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Descriptions of and Notes on North American Geometridae (Lepidoptera), No. 3

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Several species have come to hand from Mr. Lloyd M. Martin of the Los Angeles County Museum and from Mr. Charles P. Kimball that apparently are without names. A few of these have also been standing unidentified in the collection of the American Museum of Natural History for several years. In order that names may become available for these species, the following descriptions are given. Also included in this paper are a few notes on *Semiothisa*, *Ultracis*, and *Glena*.

The author wishes to express his thanks to Mr. D. S. Fletcher of the British Museum (Natural History) and to Dr. E. L. Todd of the United States National Museum, who were kind enough to make comparisons with type material in their charge in order to make certain of the identification of certain species in this paper. Thanks also go to Miss Marjorie Statham for the genitalic drawings, and to Mr. Rudolph J. Schrammel for the photographic work, included in this paper.

STERRHINAE

Sterrha insulensis, new species

Figures 2, 9, 10, 11

MALE: Head, vertex light gray or grayish white; front black or brown-black; palpi small, brown-black; antennae fasciculate. Thorax

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light gray or grayish white above, pale grayish brown below; legs pale grayish brown, fore femur darker brown, mesothoracic femur and tibia fringed, metathoracic leg reduced, tibia fringed, without spurs, with strong hair pencil extending to end of segment, tarsus less than one-half as long as tibia. Abdomen light gray or grayish white above and below, somewhat suffused with pale brown scales.

UPPER SURFACE OF WINGS: Forewings, R_1 free, no areole, R_5 from stalk well before R_2 ; secondaries, Sc and R touching near base, R and M_1 strongly stalked, anal margin folded under, enclosing specialized scaling, with slight indentation on outer margin between veins Cu_2 and A in some specimens. Ground color of all wings light gray, with some variable amount of pale gray-brown suffusion and a few scattered black scales; forewings unicolorous, with narrow, black t. a. and t. p. lines crossing wing, the former arising one-third of distance from base, extending across wing with slight outward bulge in center of wing; median area concolorous with remainder of wing or sometimes with scattered black scaling, small discal spot sometimes indicated; t. p. line arising two-thirds of distance from base, subparalleling outer margin to vein Cu_2 , with inward bend in cell Cu_2 , outward again almost to reach outer angle; terminal line absent, rarely with series of black cellular spots; fringe concolorous with wing. Hind wings concolorous with forewings, tending to be more suffused with pale grayish brown except for anal area; maculation absent except for black patch on anal margin, sometimes very faintly continued into wing as incomplete cross line; dark marginal line sometimes present in lower part of wing, fading out above; fringe concolorous with wing.

UNDER SURFACE OF WINGS: All wings unicolorous pale brownish gray, without maculation, rarely with dark discal dots and traces of cross lines; fringes concolorous with wings.

Length of forewing: 5 to 6 mm.; holotype, 6 mm.

FEMALE: Similar to male as far as can be determined from the limited material; forewings perhaps tending to be more suffused with black in median area.

Length of forewing: 5 to 6 mm.; allotype, 6 mm.

MALE GENITALIA: Uncus slender, tapering; gnathos with median area scoop-shaped; valves not extending beyond apex of uncus, apex bluntly rounded, thick, inner surface sparsely haired; saccus reaching base of valves medially, laterally produced anteriad for more than twice the length of uncus, with elongate hair pencil at apex, the hairs extending almost to apex of valves, lateral portion of extensions connecting posteriorly with outer surface of valves; anellus broad, taper-

ing posteriorly, with slight median indentation, apex more or less truncate; aedeagus elongate, longer than combined lengths of uncus, tegumen, and saccus (to base of valves); vesica armed with a single, sclerotized cornutus one-half of the length of the aedeagus, and an elongate, finely scobinate patch having a small sclerotized piece basally.

FEMALE GENITALIA: Sterigma membranous; ductus bursae short, thin, sclerotized, longitudinally striate; ductus seminalis arising from posterior portion of corpus bursae as broad tube; corpus bursae globular, with two strips of scobinations extending from ductus bursae and

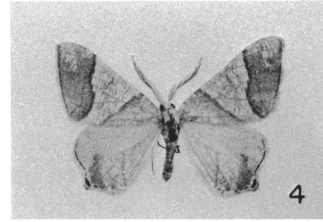
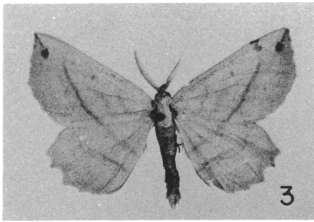
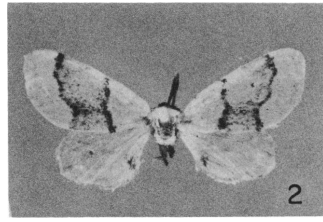
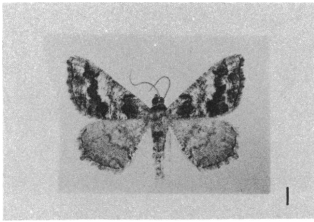


FIG. 1. *Semiothisa sanfordi*, new species, paratype male.

FIG. 2. *Sterrha insulensis*, new species, paratype male. $\times 3$.

FIG. 3. *Euchlaena silacea*, new species, paratype male.

FIG. 4. *Pityeja ornata*, new species, paratype male.

All figures $\times 1$ unless otherwise stated.

meeting anteriorly, and with large, semicircular, sclerotized area on opposite side, the surface finely scobinate and with central portion raised.

TYPES: Holotype, male, Tavernier, Monroe County, Florida, October 1, 1955 (J. N. Todd); allotype, female, same data, August 14, 1955. Paratypes, 40 males and one female, same data as types, various dates between July 20 and October 24, 1955. Holotype and allotype in the collection of the American Museum of Natural History; paratypes

in the collection of that institution, of the United States National Museum, and of C. P. Kimball.

This is a small, broad-winged, and rather insignificant-looking species, which is apparently without any close relatives in this country. The nearest known allied species is the moth determined by Schaus as *Lobocleta perditaria* (Walker) (1940, Scientific survey of Porto Rico and the Virgin Islands, New York Academy of Sciences, vol. 12, p. 302) from Puerto Rico. In both species R_1 is free, and there is no areole in the forewing, so a reference to *Lobocleta* is inadvisable, as that genus should have a double areole. Both these species are similar in appearance, but the male genitalia are quite different. In *insulensis* the aedeagus is longer and the vesica has an elongate cornutus, and the saccus is much more elongate laterally than in the Puerto Rican species.

The type series of *insulensis* was taken in a light trap, and some of the specimens are not in the best of condition. Only two females are present, one without an abdomen and without a complete set of legs between them; this accounts for the rather incomplete description of this sex.

ENNOMINAE

Semiothisa distribuaria (Hübner)

Eutropa distribuaria HÜBNER, "1825" [1827-1831], *Zuträge zur Sammlung exotischer Schmettlinge*, vol. 3, p. 39, figs. 585, 586.

Macaria oppositaria GUENÉE, 1857, *Histoire naturelle des insectes*, vol. 10, p. 76; 1858, *op. cit.*, atlas, phalénites, pl. 4, fig. 6.

Macaria transitaria WALKER, 1861, List of the specimens of lepidopterous insects in the collection of the British Museum, pt. 23, p. 886 (new synonymy).

Cymatophora distribuaria transitaria, DYAR, "1902" [1903], *Bull. U. S. Natl. Mus.*, no. 52, p. 315.

Macaria distribuaria transitaria, BARNES AND McDUNNOUGH, 1917, Check list of the Lepidoptera of Boreal America, p. 112.

Semiothisa distribuaria transitaria, McDUNNOUGH, 1938, Check list, pt. 1, p. 158.

Macaria proxanthata WALKER, 1862, List of the specimens of lepidopterous insects in the collection of the British Museum, pt. 26, p. 1642.

Aspilates ? antaurata WALKER, 1862, List of the specimens of lepidopterous insects in the collection of the British Museum, pt. 26, p. 1686.

An examination of the three Walker types in the collection of the British Museum (Natural History) by D. S. Fletcher indicates that they all represent the same species. Guenée's type of *oppositaria* is not in the United States National Museum collection, and it may be lost.

However, two specimens from the Guenée collection are in the British Museum, one being labeled as *oppositaria* in Guenée's handwriting. These two specimens, as well as the illustration given by Guenée, would indicate that this species is correctly placed in the synonymy of *distribuaria*.

This species is represented in the American Museum collection from Florida, Mississippi, Georgia, and North Carolina, and it has been captured in every month of the year. It is a large species, with the length of the forewing ranging from 14 to 18 mm. in both sexes. The average wing length is 15.3 mm. for a series of 16 males, and 15.5 mm. for 23 females. The basal and central parts of the upper surface of the forewings are a light gray, more or less heavily overlain with dark gray and gray-brown scaling, and the area beyond the t. p. line is dull reddish brown. The t. a. line is curved outward in the middle of the wing, often with small convex bends in the cell and below vein Cu; the t. p. line is roughly S-shaped, but these two fascia do not tend to approach each other above the lower margin.

***Semiothisa sanfordi*, new species**

Figure 1

MALE: Head, vertex and front orange-brown; palpi pale buff, with some orange-brown scales. Thorax grayish white above and below, with a few brown-black scales; collar orange-brown; legs grayish white, with numerous brown and dark brown scales, forelegs with trochanter orange-brown, hind legs with strong tibial hair pencil. Abdomen light brown or gray-brown above, with brown-black scaling, and with terminal margins of segments grayish white, under side with more grayish white scaling.

UPPER SURFACE OF WINGS: Forewings, ground color white, showing mainly in median area of wing; basal area broadly suffused with gray, and with base of cell and cubital cell dark reddish brown; t. a. line black, arising on costa one-fourth of distance from base, with small outward bend in cell and with a larger one in cubital cell, then inwardly concave to inner margin; median area of ground color, the costa shaded with gray and brown, and with diffuse median shade line; t. p. line black, arising on costa two-thirds of distance from base, with outward points on veins M_1 , M_3 , Cu_2 , and A, concave between, with strongest basal bend in cell Cu_2 , course of t. p. line slightly S-shaped; subterminal area broadly suffused with reddish brown or burnt sienna; s. t. line of ground color, rather diffuse and sometimes partially obscured; terminal area suffused with gray and gray-brown

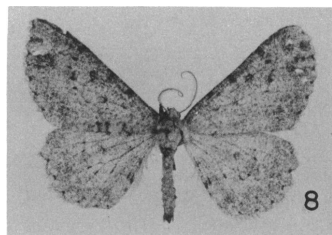
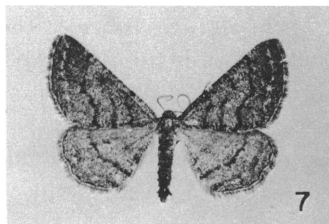
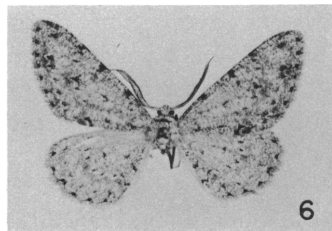
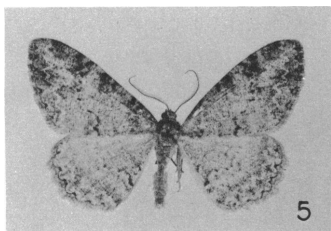


FIG. 5. *Merisma ceraea*, new species, paratype male.

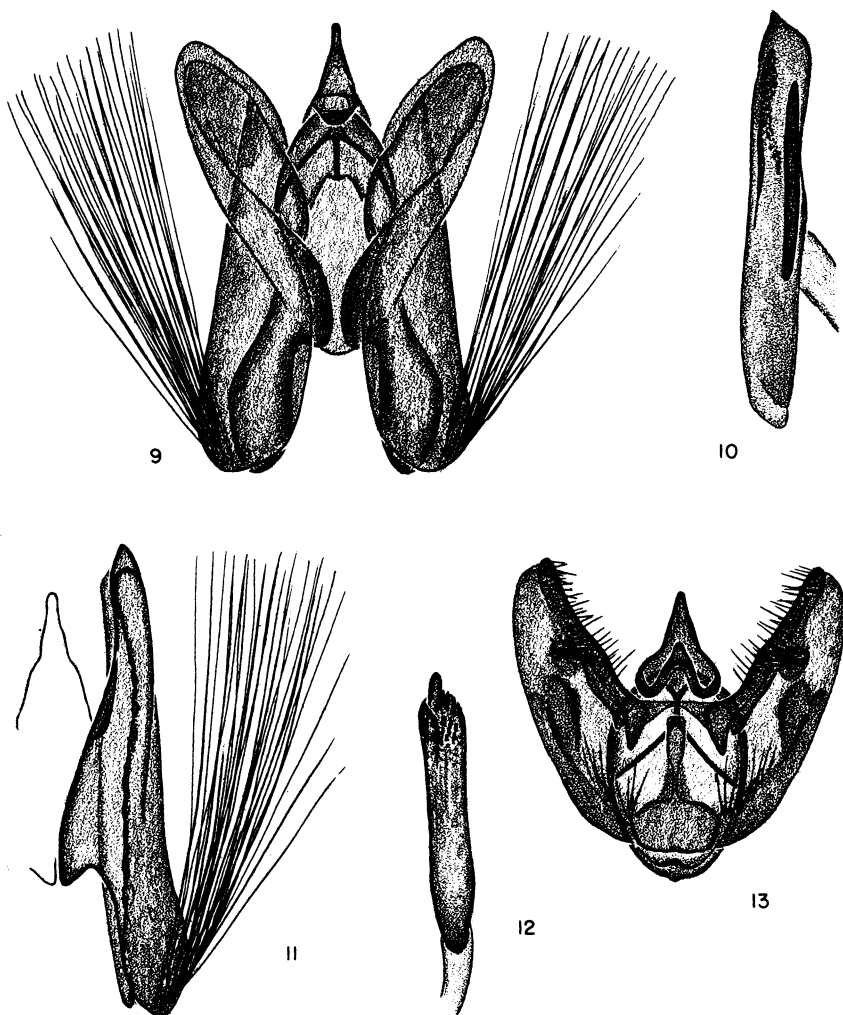
FIG. 6. *Glena arcana*, new species, paratype male.

FIG. 7. *Ultralcis fumida* (W. Warren), male, Big Thompson Canyon, Larimer County, Colorado, July 9, 1955 (R. H. Leuschner).

FIG. 8. *Mericisca scobina*, new species, paratype male.

scales, with veins reddish brown; terminal line black, interrupted by veins, weak in lower part of wing, emphasized as intravenular dots; fringe grayish white, broadly dark gray opposite veins. Hind wings light gray basally, with numerous gray and gray-brown scales and striations; intradiscal line dark brown, diffuse, extending from radial vein to anal margin; discal dot small, black-brown; extradiscal line dark brown, complete, concave between veins, becoming black near anal margin; outer portion of wing brownish gray, darkening distally, with indistinct, dark brown, subterminal line; terminal line and fringe as on primaries.

UNDER SURFACE OF WINGS: Ground color white, with much gray and reddish brown scaling and striations, most veins pale brown; forewings with costa yellow-brown; cross lines of upper surface reflected through; t. a. line weak, median shade and t. p. line rather prominent; discal dot black-brown, in median shade; outer portion of wing broadly suffused with brown, with diffused and incomplete s. t. line; terminal line and fringes as above. Hind wings similar to forewings, with discal spot, complete intradiscal line, broad brown subterminal



FIGS. 9-13. Male genitalia. 9. *Sterrha insulensis*, new species, holotype. 10. Aedeagus of same. 11. Paratype, with valves not opened. 12. Aedeagus of *Merisma ceraea*, new species, holotype. 13. Genitalia of same.

area bounded by extradiscal and s. t. lines; terminal area concolorous with basal two-thirds of wing; terminal line and fringe as on forewings.

Length of forewing: 11 to 13 mm.; holotype, 11 mm. A series of 60 specimens averages 11.8 mm. in wing length.

FEMALE: Similar to male.

Length of forewing: 11 to 13 mm.; allotype, 12 mm. A series of 54 specimens averages 12.2 mm. in wing length.

MALE GENITALIA: Similar to those of *distribuaria*.

FEMALE GENITALIA: Similar to those of *distribuaria*, but with ductus bursae tending to be shorter, smaller, and with fewer longitudinal striations, and with stellate signum smaller, having fewer but larger rays around the edge, and tending to be more uniseriate than those of *distribuaria*.

TYPES: Holotype, male, Port Sewall, Martin County, Florida, March 16–21, 1949 (L. J. Sanford); allotype, female, same data, January 22, 1938 (L. C. Sanford). Paratypes, 53 males and 49 females, same data as types, various dates in November, December, January, February, March, and April, 1938–1950; three males and one female, Weeki Wachee Springs, Hernando County, Florida, March 20, April 2, 1955, August, 1954 (J. F. May); one female, Vero Beach, Indian River County, Florida, April, 1941 (J. R. Malloch); two females, St. Petersburg, Pinellas County, Florida, February 16–23, March 16–23; three males and 14 females, "Florida." Holotype and allotype in the collection of the American Museum of Natural History; paratypes in collections of that institution, of the United States National Museum, of the Los Angeles County Museum, and of C. P. Kimball.

This species is a close relative of *distribuaria* Hübner. It may be distinguished from that species by its much smaller size, by the contrast of the white median area of the forewings with the reddish brown basal and subterminal areas, by the white s. t. line, and by the tendency of the t. a. and t. p. lines to converge in the cubital cell.

This species is named in honor of the collector of the bulk of the type series, Leonard J. Sanford.

Mericisca scobina, new species

Figures 8, 16, 17, 22

MALE: Head, vertex and front gray, sometimes with faint pinkish or brown luster; palpi gray-brown, extending just beyond front. Thorax gray above, with scattered brown scales, sometimes with faint pinkish luster; below light gray; legs gray, with some brown and dark brown scaling. Abdomen gray, with scattered dark brown scales above, with very little dark scaling below.

UPPER SURFACE OF WINGS: Forewings, ground color unicolorous light gray or light grayish brown, with numerous scattered, dark brown scales, sometimes with faint pinkish or olivaceous cast; t. a. line represented on costa one-fourth of distance from base by large dark

brown spot, and on veins Cu and A by smaller dark brown spots; median line indicated on costa by large, dark brown spot basad of center of wing, and by smaller spots on veins Cu and A, the first two sometimes connected by faint line, sometimes with line running from anal vein to anal margin; discal spot circular, dark brown, with center of ground color; t. p. line dark brown, indicated by venular spots, arising on costa approximately three-fifths of distance from base, curving gently outward around cell, then recurving basad to meet inner margin about one-half of distance from base; outer portion of wing heavily suffused with brown scales; s. t. line faintly indicated, white, usually incomplete, crenulate; outer margin of wing crenulate, with faint terminal line and dark intravenular spots; fringe basally of ground color, darker distally, and with dark suffusion opposite intravenular spots of terminal line. Hind wings concolorous with forewings; intradiscal line represented on anal margin, extending part way across wing; discal spot circular or horseshoe-shaped, open below, dark brown; postdiscal line complete, emphasized by venular spots, subparalleling outer margin in upper part of wing, with basal bend near anal margin; s. t. line faint, usually incomplete; terminal line, spots, and fringes as on forewings.

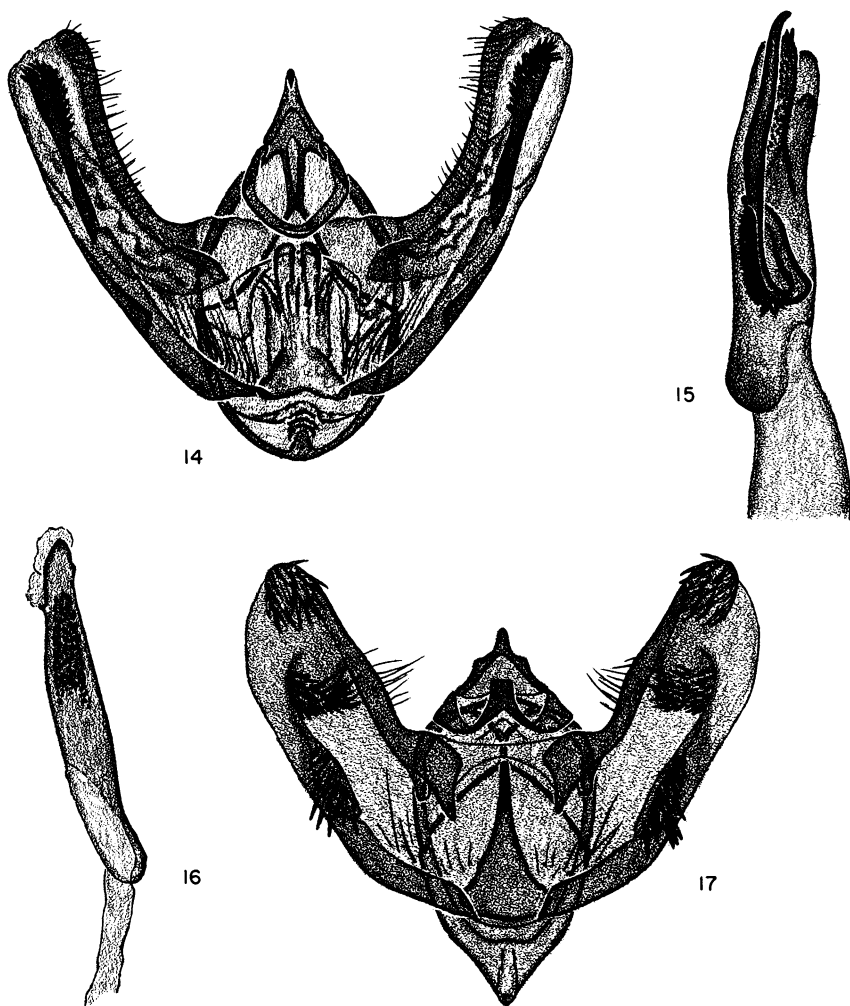
UNDER SURFACE OF WINGS: Ground color of wings light gray to light yellowish brown, with variable amount of scattered, dull grayish black scaling; forewings with costa light yellowish brown; t. a. and median lines absent, but sometimes with faint indication of their costal spots; discal spot large, elliptical; t. p. line faint, course as on upper surface, fading out in lower portion of wing; terminal line and intravenular spots absent; fringe concolorous with wing, slightly darkened distally. Hind wings without maculation except for discal spot.

Length of forewing: 19 to 22 mm.; holotype, 19 mm.

FEMALE: Similar to male; upper surface of wings heavily suffused with dark scales, obscuring the maculation and giving the wings a dark gray-brown or slightly olivaceous appearance.

Length of forewing: 19 to 21 mm.; allotype, 20 mm.

MALE GENITALIA: Uncus with projecting shoulder midway on slightly concave sides, apex bluntly rounded; gnathos well sclerotized, with well-defined median area broad, apically truncate; valves with concave area near base of sclerotized costa, median sclerotized patch subtriangular, sacculus patch elongate, both with numerous, well-developed spines; anellus large, sclerotized, subtriangular, extending posteriorly as far as base of valves; saccus extending well beyond base of valves, bluntly rounded or somewhat pointed; aedeagus subequal



FIGS. 14-17. Male genitalia. 14. *Glena arcana*, new species, holotype. 15. Aedeagus of same. 16. Aedeagus of *Mericisca scobina*, new species, paratype. 17. Genitalia of same.

in length to combined lengths of uncus, tegumen, and saccus, slender, tapering posteriorly; vesica scobinate.

FEMALE GENITALIA: Sterigma with elongate, sclerotized, lateral plates, in length equal to length of papillae anales, divergent posteriorly, with median constriction, distal one-half concave and with rough surface; ductus bursae very short, sclerotized; corpus bursae

very long, slender, membranous except for small, lightly sclerotized, posterior area, in length equal to length of apophyses posteriores; signum small, outer edge raised, roughly circular but with a number of small projections from edge.

Types: Holotype, male, Southwestern Research Station of the American Museum of Natural History, 5 miles west of Portal, Cochise County, Arizona, elevation 5400 feet, July 26, 1957 (M. Statham); allotype, female, upper camp, Pinery Canyon, Chiricahua Mountains, Cochise County, Arizona, July 4, 1956 (L. M. Martin, J. A. Comstock, and W. A. Rees). Paratypes, one male, same data as holotype, August 9, 1956 (E. Ordway); 11 males and one female, same data as allotype, July 5-9, 1956; one male and three females, Pinery Canyon, Chiricahua Mountains, Cochise County, Arizona, July 5-9, 1956 (C. W. Kirkwood); three males, Pine Crest, Mt. Graham, Pinaleno Mountains, Graham County, Arizona, July 28-29, 1955, elevation 7300 feet (L. M. Martin); one male, Greer Road, White Mountains, Arizona, June 26, 1935 (J. A. Comstock); three males, Tesuque Canyon, Santa Fe County, New Mexico, elevation approximately 8500 feet, August 4, 1932 (H. Ruckes); one male, Estes Park, Larimer County, Colorado (R. Wiest; represented by wings glued on a piece of cardboard, with genitalia mounted on slide J. L. S. 403). Holotype in the collection of the American Museum of Natural History; allotype in the Los Angeles County Museum collection; paratypes in the collections of both these institutions.

This species is similar to *perpictaria* Barnes and McDunnough but it is considerably larger and lacks the general olivaceous color of that species. The male genitalia of these two species are similar, but the present species has a shorter, chunkier uncus, broader spinose patches on the valves, a longer anellus, and a scobinate vesica. No females of *perpictaria* are before the author, so no comparisons can be made of this sex.

***Merisma ceraea*, new species**

Figures 5, 12, 13, 23

MALE: Head, vertex and front with a mixture of light gray and gray-black scales, the dorsolateral ridges of front small; palpi with basal segment with elongate, light gray scales, apical segment with short, gray-black scales, reaching to middle of eye; antennae with longest pectinations twice as long as basal segments. Thorax with a mixture of light gray and gray-black scales above, metathorax largely light gray or white; below grayish white; legs grayish white, tibiae and

tarsi banded with black or black-brown. Abdomen grayish white above and below, upper surface suffused with brown-black scales.

UPPER SURFACE OF WINGS: Forewings, ground color light gray, with numerous gray-brown and black-brown scales and striations; t. a. line arising about one-fifth of distance from base as broad, geminate patch on costa, dark brown, extending to cubital vein at right angle to costa, turning basad and going to inner margin, the outer section of dark scales becoming diffuse in lower part of wing; median line arising about two-fifths of distance from base as broad, geminate, dark brown patch on costa, with distal part of patch wider than basal part, narrowing and fading out in cell, rarely extending across wing, when present making sharp basal bend in cells to cubital and anal veins, with outward curve in cubital cell, straight to inner margin; discal spot absent; t. p. line the most prominent part of maculation, arising on costa about two-thirds of distance from base as broad, geminate, black-brown patch on costa, with distal part of patch wider and browner than basal part, with gentle outward curve in upper part of wing, swinging basad below, outer portion of line disappearing in upper one-half of wing, the line represented by venular spots more or less connected by blackish line, concave in cells, strongest in cells Cu_2 and A; subterminal area with dark grayish suffusion below costa, followed by white patch in cells M_1 and M_2 , with another dark suffusion in cell M_3 ; s. t. line white, complete, crenulate; outer margin of wing crenulate, with narrow, black, terminal line and intravenular spots; fringe checkered, grayish white opposite vein endings, darker between. Hind wings concolorous with forewings; intradiscal line extending from lower part of wing to anal margin; discal spot faint or absent; postdiscal line complete, emphasized as venular spots, concave between veins, shaded distally by narrow band of ground color; s. t. line usually complete, as on forewings, sometimes partially obsolescent; terminal line and spots as on primaries; fringe light grayish brown with faint, median, dark line.

UNDER SURFACE OF WINGS: Ground color of wings light gray, with variable amount of scattered, dull grayish black scaling; forewings suffused with light yellowish brown along costa, at apex of wing and on veins; maculation absent, although part of upper side pattern in some specimens is faintly indicated; intravenular terminal spots present, small, faint; fringe of ground color. Hind wings without maculation except for faint terminal line and weak intravenular spots.

Length of forewing: 11 to 19 mm.; holotype, 19 mm.

FEMALE: Similar to male; upper surface of wings slightly more

heavily suffused with dark scales; under surface of forewings more heavily clouded with dark scaling also.

Length of forewing: allotype, 19 mm.

MALE GENITALIA: Uncus elongate, tapering from broad base; gnathos well sclerotized, with median area bluntly pointed; valves tapering, costa sclerotized, with small, well-defined, sclerotized, spine-bearing area in middle, extending from costa; sacculus lightly sclerotized, the sclerotized area extending to spine-bearing area; anellus with posterior portion triangular, the apex pinched in and extending posteriorly as thin strip, becoming laminate between bases of valves; aedeagus slightly longer than combined lengths of uncus, tegumen, and saccus, slender; vesica finely scobinate medially, the scobinations becoming larger posteriorly, and with a protruding, sclerotized, finger-like projection at posterior margin.

FEMALE GENITALIA: Sterigma with sclerotized plate, broadly diamond-shaped; ductus bursae sclerotized, posterior margin flared, widening anteriorly, asymmetrical, the left side more curved than right; corpus bursae membranous, leaving ductus bursae on angle, curving and enlarging in form of large sack; signum large, elliptical, the edge with numerous, shortly stellate projections.

TYPES: Holotype, male, Pine Crest, Mt. Graham, Pinaleno Mountains, Graham County, Arizona, elevation 7300 feet, June 29, 1955 (W. Rees); allotype, female, same data, June 28, 1955 (L. M. Martin). Paratypes, two males, same data as types; one male, Ramsay Canyon, Huachuca Mountains, Cochise County, Arizona, July 16, 1948 (C. and P. Vaurie); one male, Palmerlee, Cochise County, Arizona; one male, no data except July 1-7. Holotype and allotype in the collection of the Los Angeles County Museum; paratypes in the collection of that institution and in the American Museum of Natural History.

This species forms a parallel situation with *Meriscsa perpictaria* (Barnes and McDunnough) and *scobina* Rindge with the type species *gracea* Hulst, as they look unlike their respective genotypes. In fact, the facies of the present species would appear to place it as a *Meriscsa* rather than a *Merisma*, but a check of the generic characters proves otherwise. This species can be separated from *spododea* Hulst by the different maculation, the larger size, and by the longer pectinations in the male antennae, as they are twice as long in the present species. As compared with *spododea*, *ceraea* has larger, more elongate male genitalia, a shorter, chunkier uncus, a shorter median area of the gnathos, the small, finger-like, spine-bearing area in the valve, and it lacks the short, curved spine in the vesica that is present in *spododea*.

As far as can be determined from the single female genitalic dissection of *ceraea*, it can be separated from *spododea* by the asymmetrical ductus bursae and by the fact that the signum is not so strongly stellate as in that species.

There is some difference between the specimens of this species from the Graham Mountains, the type locality, and from those taken in the Huachuca Mountains. The former are of much more recent date of capture and, as a result, they have had less opportunity to become faded. Whether or not this is the reason for the difference, they are of a grayer color than are those from the Huachucas, as the latter tend to be more brownish.

Ultralcis fumida (W. Warren), new combination

Figure 7

Exelis ? *fumida* W. WARREN, 1904, Novitates Zool., vol. 11, p. 581.

Cleora fumida, BARNES AND McDUNNOUGH, 1917, Check list of the Lepidoptera of Boreal America, p. 118.

Merisca fumida, McDUNNOUGH, 1938, Check list, pt. 1, p. 163.

Mr. D. S. Fletcher of the British Museum (Natural History) has kindly furnished the author with a drawing of the maculation and of the genitalia of the male type of *fumida*. These correspond very nicely with a short series of moths from Colorado in the American Museum and Los Angeles County Museum collections, and in the collection of R. H. Leuschner. This species is slightly smaller than *latipennis* Hulst, as the length of the forewing is from 16 to 18 mm., as opposed to 17 to 19 mm. for *latipennis*. The pectinations of the male antennae are much shorter in *fumida*, as they are approximately twice the length of the antennal segments, while in *latipennis* they are four or five times as long. The upper surface of the wings is browner in *fumida*, and the t. a. and t. p. lines tend to be completely represented on the primaries. The male genitalia of both species are similar, but *fumida* has a smaller and less sclerotized posterior portion of the anellus, and the aedeagus has a smaller cornutus. The female genitalia of *fumida* have a smaller sterigma, and the short ductus bursae and posterior portion of the corpus bursae are slightly narrower and less heavily sclerotized than in *latipennis*.

GENUS *GLENA* HULST

Glena HULST, 1896, Trans. Amer. Ent. Soc., vol. 23, p. 358. McDUNNOUGH, 1920, Canadian Dept. Agr., Tech. Bull., no. 18, p. 24. FORBES, 1948, Cornell Univ. Agr. Exp. Sta. Mem., no. 274, p. 54.

The generic descriptions given by the above authors call for the

male hind tibia to be without a hair pencil and for A_3 to be without a bristle tuft. McDunnough noted, however, that *pexata* Swett (= *grisearia* Grote) was atypical in this regard in that it had the tibial hair pencil. Since McDunnough's paper, two additional species have been described that fall into this group, namely, *alpinata* Cassino and *minor* Sperry. As this entire group possesses the tibial hair pencil and the bristle tuft on A_3 of the males, it is advisable to enlarge the generic diagnosis to include these characters as being present in this section of the genus.

A dissection of the type of *furfuraria* Hulst from the Hulst collection shows that this species was misidentified in the McDunnough paper. According to the original description, *furfuraria* was described from three males. To avoid any possible confusion, the specimen from the Hulst collection, now in the American Museum of Natural History, is hereby designated as the lectotype. A study of this type proves that this species is one with the tibial hair pencil and bristle comb. By both maculation and genitalia, *furfuraria* is extremely close to *alpinata* Cassino, and it is possible that these names represent opposite ends of the distribution of a single species in the southern Rocky Mountains. Colorado is the type locality for the former, and Alpine, Texas, is the type locality for the Cassino name. More material is needed before this problem can be satisfactorily settled.

As *furfuraria* Hulst was misidentified in the McDunnough paper, it becomes necessary to rename this species.

***Glena arcana*, new species**

Figures 6, 14, 15, 26

Glena furfuraria auct. nec Hulst. McDUNNOUGH, 1920, Canadian Dept. Agr. Tech. Bull., no. 18, p. 24, pl. 3, fig. 10 (male genitalia), pl. 7, fig. 13 (adult). CASSINO, 1927, Lepidopterist, vol. 4, p. 74.

MALE: Head, vertex white with scattered gray-brown scales; front with dorsal and ventral margins like vertex, median area broadly black-brown; palpi black-brown, basal segment with some gray-brown scaling below, terminal segment with some white scales. Thorax white above, with scattered gray-black scales, the collar black posteriorly; below grayish white; legs grayish white, with brown scaling on fore-legs and with some grayish brown on other legs, hind tibia without hair pencil. Abdomen white, upper surface with scattered pale brown or grayish brown scales, these sometimes concentrated on both sides of midline on posterior portions of segments to form spots, especially on A_3 and A_4 .

UPPER SURFACE OF WINGS: Forewings, ground color white, more or less heavily overlain with gray and grayish brown scales and striations, producing the appearance of pale gray; t. a. line represented on costa one-fourth of distance from base by black-brown spot, and by small spots on veins Cu and A; median line represented near middle of costa by another black-brown spot, followed by faint gray line curving outward in cell, swinging basally to dark patch at branching of veins Cu and Cu₂, the line disappearing, represented again on anal vein as spot; discal dot absent; t. p. line arising on costa two-thirds of distance from base as black-brown spot, the line represented by dark venular spots across wing, with occasional faint gray scaling between, subparalleling outer margin; subterminal area concolorous with basal part of wing, with diffuse gray patch in lower margin near t. p. line; s. t. line white, crenulate, sometimes partially obsolescent, the basal parts of crenulations filled with gray or black-brown scales; terminal area slightly darker than subterminal area; terminal line absent or very weak, but with strong, black, intravenular spots; fringe lightly checkered in basal one-half, lighter distally opposite veins. Hind wings concolorous with forewings; intradiscal line extending from lower part of wing to anal margin, strongest on veins; discal spot black-brown; postdiscal line represented by a series of dark venular spots, sometimes connected, followed by narrow band of ground color and then by a broader, gray-brown band; s. t. line a series of venular dots, sometimes weak or absent; terminal line, intravenular spots and fringe as on forewings.

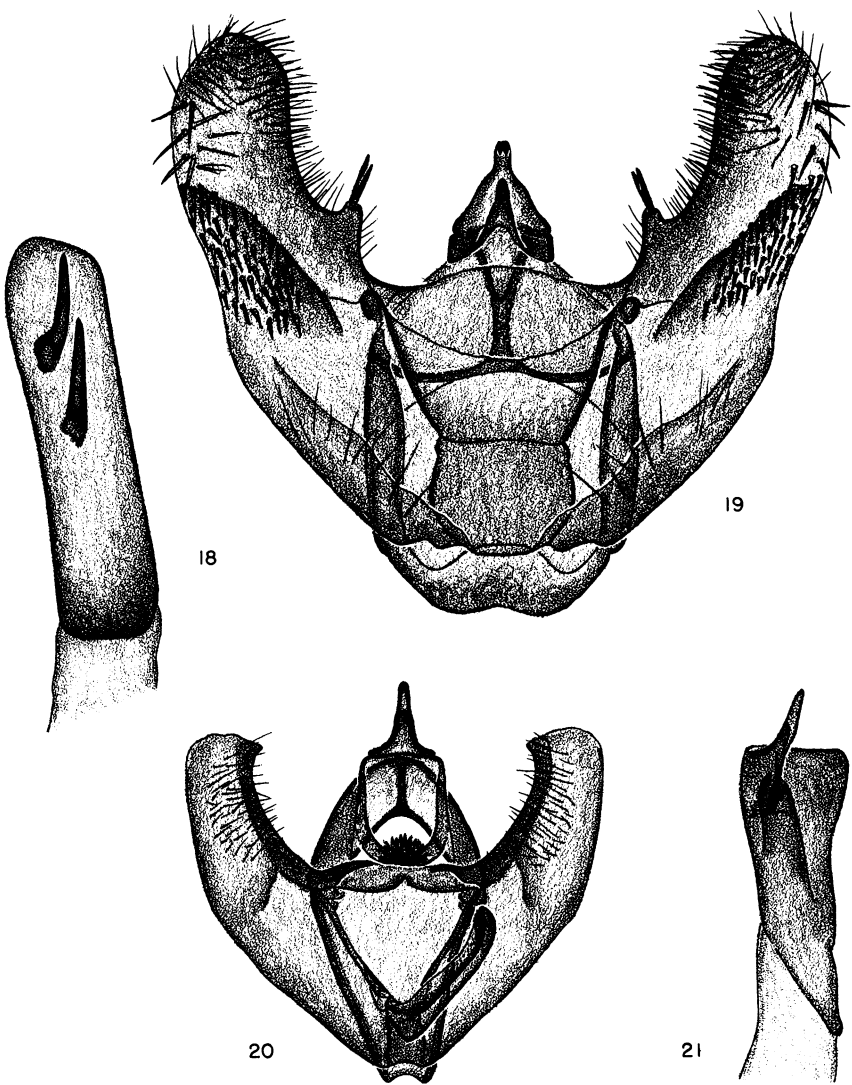
UNDER SURFACE OF WINGS: Ground color of wings grayish white, with variable amount of scattered gray or gray-brown scaling and striations, these sometimes concentrated in cell and at apex of primaries; forewings with costa and veins light yellowish brown, the former with black-brown scaling; maculation absent on all wings except for dark discal dots and diffuse, intravenular, terminal spots; fringe white.

Length of forewing: 18 to 21 mm.; holotype, 19 mm.

FEMALE: Similar to male, but with wings slightly more heavily suffused with dark scales; under surface of wings more heavily clouded with dark scaling also, with a tendency to be concentrated in terminal area on primaries.

Length of forewing: 19 to 22 mm.; allotype, 20 mm.

MALE GENITALIA: Uncus long, slender, curving ventrally; gnathos with median area bluntly pointed; valves slender, costa sclerotized, with a few slender setae near base and a row of heavier setae along in-



FIGS. 18-21. Male genitalia. 18. Aedeagus of *Euchlaena silacea*, new species, paratype. 19. Genitalia of same. 20. *Pityeja ornata*, new species, paratype. 21. Aedeagus of same.

ner margin extending from one-third of distance from base to spinose apex; sacculus sclerotized, narrowed near middle of lower margin of valve, continued apically as narrower, more heavily sclerotized band, slightly swollen apically and with numerous short, erect spines, ter-

minating just before apex of valve; anellus with triangular base, posteriorly with several folds; aedeagus slightly shorter or subequal in length to combined lengths of uncus, tegumen, and saccus, slightly tapered distally; vesica with elongate, heavy spine more than one-half of the length of the aedeagus, curved medially and bent back upon itself basally, with deciduous patch of very fine spines basally.

FEMALE GENITALIA: Sterigma with smoothly sclerotized, elongate dorsal plate, ventrolaterally with elongate sclerotized plates, convoluted at ostium, extending posteriorly and dorsally to past mid-pleural line; ductus bursae and corpus bursae not differentiated, posterior region longitudinally striate, lightly sclerotized, with rough surface, anteriorly gradually increasing in width after median narrowing; ductus seminalis arising to left side of mid-ventral line as broad tube, extending posteriorly and gradually narrowing; signum transverse, with anterior margin folded over, entire outer edge slightly stellate.

TYPES: Holotype, male, Huachuca Mountains, Arizona, July 8–15; allotype, female, same data but without date. Paratypes, four males and two females, same data as types, some without dates, others dated July 24–30, September 1–7; one male, Palmerlee, Cochise County, Arizona, July; one male, Desert Arboretum, Superior, Arizona, July 18–21, 1941 (A. B. Klots); three males and four females, Madera Canyon, Santa Rita Mountains, Santa Cruz County, Arizona, elevation 5800 feet, June 22, 23, 1955, July 12, 1956, August 1, 1947 (W. A. Rees, L. M. Martin, J. A. Comstock); one female, Santa Rita Mountains, Arizona, 5000–8000 feet, July (F. H. Snow). Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collections of that institution, of the Los Angeles County Museum, and of W. A. Rees.

This species is somewhat intermediate in appearance between the true *furfuraria* and *grisearia* Grote. The color of the wings of *arcana* is something like that of *grisearia*, but the maculation is not so distinct, being intermediate in this respect between that of *grisearia* and that of *furfuraria*. The best method of distinguishing the males is to check for the secondary sexual characters discussed under the generic heading, as they are absent in *arcana* but present in both *furfuraria* and *grisearia*.

As mentioned by McDunnough, the male genitalia are similar to those of *nigricaria* Barnes and McDunnough. The present species can be distinguished from the latter by its elongate uncus and by the large, recurved rod of the vesica. This latter character is present in both *grisearia* and *furfuraria*, but both of these species have the median

portion of the sacculus swollen and edged with spines, and they also have a shorter, apically bifurcate uncus. *Glena arcana* can be separated from *nigricaria*, *grisearia*, and *furfuraria* by the very large, lateral plates of the sterigma in the female genitalia.

***Euchlaena silacea*, new species**

Figures 3, 18, 19, 25

MALE: Head with vertex, front, and palpi orange-yellow, sometimes with vertex slightly paler. Thorax and abdomen orange-yellow above and below, the thorax with long, pale, hair-like scales; legs concolorous with thorax, hind tibia swollen, with hair pencil.

UPPER SURFACE OF WINGS: Forewings, ground color orange-yellow or pale yellow; t. a. line very faint, narrow, arising on costa about one-fourth of distance from base, going obliquely outward to cell, swinging sharply posteriad, and proceeding more or less directly to meet inner margin one-fourth of distance from base; discal dot small, dark; median shade line sometimes faintly indicated in lower portion of wing; t. p. line prominent, orange-brown, appearing in vicinity of vein R_5 , running with a slight curve to meet inner margin about two-thirds of distance from base; outer portion of wing slightly but broadly darkened distad of t. p. line and along outer margin, these two areas separated by indistinct band of ground color; apex of wing with small patches of dark brown scales in cells, separating area of ground color along costa and darker terminal area; terminal line absent; fringe concolorous with wing. Hind wings with strong scallop in cell M_1 and with smaller scallops in adjacent cells; ground color concolorous with forewings; antemedian line faint, appearing as continuation of t. p. line; discal dot small; postmedian line fairly prominent, concolorous with t. p. line, bifurcate between veins R and Cu_2 ; outer portion of wing not so heavily shaded as on forewings; terminal line absent; fringe as on primaries.

UNDER SURFACE OF WINGS: Ground color of all wings as above, sometimes slightly paler, with scattered dark brown scales; maculation as on upper surface, but with cross lines slightly darker, the postmedian line geminate; outer portion of wing paler than above.

Length of forewing: 19 to 23 mm.; holotype, 20 mm.

FEMALE: Similar to male, but with wing margin more dentate.

Length of forewing: allotype, 20 mm.

MALE GENITALIA: Uncus tapering from base, terminal portion with parallel sides, apex with two spines; gnathos with median portion elongate, bluntly pointed; valves with well-developed spine patch on

sacculus, and with numerous setae on costa beyond costal tubercle; aedeagus broad, with both ends semi-truncate; vesica armed with two heavy, well-sclerotized cornuti.

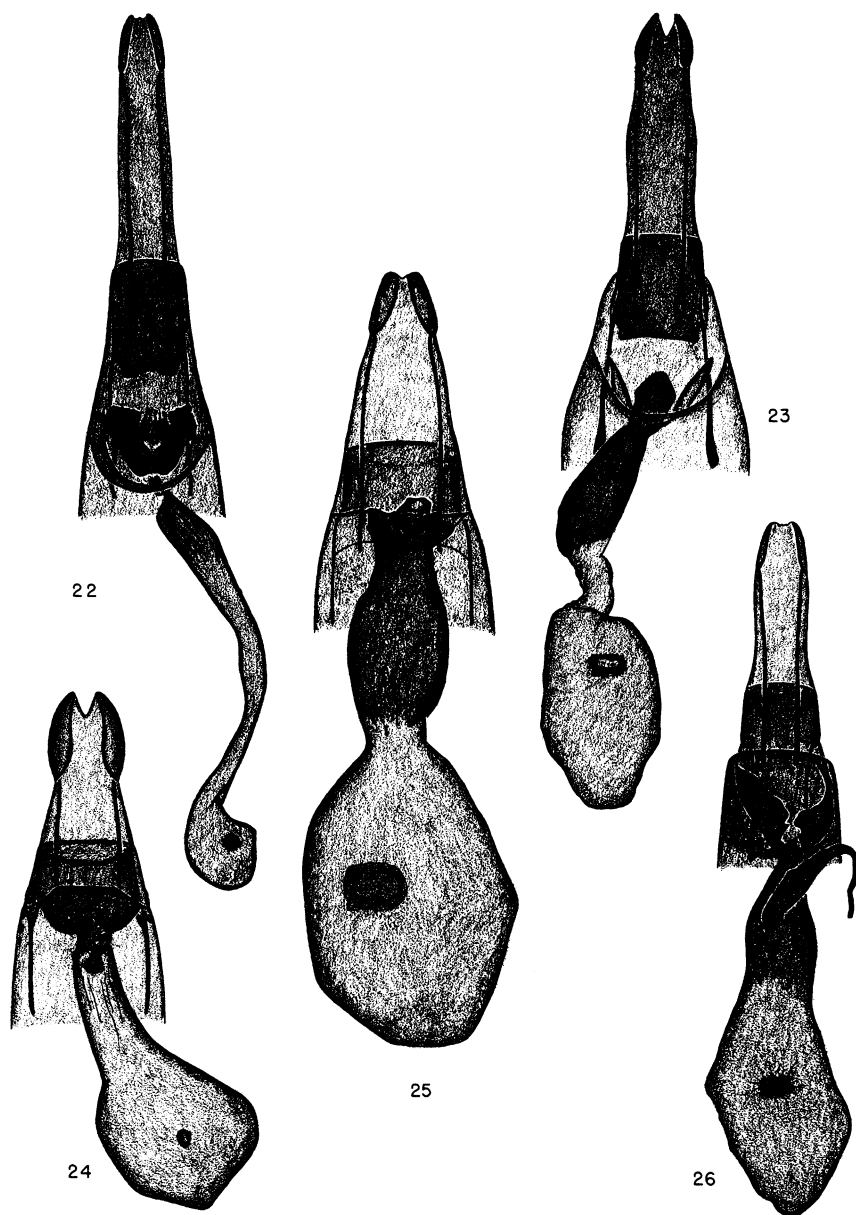
FEMALE GENITALIA: Ostial region with sclerotized sterigma, narrower than ductus bursae, tapering posteriorly, concave near ostium; ductus bursae constricted below ostium, then widened again, sclerotized for nearly twice the length of the apophyses anteriores, constricted once again, then enlarging to form membranous corpus bursae; signum large, elliptical, transverse.

TYPES: Holotype, male, and allotype, female, Vineyard, Utah County, Utah, July 11 (Tom Spalding). Paratypes, four males and one female, same data as types, July 11–12; two males, Trout Creek, Juab County, Utah, July 4, 1922 (Tom Spalding); one male, Platte Canyon, Colorado, July 22, 1909 (Osler); one male, southwest Colorado, August 27, 1907 (Osler). Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collection of that institution and in the collection of Otto Buchholz.

This species may be recognized by the clear orange-yellow or pale yellow color of the wings. Two other species occurring in the same general area are also yellowish in color, but the type of *manubiaria* Hulst is more brownish orange, has complete t. p. and postmedian lines, and the outer portion of all wings are contrastingly darker than the adjacent basal area. The second species is *madusaria ochrearia* McDunnough, a more ochraceous species with broadly geminate t. p. and postmedian lines, and without the swollen hind tibia and tibial hair pencil in the male.

The shape of the wings and the configuration of the wing margins are similar to those found in *obtusaria* Hübner and *decisaria* Walker. The shape of the secondaries in *silacea* does not have the deep indentation between veins R and M_3 of *decisaria*, but it is restricted to a single cell in width, with smaller scallops on each side. In this respect it is more like *obtusaria*, but the hind wings seem to have a more rounded outline in *silacea*, especially in the lower part of the wing.

The male genitalia place *silacea* in the group of species that includes *obtusaria* Hübner, *decisaria* Walker, and *muzaria* Walker, although none of these three is known to occur in the Rocky Mountains. All these species have a spine patch on the sacculus and two strong cornuti in the vesica. The spine patch of *silacea* is relatively small, and the spines are approximately twice as long as those found in the other species. The posterior cornutus is usually about one-fourth shorter than the anterior one in *silacea*, and the length of the former is usually



FIGS. 22-26. Female genitalia. 22. *Meriscisca scobina*, new species, paratype. 23. *Merisma ceraea*, new species, allotype. 24. *Pityeja ornata*, new species, paratype. 25. *Euchlaena silacea*, new species, allotype. 26. *Glena arcana*, new species, paratype.

equal to the maximum width of the aedeagus. In the other three species the two spines are either equal in length or the anterior one may be one-sixth or one-seventh longer, while the posterior cornutus is longer than the maximum width of the aedeagus.

The female genitalia are similar to those of these three species also, but may be distinguished by the longer and wider ductus bursae, with a larger portion of it being sclerotized, and by the much narrower sterigma, which is less than one-half of the width of the flared ostial end of the ductus bursae. In the species mentioned above, the sterigma is as wide as, or wider than, the end of the ductus bursae.

The author wishes to thank Otto Buchholz for the series of Utah specimens that has enabled this description to be written.

***Pityeja ornata*, new species**

Figures 4, 20, 21, 24

Pityeja picta BARNES AND BENJAMIN (*nec* Schaus), 1924, Contributions to the natural history of the Lepidoptera of North America, vol. 5, p. 186.

MALE: Head, vertex white; front pale buff, slightly darker dorsally; palpi creamy white. Thorax above white or creamy white, with some pale yellow-brown scales; below white; legs pale buff. Abdomen creamy white above and below.

UPPER SURFACE OF WINGS: Forewings, ground color pale creamy white, veins outlined in orange-brown except for Sc, Rs, and R_{1+4} ; base of wing of ground color, with numerous pale brown and orange-brown striations; t. a. line brown, prominent, arising on costa between one-fifth and one-fourth of distance from base, extending straight across wing to meet inner margin about three-fifths of distance from base, broadly shaded basally with paler brown; median area of ground color, with scattered pale brown and orange-brown striations, often more or less masking the elongate discal dash; t. p. line brown, prominent, arising on costa about two-thirds of distance from base, extending straight to about vein Cu_1 , sometimes slightly offset on veins, swinging basally with gentle curve and then outward again to inner angle, the line sometimes with a single row of scattered orange scales basally, broadly shaded with paler brown distally, this often extending to outer margin, especially in lower part of wing; subterminal area of ground color, of varying length and width, with some brown and orange-brown striations; terminal line dark; fringe pale brown. Hind wings white basally and along costal margin, becoming broadly suffused with orange, orange-brown, and pale brown scales distally and, to a lesser extent, along inner margin, becoming concentrated and

forming an orange patch of varying size above lower part of outer margin; without discal dot or cross lines; a more or less distinct, narrow, orange-brown line extending from lower end of cell to just above anal angle; terminal line more or less complete, dark, thickened to form spot in cell M_3 ; fringe whitish, becoming orange or orange-brown in lower portion of wing.

UNDER SURFACE OF WINGS: Ground color of all wings as above; forewings with maculation of upper surface reflected, but not so strongly represented; orange scaling absent and veins not outlined; hind wings mostly immaculate, only slightly darkened posteriorly.

Length of forewing: 15 to 18 mm.; holotype, 17 mm.

FEMALE: Similar to male, but with maculation and shadings of forewings dark brown or purplish brown, the areas of suffusion in basal and subterminal areas more reduced; hind wings with only small suffused area. Under surface similar to that of male but with more scattered dark scales on secondaries.

Length of forewing: 15 to 18 mm.; allotype, 15 mm.

MALE GENITALIA: Uncus subequal in length to width of its base, with posterior portion curving ventrally, apex bluntly rounded; gnathos with rounded median area thickly beset with short spines; valves with outer margin angled, posterior end of costa enlarged as small, inwardly projecting point; furca elongate, slender, in length slightly shorter than, or equal to, twice the width of base of uncus; aedeagus wedge-shaped, posterior margin truncate, posteriorly on left side with tapering, sclerotized, finger-like projection, in length longer than width of apical end of aedeagus.

FEMALE GENITALIA: Sterigma with a large, scoop-like, ventral plate; ductus bursae narrowed at junction with sterigma, lightly sclerotized; corpus bursae with a broad, tube-like, slightly striate neck, enlarging to a rounded corpus bursae; signum small, rather inconspicuous.

TYPES: Holotype, male, Southwestern Research Station of the American Museum of Natural History, 5 miles west of Portal, Cochise County, Arizona, elevation 5400 feet, June 25, 1955 (M. Cazier) and allotype, female, same data, August 9, 1956 (E. Ordway). Paratypes, five males and two females, same data as types, June 20, 22, 25, July 6, 1955, June 20, 1957 (M. Cazier and M. Statham); one male, Portal, Cochise County, Arizona, June 20, 1955 (M. Cazier); 12 males and nine females, upper camp, Pinery Canyon, Chiricahua Mountains, Cochise County, Arizona, June 26, 27, 1955, July 5, 9, 1956 (L. M. Martin, J. A. Comstock, W. A. Rees, R. J. Ford); one male and one female, Pinery Canyon, Chiricahua Mountains, Cochise County, Ari-

zona, July 4, 5, 1956 (C. W. Kirkwood); one male, Paradise, Cochise County, Arizona, June 8-15. Holotype and allotype in the collection of the American Museum of Natural History; paratypes in the collections of that institution, of the Los Angeles County Museum, of the United States National Museum, and of C. W. Kirkwood.

This species was originally identified as *picta* Schaus, from Jalapa, Veracruz, Mexico, based on a single Arizona specimen in the Barnes collection. Now that more material is at hand, it can be seen that two different but closely allied species are involved. Both have a very similar pattern and coloration, but *ornata* has a paler suffusion on the forewings in the male, giving a more washed-out appearance. The t. p. line in *picta* has a much stronger basal bend in the lower portion of the primaries, and both cross lines tend to meet the inner margin nearer the base than in *ornata*. The secondaries are less heavily suffused and striated than in *picta*, and the wing extension in cell M_3 is smaller.

The genitalia of both species show a correspondingly close relationship. The present species can be separated from *picta* by the shorter uncus, by the smaller and more rounded, median, spined area of the gnathos, by the angle of the outer margin of the valve, by the shorter, more triangular point at the end of the costa, and by the longer furca. The female genitalia are very similar, with those of *ornata* having a few more striations on the neck of the corpus bursae than do those of *picta*.