a horse and riding to the Petrified stumps where fossil insects are occasionally found in the shale."]. In afternoon read. Judge Castello returned from Platte [the South Platte River 4.5 mi NW] with many trout. Rode horse 2 miles today.

September 18. Monday. Florissant. Judge Castello made a crude map of my route which helped me greatly. Went to petrified stumps and collected 25 lbs. [Letter 203 says the stumps were up to 20 feet across and he found nearly 25 fossil insects.] Got a lunch and rode [S] to Litts Ranch and met Sammy fishing [at Fourmile Creek] on the way [evidently rode due S along modern CR1 and CR11 {near Fourmile Creek for the last part} then west on Guffey Road CR 112-102 along West Fourmile Creek]. Rode horse 23 miles today.

Butterflies collected September 15-18: *Colias eurytheme*.

September 19 Tuesday. [West Fourmile Creek in SE Park Co.] Went with Litts to see him measure hay [surely along West Fourmile Creek] then he took us halfway home and told us it was within 1 ½ miles home, then left and took the horse he had lent Sammy, but we walked and rode all around a mountain [McIntyre Mtn. 9515' seems likely, the only small lone mountain in the region] 2 miles ahead down the road to the divide and back again. Finally the stage came along for the remaining mile comfortably. We had left 2 overcoats so Sammy paid a man \$5 to go down to Litt's and bring them in time for the stage. Rode horse 10 miles today. [The journal reads like they made little headway today. They evidently stayed overnight near roads CR102xCR59=Thirtynine Mile Rd.]

September 20 Wednesday. NE of Guffey. Rode down to Cañon [City] in the stage 39 miles and had a vegetarian dinner [lunch] on the way. [Calhoun 2015a p. 18 suggests Mead went from Florissant to Colorado City=Colorado Springs then took the stage SW to Cañon {City}, but the journal makes no mention of Colorado City, and there is no single "mountain" on that route, and Mead's journal mileages are too small for them to have taken that route. The mileages 23 & 39 match a trip through less-populated areas requiring the map drawn by Judge Castello, from Florissant south and west to Litts Ranch including west on the Guffey Road along West Fourmile Creek past McIntyre Mtn., then on the Fairplay and Cañon City Stage Road going along Currant Creek SE to Cañon City {the same trip along Currant Creek shown on the map of Brown 1956}. Letters 180 & 199 do not mention Colorado City for their future trip to Fairplay, Pueblo and Cañon City. More factoids: On May 10, 1871 the Tremayne #1 ditch was registered as the oldest water right on West Fourmile Creek in Park Co., maybe irrigating Litts' hay?; judge Castello evidently knew Litts and directed Mead to his ranch and maybe even helped with that ditch registration?; Judge James Castello registered Park Co. land filings on Dec. 6, 1862, June 3, 1863, and July 30, 1870, and F. M. Brown {letter 204} notes that the Castello Ranch was platted as Florissant in 1871. {I have not found Litts' name in South Park records including various maps in the Park County records office in Fairplay showing ownership of the lots in that area, so maybe Litts was just a manager employed by a ranch owner.} Finally, Mead could not have gone {from Florissant} to Cripple Creek then due S to Cañon City (the Shelf Road) as people do today because the Phantom Canyon road was only completed in 1892 by Cañon City.]. Near Cañon saw curious cacti [Cholla, plus a natural spring of soda water, letter 203]. Cañon Hotel had bedbugs.

Butterflies collected September 20: *Argynnis coronis*.

September 21 Thursday. Sammy and I went up Arkansas [River, probably to the canyon just westward], he fishing I butterflying. Found nothing of consequence. After dinner [lunch] obtained three varieties of *Opuntia* (Prickly Pear) and a branching kind 3-4' tall (Cholla).

September 22 Friday. Took stage 45 miles over monotonous plain to Pueblo. A cinnamon bear had been killed at the dinner [lunch] stop. After a wheel came off and the mules ran away the damage was fixed and we reached Pueblo at ~5 p.m.

September 23 Saturday. Walked around Pueblo a little and found some flower seed. At 2 p.m. took the stage 45 miles to Colorado City, arriving at 9 p.m. The hotel was not clean or good looking.

September 24 Sunday. Colorado City [Springs]. Saw reddish sandstone formations at Garden of the Gods, went up a small brook and observed a deep rock basin [Devil's Punch Bowl in Queen's Canyon] and 30 ft. [water]fall. Took [night] stage 75 miles to Denver.

September 25 Monday. Reached Denver at 11 a.m., packed partially, got shave and bath, luxuriated eating California pears.

September 26 Tuesday. Mailed my 23 lbs. cacti, packed up, and sent the black trunk home \$32.

Butterflies collected in Colorado with no date: *Danaus plexippus*?, *Vanessa cardui*.

September 27-28 Wednesday-Thursday. Took train to Cheyenne Wyo. and across the desolate bitter creek country to Ogden Utah, went through Weber & Echo Canyons [where letter 205 mentions rock formations like forts & castles], 659 miles total from Denver to Salt Lake City Utah, arrived late Thursday evening.

September 29-Oct 1. Salt Lake City. Walked about town, saw the Temple, went to theatre & saw 17 of Brigham Young's children. Some of his daughters were quite good looking. Took steamer [paddleboat evidently] 8 miles down Jordan [River] and hunted insects while Sam tried to shoot birds with pistol and let some boys fire his pistol [Sam was evidently careless with guns and later died of an accidental self-inflicted gunshot]. Went to [Mormon] Tabernacle and an Episcopal church.

October 2 Monday. Salt Lake City. Sammy and I drove buggy to Hot Springs Lake, rowed and Sammy shot a duck, I hunted butterflies while he shot at terns etc. Buggy trip totaled 8 miles.

Butterflies collected October 2: *Hesperia juba* 1m2f coll. at Hot Springs Lake (all paralectotypes in MCZ, 1m1f fig. by Scudder 1874 pl. X figs. 19-20), *Brephidium exilis*.

October 3 Tuesday. Salt Lake City. Drove in buggy to Great Salt Lake and took a swim & floated high. After dinner [lunch] I captured lizards. Buggy total 45 miles.

October 4-6 Wednesday-Friday (no Oct. 5 entry). Salt Lake City. Tried to buy Book of Mormon, went to museum. Took railroad to Ogden and San Francisco, arrived in evening Oct. 6, 915 miles total. [Letter 220 writes that most of the way from Denver & Nevada looks desolate and unproductive and the Coast Range looks like a heap of mud pies from clam-shell molds.]

Butterflies collected October 6: *Cupido* "Everes" *comyntas* evidently in Sacramento Valley [probably Sacramento] during train stop (letter 220).

October 7-8 Saturday-Sunday. San Francisco. Visited Woodward's Gardens. Saw large plants.

October 9 Monday. San Francisco. Gave Colorado specimens to James Behrens. Henry Edwards gave me a very large number of California butterflies new to my collection and showed me specimens I had just collected in Colorado [moths?] that W. H. Edwards had mailed him [letter 220 says those specimens looked quite unfamiliar to Mead, and lists more specimens traded between Mead and Henry Edwards/Behrens/Behr]. Visited Herman H. Behr and talked German.

October 10 Tuesday. San Francisco. Saw Dr. Behr's collection, he gave me some specimens. H. Edwards came and I gave him some specimens and Sammy and I saw his collection. I went with H. Edwards to James Behrens who gave me a lot of things including 2m [*Zerene*] *eurydice*.

October 11 Wednesday. San Francisco. Got \$200 from bank and wrote home for more \$.

Butterflies collected October 7-11: *Vanessa carye*.

October 12-15 Thursday-Sunday. Took [paddleboat] steamer up San Francisco and San Pablo Bays 120 miles to Stockton, took RR 23 mi. to Burnett's, then took stage 43 mi. including a jirkey 15 miles, the stage 27 mi. to Stockton then stage to Hodgsons and Tamarack Flat then horses 10 miles to Big Trees & saw giant pines near Yosemite including a dead one 36 ft. in diameter, saw Yosemite Valley & El Capitan (the falls dry).

October 16-18 Monday-Wednesday. Yosemite. Horseback 8 miles, visited Half Dome and rolled enormous rock down cliff, saw Vernal Fall, horseback 14 miles, Glacier Point & Inspiration Point, up Hutchings Creek, horseback 22 miles.

October 19 Thursday. Yosemite. Found very few butterflies or ferns on rocks at the foot of precipices.

October 20-22. Yosemite. Caught many small orange *Colias* [*eurytheme*] Oct. 20, Oct. 21 found few *eurytheme* on both sides of Merced [River]. Oct. 22 caught a *Thecla* [*Strymon melinus*?] on way out from Hutchings' on horseback. Horseback 10 miles stage 57 miles past Big Oak Flat to Chinese Camp ~11 p.m.

Butterflies collected October 20-22: many *Colias eurytheme* Oct. 20-21, *Thecla* [*Strymon melinus*?] Oct. 22.

October 23 Monday. ~Chinese Camp. Caught a *Junonia coenia* and gathered *Pinus coulteri* nuts, Sam shot a plover.

Butterflies collected October 23: *Junonia coenia* one.

October 24-26 Tuesday-Thursday. Took stage 48 miles to Big [Sequoia] Trees, stage 45 miles to Milton, RR [railroad] 30 mi. to Stockton, steamer 120 mi. to San Francisco, arrived early in morning Oct. 26.

October 27-November 2 Friday-Thursday. San Francisco. Visited Henry Edwards and Mr. Behrens was there. Mr. H. Edwards had spread many of my Noctuidae. Oct. 28 H. Edwards gave me fine Bombycidae & showed me Panama insects. Sammy received \$1000 in circular notes from their father. Oct. 30 withdrew \$400. from bank & paid \$100 each for ship passage. R. H. Stretch visited & saw my rare *Ctenucha cressonana*. Oct. 31 Stretch showed us his collection and Bombycidae, and gave me some good insects. Watched seals & pelicans and ate oysters at the "seal rocks". Nov. 2 visited H. Edwards who showed me Fiji insects, and Stretch called and I gave him the *Ctenucha cressonana* in exchange for "*Halisidota*" [*Lophocampa maculata*] *agassizii*.

November 3-16. Took steamer Constitution to Costa Rica.

November 17 Friday. Reached Punta Arenas [Puntarenas, Costa Rica] where the agent instigated by the purser refused to endorse my ticket or permit me to stay over in Costa Rica [letter ~221 says the agent wanted \$310 extra fare to stay over], so I went ashore for a short time and caught butterflies & ate coconuts, saw living *Cereus* [cactus] hedges & big lizards.

November 18-20 Saturday-Monday. On steamer to Panama City. Went ashore quite early and got permission from steamship company agent to stop over in Panama, and caught butterflies and before breakfast caught a beautiful *Morpho* in the town itself.

Butterflies collected November 18-20: *Morpho* one.

November 21 Tuesday. Panama City. Went to moat and caught many butterflies among vines & weeds. Returned for breakfast at 9:30 and walked toward RR track finding some good things before and after a hard rain.

November 22 Wednesday. Panama City. Walked along RR track but it was too hot so returned after going 3-4 miles and caught little.

November 23 Thursday. Panama City. Walked [west] on a path nearly parallel with the bay in the woods & found many splendid butterflies. Bought limes.

November 24 Friday. Panama City. Sam and I hired a boat and guide and went "alligator" hunting on Rio Grande, only saw 2-3. Sam shot a snowy egret, we bought coconuts & drank the milk, chewed sugarcane.

November 25 Saturday. Panama City. Walked west on same road as Thursday, caught many novelties. Bought 2 varieties of abominable alligator pears [avocados], and collected 7 kinds of bromeliads.

November 26 Sunday. Panama City. Placed yesterday's captures in papers, wrote my diary [now lost, or this journal].

November 27 Monday. Panama City. Found many butterflies, Sam couldn't catch 3 foot iguana but caught a little one and took it home. Fireworks in the square at night.

November 28 Tuesday. Panama Independence Day, we exploded fireworks and watched fireworks in evening in the square.

November 29 Wednesday. Panama City. Caught some pretty Hesperians [Hesperiidae] before breakfast.

November 30 Thursday. Panama City. Caught butterflies as usual.

December 1 Friday. Panama City. Got \$100 c. y. from the bank. Before breakfast walked out on a hill near the town catching butterflies.

December 2 Saturday. Panama City. Went butterflying early in morning way out on our usual after-breakfast path.

December 3 Sunday. Panama City. Bought 2 parrots at the RR station and at 10 a.m. took RR 46 miles to Aspinwall [now Colon, on N coast of Panama] and got a few bromeliads on the way, where we went aboard a steamer that left during the night for Jamaica. [Letter 221 says Sam and Mead collected maybe 1000 butterflies of 150 species in Panama, and also brought an iguana and a horned toad from Salt Lake & some caterpillars.]

December 4-6 Monday- Wednesday. Steamer. Seasick Dec. 4. Reached Kingston Jamaica Dec. 6 at 3 p.m. and Sam and I went out butterfly hunting.

December 7 Thursday. Hunted butterflies in morning, left Kingston [for New York] 3 p.m.

December 8-31 Friday-Sunday. Arrived in New York Dec. 14 ~9 a.m. and finally docked. At home met Mamma and papa, set a few of Sam's butterflies to soak [relax for mounting]. Spread butterflies Dec. 15-16 & 19-20, Dec. 20 arranged my drawer of *Theclas*, Dec. 22 arranged butterflies, Dec. 25 softened Panama butterflies, Dec. 26-27 & 29 & 31 spread butterflies, Dec. 27 gave some butterflies to a nice boy, went to Central Park Museum [now AMNH] Dec. 16 & 22 & 30, where Dec. 30 at Park museum and in library identified some of my Panama insects.

TRIP TOTALS: Letter 213 says he collected ~2000 Coleoptera and ~3000 butterflies of ~90 species. But Mead (1877) says he collected 3925 butterflies in Colorado, and letter 221 says he caught another 1000 in Pamama, so maybe he caught ~5000 total. He traveled 12075 miles in 1871, total expenses for 1871 trip Jan-May 15 \$252, May 16-later \$2509. that Mead evidently only had to pay half of, so Mead's total was ~\$1506.50 but Mead later lists only \$1590.32. W. H. Edwards paid him only \$50 for butterflies (Calhoun 2015a).

### Identity of Mead's Field Names for Butterflies he Collected

Mead had no book to identify his collected specimens, so he made up names for them as he collected, and used those names on some specimen triangles and in his journal and letters. These identifications of his made-up names come from the labels on some specimens, his letters (Brown & Brown 1996), his journal (Calhoun 2013), Brown study of Edwards' types (1964-1987), Calhoun (2015a, b), and a few from Calhoun (pers. comm.).

Letter 193 says Mead caught 6 species of *Colias*, 6 *Satyrus*, 3 *Chionobas*, 13 *Argynnis*, and 12 *Lycaena*, so some of Mead's made-up names are missing from the following list, but might turn up on labels in some collection someday.

*Papilio* 2=*Papilio multicaudata*

"*pilumnus*"=female *Papilio multicaudata* (he notes one on *Delphinium*, the favorite flower of P. *multicaudata*)(letter 129).

*Parnassius* 1=*Parnassius phoebus smintheus*=*sayi* (letter 129)

*Anthocaris* 1=*Euchloe ausonides coloradensis* (Calhoun 2015a p. 23)

*Anthocaris* 2=*Anthocharis julia* (letter 148)

*Pieris* 1=*Pontia protodice* male (letter 148)

*Pieris* 2=*Pontia protodice* female from plains (letter 148) but *Pontia callidice occidentalis* at

Fairplay (letter 148, and evidently Kenosha House also?)

*Colias* 1=*Colias alexandra*.



*Colias* “interior”=*Colias scudderii* (letter 148)  
*Colias* 3=*Colias alexandra* (Calhoun 2015b found MCZ specimens of *Colias* 3 are *alexandra*, and letter 151 is consistent with *alexandra* because *Colias* 4 is called *scudderii*; letter 163 probably wrongly says it is *scudderii*)  
*Colias* 4=*Colias scudderii* yellow female according to descriptions (letter 151; later in letter 151 Brown wrongly said it was *philodice*, but the descriptions match *scudderii*; there may be some confusion with *alexandra*).  
*Colias* 5=*Colias meadii* (letter 158)  
*Colias* 6=*Colias eurytheme* and form *ariadne* (letter 220)  
*Satyrus* 2=*Erebia epipsodea=rhodia* (letter 151)  
*Erebia* 2=*Erebia epipsodea=rhodia* (letter 152)  
*Satyrus* 3/*Satyrus* (Angelwing) 3=*Erebia callias* (letters 157, 158)  
*Satyrus* 4=*Cercyonis oetus charon* (letters 151, 185)  
*Satyrus* 5=*Cercyonis meadii* (letter 189, 194; in letter 220 Brown mistakenly says *C. oetus*)  
*Chionobas* 3=*Oeneis calais altacordillera* at least at Mosquito Pass (letter 151)  
*Chionobas* 4=*Oeneis melissa lucilla* (letters 151, 180)  
*Limenitis* 1=*Limenitis weidemeyerii weidemeyerii* (letter 129)  
*Grapta* 3=*Polygonia faunus hylas* (letter 220)  
*Vanessa* 1=*Aglais milberti* (letters 122, 148)  
handsome *Vanessa*=*Nymphalis californica* (letter 148)  
*Melitaea* 1=*Euphydryas anicia eurytion* (Calhoun 2015a fig. 18)  
*Melitaea* 6=*Euphydryas anicia eurytion* white larva  
*Phyciodes* 1 (not 4)=*Phyciodes pulchella camillus* female “*emissa*” (letter 122; Brown 1964-1987 92:451)  
*Phyciodes* 4 (not 1)=*Phyciodes pulchella camillus* male (letter 122; Brown 1964-1987 92:451)  
*tharos*=*Phyciodes cocyta selenis*  
*Phyciodes* 2=probably *Chlosyne gorgone* (letters 122, 148)  
*harrisii*=*Chlosyne nycteis drusus* (letter 148)  
*Columbina*=*Euptoieta claudia* (letters 142, 151, 163, 185)  
*Argynnis* 1=*Argynnis edwardsii* male (letter 122)  
*Argynnis* 2=*Argynnis edwardsii* female (letter 122)  
*Argynnis* 3=*Argynnis callippe meadii* (letters 129, 180)  
*Halcyone/Halcyon* [spelled *Halcyon* only on letters 157, 158, 177, 189, 194, 207)]=*Argynnis hesperis hesperis* unsilvered (evidently rarely or never *A. aphrodite whitehousei=ethne*, evidently rarely or never *Argynnis coronis halcyone*) (letters 148, 157, 158, 177, 189, 194, 207, Journal entries June 24-25-26-27, July 28-29, Sept. 3, 7) (see the *Argynnis hesperis* writeup)  
*Argynnis* 4=*Boloria freija browni* (letter 148)  
*Nenoquis*=*Boloria bellona bellona* (He marked the triangle of the single specimen *Argynnis* 5 but in letter 177 wrote it is NOT that)  
*Argynnis* 5=*Boloria frigga sagata* (letters 148, 177)  
*Hesperis*=*Argynnis hesperis hesperis* partly silvered (letters 157, 177, 189, 207, Journal entries July 28-29) (see the *Argynnis hesperis* writeup)  
*Hesperia* (fritillary)=Partly-silvered *Argynnis hesperis hesperis* (letter 189)  
*Argynnis* 6=Partly-silvered *Argynnis hesperis hesperis* (letters 148, 157, see the *Argynnis hesperis* writeup)  
*Argynnis* 7=*Boloria eunomia caelestis* (letters 148, 151, it is not *eurynome*)  
*Argynnis* 8=*Boloria titania helena* (letter 148, 151)

*Astarte* 9=*Argynnis mormonia eurynome* (*Astarte* explained by Edwards Trans. Amer. Ent. Soc. 4:66, 1872)  
*Argynnis* 9=*Argynnis mormonia eurynome* (letters 157, 191, 199, Brown wrongly stated unknown at earlier letter 152)  
*Argynnis* 10=*Argynnis mormonia eurynome* unsilvered (letter 157)  
*Argynnis* 11=*Boloria selene tollandensis* (letter 177)  
*Argynnis* 13=? (letter 193)  
*Lycaena* 1=*Plebejus melissa* male (some early ones in Denver & maybe some at Turkey Creek were *Plebejus lupini texanus* evidently) (letter 122, Brown 1964-1987 96:373-375; Mead {1876} did not define *Lycaena* 1 & 2 contrary to what Brown wrote at end of letter 151)  
*Lycaena* 2=*Plebejus melissa* female without blue on ups bases (letter 122; Brown 1964-1987, 96:373)  
*Lycaena* 2 var. 2=*Plebejus melissa* female without ups blue (Brown 1964-1987 96:373)  
*Lycaena* 4=*Plebejus icarioides lycea* (letter 148)  
*Lycaena* 5=*Plebejus melissa* variety (letters 148, 151)  
*Lycaena* 8=*Plebejus saepiolus saepiolus* X *gertschi* = *whitmeri* (letter 148)  
*Lycaena* 9=*Plebejus lupini lutzi* (letter 148)  
*Lycaena* 11=*Lycaena heteronea gravenotata* (ssp. *heteronea* at Twin Lakes?) (letter 151)  
*Lycaena* 13=probably *Plebejus shasta pitkinensis* (letter 177)  
*Chrysophanus* 1=*Lycaena helloides* (letter 122)  
*Chrysophanus* 2=*Lycaena rubidus sirius* (letter 151)  
“*Thecla*” larvae=*Lycaena rubidus sirius* (ID by Scott based on knowledge of butterflies and localities, as true *L. helloides* is at low altitude and the mts. bugs are now known to be *L. florus* which generally eats *Vaccinium*); larvae noted in Journal June 16 & 22, Mead 1876, letters 142, 151)  
*Thecla* 7=*Lycaena arota virginiensis* = *schellbachi* (letter 220, it is not *Satyrrium behrii* as Brown wrote in letter 189)  
*Hesperia* 1=*Polites draco* according to Brown (1964-1987 106:48), who said 3 pairs were labeled with *Hesperia* 1 and various dates (one would think that *Hesperia* 1 would refer to some earlier *Hesperiidae* species from perhaps Turkey Creek, but Brown presumably read them properly as *Hesperia* 1).  
*Hesperian* 7=*Polites draco* (letter 151, the gulch with footnote #21 only, not footnote #15)  
*Hesperian*=*Pyrgus centaureae* (letter 151, the 16 specimens in footnote #15 only, not footnote #21)  
*Hesperia* 8=*Hesperia nevada nevada* (lectotype label in MCZ)  
*Hesperia* 11=*Hesperia juba* (Utah, letter 220)  
*Hesperia* A=*Ochlodes sylvanoides napa* (Brown 1964-1987 106:71--letter 180 says A8.19 may differ from A8.20)  
B (*Hesperians* {*Skippers*} )=? (letter 180 written Aug. 22) (maybe *Hesperia comma*?)  
C (*Hesperians* {*Skippers*} )=? (letter 180 written Aug. 22) (maybe *Hesperia comma*?)  
*Hesperia*, sp. (?) = *Pyrgus centaureae* (Mead {1876})

## Discussion and Conclusions

This project is definitely a voyage into the Old Name Sewer, because identifications were poor, most locality information was discarded by W. H. Edwards who carelessly threw away Mead's month and date information on specimens that he kept, and Mead often did not put localities on his own specimens, and then Brown chose lectotypes using worthless specimens in the Edwards

collection that lack locality/date information rather than specimens with month and day data from the Mead collection, etc. The data is a fragmentary mess. But by drawing together all the information regarding Mead's collections—Mead's paper, journal, and letters, Brown's and Calhoun's studies and analysis, museum specimens etc., and using good topographic and trail maps and my 56 years experience with Colorado butterflies, I have been able to make a decent tabulation of Mead's butterflies and their localities, plus a collection diary of Mead's butterflies, while making numerous improvements and fixing many mistakes. The information herein will make it easy for people who study museum specimens to add perhaps 100-200 museum specimens to the data (unfortunately most museum specimens including Mead-collection specimens lack month/day location data so are useless), which will provide some new localities for Mead's captured specimens.

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