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NOTES ON NEOTROPICAL PLEBEJINÆ (LYCÆNIDÆ, LEPIDOPTERA)[1]

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In a recent paper[2] I briefly listed the only *Plebejinæ* (*s.s.*) found in the Nearctic region. Subsequently I decided to see whether any true *Plebejinæ* occurred in the neotropics besides the three or four species the genitalia of which I had happened to examine before. The results proved so unexpected and interesting that it seems worth while to publish the present paper despite its rather superficial and incomplete nature.

In order to cover more ground (and, in some cases, owing to the scantiness of the material at hand) only a very small number of specimens (about 120 in all) have been dissected and drawn (after a few *Catochrysopinæ* and representatives of other subfamilies had been weeded out by the same method). Some of these figures are appended. All the specimens, except a few supplied with his usual kindness by Mr. W. P. Comstock of the American Museum of Natural History, are preserved in the Museum of Comparative Zoology, Harvard.

A rather drastic rearrangement of the species and groups was an inevitable consequence of this investigation. Seven new genera have been introduced; two have been revised and restricted. In several cases it was found that forms had been assigned by recent authors to the wrong species. Some syno-

[1] Published with the aid of a grant from the Museum of Comparative Zoology at Harvard College.

[2] 1944 [Feb. 1945] Psyche **51**: 104–138, where the following errata should be corrected: line 12, p. 105, instead of "*hanno* Stoll" read "*ceraunus* Fabricius (*nom. spec.*)"; line 28, p. 107, instead of the misprint "*calliopsis*" read "*calliopis*"; p. 111, in the sentence beginning "A complete sequence . . ." transpose "palearctic" and "nearctic."

nyms have been tracked down, others are tentatively suggested but cannot be finally disposed of until the types are examined (or neotypes fixed). The brief bibliographical references given are merely intended to indicate the identity of the forms discussed. Beyond the inclusion of some random notes on certain phases of pattern, macroscopical characters are not discussed, and no attempt has been made to revise in this respect the (fortunately rather few) races that have received names.

In spite of the work accomplished since 1909, by Tutt and Chapman in England and by Stempffer in France, entomologists in this country employ the term "*Plebejinæ*" simply as a euphemism for the "*Lycæna*" of German authors, or "Blues,"[1] and "*Plebejus*" is used for a number of heterogeneous Nearctic species only *one* of which (*sæpiolus* Boisduval) belongs structurally to the genus of which the Palearctic *Plebejus argus* Linnæus is the type. In a way the initial blunder was Swinhoe's who while correctly giving a subfamilial ending to the group which Tutt's intuition and Chapman's science had recognized ("tribe" *Plebeidi* which exactly corresponds to the *Plebejinæ* of Stempffer) as different from other "tribes" (*i.e.*, subfamilies) within the *Lycænidæ*, failed to live up to the generic diagnoses which he simply copied from Chapman's notes in Tutt and tried to combine genitalic data he had not verified or did not understand with the obsolete "naked *v.* hairy eyes" system (which at Butler's hands had resulted in probably the most ludicrous assembly of species ever concocted, see for example Butler 1900, Entom. 33:124), so that in the case of several Indian forms which Chapman had not diagnosed, Swinhoe placed intragenerically allied species in different subfamilies and species belonging to different Tuttian "tribes" in the same subfamily.

In reality the subfamily *Plebejinæ* is extremely well differen-

[1] Thus McDunnough uses "*Plebeiinæ*" in his "Check List" of Nearctic Lepidoptera (1938 Mem. S. California Acad. Sci. 1:26), and thus Comstock uses "*Plebejinæ*" in his work on Rhopalocera of Porto Rico and the Virgin Islands (1944, *in* Miner, Scient. Survey P. R. and V. Isls. 12:492), but the two references the latter author appends (Swinhoe 1910, Lep. Indica 8:10 and Hampson 1918, Novit. Zool. Tring 25:385) are most misleading: the first, because *Syntarucus* Butler, a genus structurally indistinguishable from *Leptotes* Scudder (which is one of the two genera assigned by Comstock to "*Plebejinæ* Swinhoe") is placed by Swinhoe in a different subfamily, namely *Lampidinæ* (now known as *Catochrysopinæ*), and the second, because Hampson's (perfectly invalid) use of "*Plebejus*" and "*Plebejinæ*" refers to a section of a different family, namely *Erycinidæ* (now known as *Riodinidæ*).

tiated in all its genitalic elements (the ædeagus and its appendages, the tegumen, cingula, falces, uncus lobes and valves of the male, and the cervix bursæ and vaginal armature of the female) from the *Catochrysopinæ* (containing the holotropical *Leptotes* Scudder and a huge array of palæotropical species in several genera), the *Glaucopsychinæ* (containing, among others, the three holarctic genera *Glaucopsyche* Scudder, *Scolitantides* Hübner [to which *Phædrotes* Scudder and "*Shijimia* Matsumura" fall as synonyms] and *Philotes* Scudder), the *Everinæ* with the holarctic *Everes*, the *Lycænopsinæ* with the holarctic *Celastrina* Tutt (=*Cyaniris* Scudder, *nec* Dalman), *etc.*

The arrangement proposed in the present paper needs to be prefaced by a few words on taxonomic units. The strictly biological meaning forcibly attached by some modern zoologists to the specific concept has crippled the latter by removing the morphological moment to a secondary or still more negligible position, while employing terms, *e.g.*, "potential interbreeding," that might make sense only if an initial morphological approach were presupposed. What I term species, in my department, can be defined as a phase of evolutional structure, male and female, traversed more or less simultaneously by a number of, consequently, more or less similar organisms morphologically shading into each other in various individual or racial ways, interbreeding in a given area and separated there from sympatric representatives of any other such phase by a structural hiatus with absence of interbreeding between the two sets. In other words: 1. any two structurally indistinguishable individuals belong to the same species regardless of biological, physiological, geographical or any other factors; 2. structurally distinguishable sympatric non-interbreeding sets represent different species regardless of all other considerations; 3. structurally distinguishable sympatric individuals belong to the same species when they occur within an interbreeding set; 4. structurally distinguishable allopatric sets belong to the same species if the hiatus between their structures is completely bridged by intermediate structures in other, not necessarily intermediate, areas; 5. obviously allied but structurally distinguishable allopatric sets not linked by such intergrades can be said to belong to different or the same species only by analogy, *i.e.*, by analysing the structural gaps between sympatric species or individuals possessing the same general type of structure. Conditions 2 and 4 do not

exclude each other and so it may happen that two structurally distinguishable local forms belong to one species allopatrically because they racially intergrade, but at the same time belong to different species sympatrically because in some other region their structural counterparts occur side by side without interbreeding (this incidentally is the position in *Lycœides*). In such cases one should give precedence to the all important sympatric moment and find somewhere in the spirals of racial intergradation a point at which the whole system can be elegantly, in the mathematical sense (for we are dealing with measurable structures), divided into two parts, *i.e.*, two species, using some combination of trinomials to designate this or that interspecific form (*e.g.*, *Lycœides scudderi doei* Roe *trans ad melissa roei* Doe). This state of affairs is not a flaw in the concept of "species" but an indirect result of its dual nature ("structure" plus "reproduction," "male" plus "female" *etc.*) and should be accepted by the taxonomist with perfect equanimity.[1]

The impact on the eye of a combination of characters in the whole structure or in an element of it, results in the perception of certain structural types. Structures of the same type imply phylogenetic affinities unless it can be proved, as in some cases it is easy to do, that the resemblance is "false" *i.e.*, attained by essentially different means. Such false resemblances are extremely rare and the number of characters involved is small, and this is as it should be, since such "convergence" depends upon the mathematics of chance. False dissimilarities also occur (and are also rare), *i.e.*, the striking difference between one type and another is seen, when analysed, to be due to a simple and brief process of evolution in an unusual direction.

Unless we believe that certain structural resemblances and dissimilarities are not due to chance or to gross adaptional modifications, but can be classified according to their phylogenetic sense, all horizontal genera are artificial groupings — of some practical use to collectors (*e.g.*, the convenient lumping of all small blue butterflies with rounded hindwings and dotted undersides in one "genus") but of no scientific value. This brings us to the question as to whether a classification on the

[1] "Subspecies" (on which I hold rather special views which I shall discuss elsewhere) may be briefly defined as a locally constant phase of specific alar characters with or without a local fixation of some stage within the graded variational range of the specific genitalic structure. The days are quite gone when easy-going describers could give names to these things without a detailed study of genitalic and pattern characters throughout the polytypic species or genus involved.

basis of genitalia reflects natural relationships better than do other principles. I think the answer is "yes."

A "polytypic genus" is determined by structural characters which are common to all the species it includes and the particular combination of which, more than the presence of some particular detail, no matter how striking, distinguishes the group from any other. A "monotypic genus" (*i.e.*, a structurally isolated species which does not fit into any known generic group) obviously lacks the first feature while the number of characters entering the distinctive combination is vastly increased by practically coinciding with the whole array of specific characters, so that the only "reality" a monotypic genus has, lies in the implication that the only species it contains is the only one "known" and that if others were "known," a common denominator now "hidden" in the monotypic genus would be revealed. Among polytypic genera, a "natural genus" is one which reflects the flickering, as it were, of a strongly differentiated type of combinational structure within limits as narrow *per se* as, say, the range of continuous variation within a structurally highly polytypic species, and thus consists of specific structures resembling each other more than they do any other species. If h_1, h_2, h_3, h_4 denote the interspecific hiatuses, and H_1, H_2, etc. the intergeneric ones, then the lesser the h's and the larger the H's, the more "natural" the genus is — and the more liable it is to be transformed into a polytypic species by the next reviser with more material at his disposal.

A certain harmony, as yet rather obscure, seems to exist between a particular type of male armature and a particular female one; this has been taken into account in founding the genera discussed below. The impression I have formed so far that with "natural genera" specific differentiation in these organs is more marked (or at least easier to observe) in the male may be due to insufficient investigation, but anyway I cannot find any *exact* correlation between female lock and male key. In what manner and to what extent the sclerotized parts of the sexes in *Plebejinæ* fit each other during copulation is not clear, but I doubt whether the valves, the termination of which is evolutionally the most vulnerable part, come into any direct contact with such structures in the female organ that might lead to some intersexual adaptation.[1]

[1] Lorkoviz states (1938, Mitt. Münchner Ent. Ges. 28:231) in an admirable paper on the European representatives of *Everes* (*Everinæ*) that in that genus

Adaptation to surroundings, to climate, altitude *etc.*, and hence "natural selection" in its simplest sense, certainly had no direct action whatever on the moulding of the genital armature, and we know nothing of the physiological processes of which that elaborate sculpture is the structural overflow. While accepting evolution as a modal formula, I am not satisfied with any of the hypotheses advanced in regard to the way it works; on the other hand, I am quite certain that repetitions of structure, on the Siberian tundra and on the paramos of the Andes, on a mountain in India and on an island in the Caribbean Sea, cannot be treated as a result of haphazard "convergence" since the number of coincident characters in one element, let alone the coincidence of that coincident number with a set of characters in another element, exceeds anything that might be produced by "chance." Hence the conviction that there is *some* phylogenetic link where there is a recurrence of similar genitalic characters and that certain groupings — the new genera to which we now must turn — may be so devised as to reflect the natural affiliations of the species.

Plebejinæ

Stempffer, 1937–1938, Bull. Soc. ent. France **42**: 211–218, 296–300; Nabokov, 1944, Psyche **51**: 104–105; = *Plebeiidi, sensu* Tutt [*et* Chapman], 1909, British Butt. **3**: 150–159; Chapman, 1910, Ent. Rec. **22**: 101–103; 1916 Trans. Ent. Soc. London **1916**: 157–180; = "*Plebeius* + *Polyommatus*" *s.* Bethune Baker, 1914, Ent. Rec. **26**: 164; *Polyommatinæ*, Forster 1938, Mitt. Münchner ent. Ges. **38**: 111–116.

Parachilades n.g.

(fig. 1, figs. TIT, pl. 2,7)

Type and only known species *Lycœna titicaca* Weymer 1890 (*in* Reiss *et* Stübel, Reisen in Süd-America, Lepidoptera :122–123 "Titicaca Lake; Sajama, Bolivia," pl. 4, fig. 6 [very poor]; *Itylos* [*s.l.*] *titicaca*, Draudt, 1921, *in* Seitz, Macrolep. World, **5** :122, pl. 144, m [coarse copy of original fig.]; *Cupido speciosa*

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the median uncal projection (a structure not found in *Plebejinæ* and wrongly, in my opinion, regarded as being formed by the fusion of the uncus lobes) fits exactly the vaginal plate of the female, both varying together according to the species. See also Chapman 1916, Trans. Ent. Soc. London **1916**:170.

Staudinger, 1894, Iris 7 : 77–78, "Huallatani and Quebrada Malaga, Bolivia"; *Lycæna speciosa, ibid.*, pl. 2, fig. 8 ♂ ; *Itylos* [*s.l.*] *speciosa*, Draudt, 1921, *l.c.*, pl. 144, n, figs. ♂ ♀).

Five males and one female investigated: prep. 610, "Titicaca

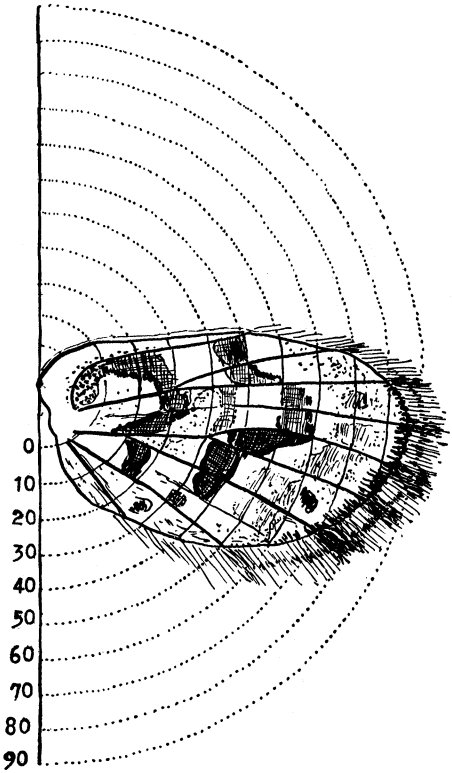


FIG. 1. *Parachilades titicaca*, left hindwing underside x7.

[Lake], Bolivia," *ex* coll. Huntington [*ex* coll. Staudinger-Bang Haas], Amer. Mus. Nat. Hist.; prep. 483, 488, 589, 620, ♀ 590, "Sicasica, Bolivia, 1.X.1899" *ex* coll. Weeks, Mus. Comp. Zool.

Ædeagus thickish,[1] about 1 mm. long, the suprazonal portion subequal to the subzonal one. In general type fairly close to

[1] In all genera examined the subzonal portion of the ædeagus appears in cross-section as a dorso-ventrad directed oval, the lengthening of which produces the appearance of "thickness" in the organ when the latter is viewed from the side.

Chilades (see pl. 2, CON 1), still more curved, however, with a pronounced bulging of the outline (in lateral view) dorsally at the zone (above the zone and less conspicuous in *Chilades*) and a somewhat different structure of the suprazonal portion. Suprazonal sheath terminating on the ventral side in a point (which is not notched as it is in *Chilades*) with two filament-like lateral portions (structurally similar to the spine-like single medial process described by Chapman in other genera and represented in *Chilades* [1]) diverging from it and rimming the vesica, the erected (everted) frothy membrane of which they seem to prop. Vesical opening (on the dorsal side) beginning just above the zone (thus at a more proximal point than in *Chilades*). Vesica very simple and weak as in *Chilades*, *Freyeria*,[2] *Lycœides*, etc. Alulæ considerably more developed than in *Chilades*, forming two petals almost 0.3 long and resembling (or representing) rudiments of the peculiar element (sagum) that exists at various degrees of development in several other neotropical genera where, however, it is well differentiated from the alulæ (except in *Hemiargus*). Furca considerably smaller in relation to the ædeagus than in *Chilades*, singularly thick, pincers-like, connected at its tips with the petals of the alulæ. The whole dorsum (falx + uncus lobe + tegumen) remarkably similar in type to *Chilades*, which type is characterised by the breadth of the robust and long forearm exceeding that of the long finger-shaped uncus lobe,[3] by the humerulus appearing to be produced (owing to the exiguity of the lobe) not from the base of the lobe but from the tegumen proper, and by the latter being smaller by comparison to the falx and the lobe than in other *Plebejinæ*. Differing from *Chilades* in the greater size of the falx and uncus lobe in relation to the rest of the armature and to the size of the

[1] One wonders whether this medial process in *Chilades* is not, perhaps, merely a lesser stage of development of the pointed part of the sheath of *Parachilades*, while the lateral processes in the latter represent a lesser stage of development in comparison to the latero-ventral pointed sheath portions of *Chilades*. I am not fully satisfied with my observations in regard to the ædeagus of these two genera.

[2] I fail to find in either of the two species of *Freyeria* (*trochilus* and *putli*) the cornuti mentioned in the case of *trochilus* by Stempffer (1937, Bull. Soc. ent. France 42:215).

[3] In fact Fruhstorfer, the only German writing author of his time who made any attempt to follow the British authors in the study of Lycænid genitalia for systematic purposes, in an enthusiastic, but amateurish, and poorly illustrated paper on *Chilades* (1916 Zool. Meded. Leiden, 2:90–95) mistook the uncus lobes of *lajus* and *cleotas* for an additional pair of falces (besides confusing generic characters with specific ones).

wings.[1] Falx very big, long and thick, fatter than in *Chilades*, and not distinctly separated to the eye into its components (humerulus, elbow, etc.) owing (1) to its not bunching at the shoulder as it does in *Chilades* (in ventral view); (2) to the unusual (unique in *Plebejinæ*, typical in *Catochrysopinæ*) slant in the part that corresponds to the, very upright, forearm of *Chilades*, with a consequently wide and weak falcal arch; and (3) to its even breadth from basal point to almost three-quarters of its length; thus of a limacine appearance increased by the fact (again unique in this subfamily, but frequent in *Catochrysopinæ*) that in ventral view the point of the oblique falx seems twisted away from the lobe instead of curving hookwise toward the latter as it does in *Chilades* (or other genera) where it attains the tip of the lobe. Uncus lobe narrow and long, exceeding the length of the tegumen (from base of falx to beginning of cingula) which is not the case in *Chilades* nor indeed in any other genus of the subfamily; tapering above the humerulus to form a finger-shaped projection of even breadth throughout; slightly excurved (in contrast to the straight "gothic" projection in *Chilades*) and at least 1½ narrower than the forearm. Valve exceedingly small and squat, about half the ædeagus and about equal to the falx in length, the first proportion only approached in one other species of *Plebejinæ* (*Hemiargus ramon* Dognin) and the second unique in the subfamily (but common in other Lycænids); of a peculiar stunted appearance, shaped like an elephant, about one and two-fifths as long as broad, thus strikingly different from the elongated shape of *Chilades* and all Old World members of the subfamily; with a strongly and evenly curved processus superior ending in a thickish gradually tapering rostellum (about a third of the valve in length), which continues the even curve of the whole upper margin and comes to rest upon the well-developed, strongly jutting mentum, the tip of which may assume a fluted appearance *in situ*.

Female: fibula of ostium bursæ strongly developed, of the *Chilades* type, with the upper lamella conspicuously long (about 0.3 mm.). Papillæ anales about 0.45 mm. broad and very large in relation to the short looking rods (about 0.6).

Measurements (in mm.): ædeagus 0.9–1, suprazonal portion

[1] The *titicaca* lobe length is only attained in *Chilades* by one species (*cleotas*, pl. 2, CLE 3) in which the whole alar surface is 5.4 times greater and the forewing 2.5 times longer than in *titicaca*, while in *galba* forms (e.g. pl. 2, CON 3)

0.44–0.52 (mean 0.49), subzonal 0.44–0.54 (mean 0.49); breadth (in lateral view) at zone 0.16, proximad 0,12; penis mean 0.85. Furca 0.37. Falx 0.5 by 0.07 to 0.55 by 0.1 (mean 0.52 by 0.08); uncus lobe 0.5 by 0.045 to 0.55 by 0.055 (mean 0.52 by 0.05). Valve 0.54 by 0.39 to 0.55 by 0.4 (mean 0.54 by 0.4).

It is possible that individuals or broods or racially constant forms of *titicaca* with a complete underside forewing set of (seven) II macules and (seven) split I macules exist somewhere in the Andes. The general tendency, however, is to complete obsolescence (Staudinger selected for his figure of "*Lycæna speciosa*" an individual with still visible I RM and M_1II and M_2II; Weymer's only fresh specimen had none). The narrow and pointed (almost tineoid) wing-shape is found elsewhere among *Plebejinæ* of great altitudes (*e.g.* in a Himalayan form of *Albulina orbitulus Prun.*). In the hindwing (see fig. 1), the termen strongly recedes (below vein M_2) from scale line 85 to 50 (at vein 2A). The I macules are obsolescent, except the CU_1 præterminal mark which is distinctly pigmented in some specimens. The II macule is weakly pigmented (except marginally, especially along the outer edge in most specimens) from Sc to cell M_2 (between, roughly, scale lines 30–40, 35–50, 50–60, 50–60), fairly strongly (with very strong edges) from M_3 to cell Cu 2 (35–60, 30–40, 30–35,) and is very weak in 1A and 2A. The III macule is weakly pigmented (except the proximal edge) in Sc (0–20) and fairly strongly (with still stronger edges) in Cu_2 (10–20). The I discoidal RM (30–35) is very weak while the II one (R 12–25+M 5–25) is fairly strong (with still stronger edges). All the macules except the anal ones and the Cu_1 præterminal mark (60–65) fill the transverse breadth of the interspace (forming, if viewed from the termen a capital omega in the case of the II series, and a somewhat similar design in the case of Sc III, II RM, Cu_2 III) and are squarish, or of a roughly triangular shape if extending to 15 or more scale lines (along the upper vein of the cell as Sc III and Cu_1 II do, or along the lower one as II M and R_s II do). I give these scanty notes and a figure, since no intelligible description of the species exists.[1]

where dwarfs from Cyprus approach my largest *titicaca* (length of fore wing 8.5 mm.) in wing span (though of course the wings remain always much fuller than in *Parachilades*), the lobe is at least twice smaller than in the latter.

[1] For a full discussion of the terminology employed see my paper (1944 *op. cit.*) on the pattern of *Lycænidæ* as expressed in *Lycæides*.

Pseudothecla n.g.

(figs. FAG, pl. 2)

Type and only known species: *Thecla faga* Dognin 1895, Ann. Soc. ent. Belgique **39:** 105–106 "Loja, Ecuador" (= ? *excisicosta* Dyar 1913, Proc. United States Natnl. Mus. **45:** 637–638 "Cotahuasi; Chuquibamba, Peru").[1]

One male investigated: prep. 611, "Peru," *ex* coll. Huntington, Am. Mus. Nat. Hist. (with a somewhat more weakly marked underside than Dognin's description suggests).

Ædeagus two-thirds of a millimeter in length, very slightly incurved distally, rather thickset, not unlike certain *Plebejus* species in type, the suprazonal portion hardly more than half the subzonal one in length, the vesical opening at 0,8 mm. from the zone, the vesica plain, rather weakly defined, thickly shielded ventrally by the suprazonal sheath; alulæ and tabs small. Furca resembling *Parachilades*, the branches still thicker, conspicuously curved, equal in length to the subzonal portion of the ædeagus. Traces of a thin membrane (? rudiments of sagum) between the latter and the furca. Falx bearing a general resemblance to certain *Plebejus* and *Vacciniina* species, its outline, however, more evenly rounded throughout. Forearm slim, incurved, tapering to a sharp point, subequal to the suprazonal portion of the ædeagus, humerulus thickish with a weak shoulder. Uncus lobe small, shorter than the forearm, rather narrow and blunt. Valve of the normal (fishlike) subfamilial shape, but exceedingly small, subequal in length to the ædeagus, about twice as long as broad, nicely tapering basad. Processus superior strongly scooped out at the rostellum which thus seems to be produced from a point lower than the upper margin of the valve and is curiously shaped: anteriorly forming a sharp point, posteriorly producing a kind of small heel at about half of the length of its inner margin.

Measurements (in mm.): ædeagus 0.67, suprazonal portion 0.24, subzonal 0.43 with breadth (lateral view) 0.11; penis 0.64. Furca 0.44. Vertical/Horizontal extension of uncus: forearm 0.27/0.033, humerulus 0.07/0.14, shoulder 0.11/0.05, lobe 0.2/0.06. Valve 0.65 (to tip of rostellum 0.76) with breadth 0.31.

This is a very curious addition to the subfamily.

[1] *Sylphis* Draudt 1921 (*in* Seitz, Macrolep. World **5:** 823, "Cuzco (Peru)," pl.

Pseudochrysops n.g.

(figs. BOR, pl. 2,7)

Type, and only known species: *Hemiargus bornoi* Comstock-Huntington 1943 (Ann. New York Acad. Sci. **45** : 102–104, "Pont Beudet, Haiti," pl. 1, figs. 18 ♀, 19 underside; Comstock, 1944, Rhopalocera, *in* Miner, Scient. Survey Porto Rico and Virgin Isls. **12** : 498–499, fig. 16 venation).

Two male paratypes and one female paratype (all *ex* coll. Am. Mus. Nat. Hist., Mus. Comp. Zool.) investigated: prep. 496, 604, ♀ 605, all "Pont Beudet, Haiti, about 100 ft., 3–4–III–1922."

Ædeagus slim, elongated, 1 mm. long, suprazonal portion equal to subzonal one; ventral part of subzonal sheath slightly notched distally, acuminate in lateral view; vesical opening high, about half-way up from the zone, alulæ small, Chapman's process slight, vesica weak, unarmed, the whole organ vaguely intermediate between *Chilades* and *Freyeria*.[1] Sagum rudimentary, in the form of two weak ill-defined lobes produced from the zone ventrad. Furca well developed, in length subequal to the subzonal portion of the ædeagus, of a conventional subfamilial shape, but with a broad membraneous lining giving it a lobed appearance *in situ*. Falx and uncus lobe different in type from *Chilades* although related to it in general elongation, much more strongly developed than in *Freyeria*, but otherwise definitely allied to the latter. Forearm more than a third of a mm. long, slightly overtopping the uncus lobe, remarkably slender and straight, very gradually tapering to a minutely hooked point, elegantly elbowed, more finely drawn and direct that in *Freyeria*, similar in these features to *Lycœides melissa* Edwards, but combined with a differently shaped, comparatively high shoulder, as in *Freyeria*, only finer in outline. Humerulus more than twice shorter (horizontal extension) than forearm (vertical extension), remaining evenly slender, and hardly thicker (vertical extension) than forearm (horizontal extension), for slightly over half of its length from elbow point, then abruptly expanding to almost double of its vertical extension to form a delicate, small but conspicuous shoulder, its out-

144, n) ought to be also checked in relation to *faga* (*op. cit.* : 823–824, pl. 144, m). Both are doubtfully placed by Draudt in *Scolitantides auct.*

[1] *Freyeria* is less close to *Chilades* than to *Lycœides*, its nearest ally.

line convex posteriorly and somewhat concave below its prominent anterior point. Uncus lobe very long, thicker and blunter than in *Chilades*, somewhat related to *Plebejus*, slightly excurved, just above one-half the length of the tegumen proper, twice broader than the forearm and more than five times as long as broad. Valve bearing a false resemblance in shape to *Iolana* Tutt (*Glaucopsychinæ*); in general proportions likewise resembling *Parachilades*; in character of rostellum somewhat allied to *Pseudothecla*; in basic structure truly allied to the next genus; very short, at its broadest (very distal) part about three-quarters as broad as long, shorter than the ædeagus, about sixteen times shorter than the length of the forewing (which is about 11 mm.) [the latter ratio being one-eighth in *Freyeria* (about 7 mm.) where, as in all Old World *Plebejinæ*, the valve is longer than the ædeagus], subtriangular, strongly expanding from its bluntly rounded base to form a buffalo hump; the process superior abruptly sloping from that point to evenly rise again at a point immediately below whence it projects distad as a slender, very slightly incurved, horn-like rostellum, in length just under one-sixth of the whole process. Stretch between rostellum and mentum extensive and steep, lending the valve a gaping appearance, this effect being due not to any special feature of mentum or distal margin of valval membrane, but to the rudimentary or aborted (despite the horn-like free end) condition of the upper process which in all other *Plebejinæ* is long enough to allow the rostellum to rest on the mentum.[1]

Female: fibula well developed, about 0.16 long by as much broad, consisting of a triangular portion over an oppositedly directed cordate one. Papillæ anales small, about 0.3 broad by 0.2 long with comparatively very long (0.82) rods.

Measurements (in mm.): ædeagus 1, suprazonal portion 0.5, subzonal 0.5 with breadth (in lateral view) 0.11; penis 0.93. Furca 0.47. Sagum 0.33. Vertical/Horizontal extension of un-

[1] *In situ* the end of the processus superior of *bornoi* tends to be infolded, *i.e.*, to overlay the ventral concavity of the valve as occurs also in *Parachilades*, *Chilades*, and *Hemiargus* (*s.s.*). Another character of these valves (and also that of the next genus) which lack the regular bullula of other genera is the fact that under pressure the whole margin below the rostellum has a trick of bulging (producing as it were a second mentum), a circumstance which incidentally misled Bethune Baker (1913, Trans. Ent. Soc. London **1913**: 201–204) in his rather confused attempt to separate what he called *phiala* Grum Grshimailo (of which he examined, at the best, a locotype or cotype — not the actual type as wrongly stated : 204) from the absolutely conspecific *galba* Lederer.

cus : forearm 0.35/0.03–0.36/0.025, humerulus 0.04/0.17, shoulder 0.1/0,07, lobe 0.36/0.065. Valve 0.63–0.66 with breadth 0.5. Rostellum 0.18.

In pattern characters this rare and remarkable butterfly belongs, together with a few other genera or aberrant species, to what may be termed the "catochrysopoid" pattern group in *Plebejinæ* (some notes on the subject will be found further on and at the end of this paper), none of the members of this group having, however, any structural connection whatever with the *Catochrysopinæ* genitalically. Moreover, the present assignment of *bornoi* and *faga* to the true *Plebejinæ* adds two "tailed" species to the small number (all in *Chilades*) already known (first recognized by Chapman 1916).

Cyclargus n.g.

(figs. DOM, AMN, WOO, TH, pl. 3; AMN, pl. 7)

Type: *Lycæna ammon* Lucas 1857

Four species known[1]:

ammon Lucas (*Lycæna*, 1857, Lép., *in* la Sagra, Hist. . . . Cuba **7** : 612, "Cuba," pl. 16, figs. 7 ♂, a ♀, b; *Lycæna filenus* Holland [*nec* Poey] 1931, Butt. book, pl. 68, figs. 2 ♀ [*nec* ♂], 3 ♀, 4 ♂; *Hemiargus ammon ammon*, Comstock-Huntington, 1943, Ann. New York Acad. Sci. **45** : 95–96; "Havana, Cuba, winter brood").

dominica Möschler (*Lycæna*, 1886, Abhandl. Senckenberg, naturforsch. Ges. **14** : 26, "Jamaica," fig. 10 [*fide* Comstock-Huntington, 1943, *op. cit.* : 101–102]; *Hemiargus ammon f. dominica*, Draudt, 1921, *in* Seitz **5:** 820; *Hemiargus dominica*, Comstock-Huntington, 1943, *l.c.*).

thomasi Clench (*Hemiargus catilina auct. ssp.*, 1941, Mem. Soc. Cubana hist. nat. **15** : 407–408, "Arthur Town, Cat. Isl., Bahamas"; *Hemiargus bahamensis* Clench, 1943, Psyche **49** : 57, "Crooked Isl., Bahamas") comprising *thomasi thomasi* Clench (*Hemiargus ammon thomasi*, Comstock-Huntington, 1943, *op. cit.* : 97 "Bahamas"), *thomasi bethune bakeri* Comstock-Huntington (*Hemiargus ammon ssp.*, 1943 *op. cit.* : 97–99, "Miami, S. Florida, winter brood," pl. 1, fig. 25 ♂ ; *Hemiargus catilina* Bethune Baker [*nec* Fabricius] 1916, Ent. News

[1] Listed in chronological order. The obvious systematic sequence is: *dominica, ammon, woodruffi, thomasi.*

27 : 454; Holland, 1931, *op. cit.*, pl. 30, fig. 45 ♀, pl. 31, fig. 31 ♀) and *thomasi noeli* Comstock-Huntington (*Hemiargus ammon ssp.*, 1943, *op. cit.* : 99–100, "St. Marc, Haiti" pl. 1, fig. 23 ♂).

woodruffi Comstock-Huntington (*Hemiargus ammon* ssp., 1943, *op. cit.* : 100–101, "Anegada, Virgin Isls.", pl. 1, fig. 24 ♂).

Generic Description

Ædeagus in a very general way allied to *Pseudochrysops*, smaller, stubbier, from just under 0.65 to just over 0.8 long; suprazonal portion about half or just over one-half the subzonal one; ventral side of suprazonal sheath notched distally; vesical opening beginning at about half-way or two-thirds from the zone on dorsal side, at first very narrow, with distinct lateral portions then brusquely allowing the vesica to expand; the latter very plump (facing more or less distad), in lateral view not unlike a pin cushion, in dorsal view resembling a bourbon crown; set with about 120–160 comparatively large (0.003) cornuti in several regular rows of about ten and more or less distinctly divided by the thin point of Chapman's process; alulæ and subzonal portion of the usual type in the subfamily, the former about 0.1 long, the latter compressed laterally, broader in lateral than in ventral or dorsal view. Furca small, slightly shorter than the subzonal portion, more efficiently holding it in the forking than in Old World types. Sagum well developed, consisting of two convex (ventrad) lobes about 0.4 long by 0.2 broad, connected at the zone with the alulæ, and below the zone with the points of the furca, converging in front (*i.e.*, on the ventral side) of the ædeagus in the manner of a stiffly bulging short waistcoat, too ample as it were for the body it encloses, and edged at and along its margins (which appear distally projected in lateral view and thus differ from other sagum bearing genera to be discussed) with conspicuous teeth reaching 0.03 in length. Uncus, especially falces, extremely small and weak. Falx allied in type only to one Old World genus, namely *Aricia*; in shape resembling a beheaded dromedary, the part of the "neck" being taken by the straight, rather bluntly tapering, plain-tipped vertical projection (forearm) of the falx, and the "hump" being represented by the high evenly shaped vertical shoulder of the medially thickish, straight, rather long hori-

zontal extension (humerulus) of the falx (see pl. 1, fig. 4). Uncus lobe subtriangular *in situ*, spoon shaped when slightly compressed in flat ventral view, from slightly to one-fifth longer than the falx and hardly two-thirds the length of the lobe of *Pseudochrysops bornoi*. Valve allied to that of the latter but better developed in the processus superior, thus approaching a more normal (though still very squat) *Plebejinæ* shape which it resembles only insofar as a puffer resembles a pike; very small and short, hardly attaining the length of the ædeagus, twice or less than twice as long as broad, heavily humped; the hollowed outline formed by the mentum (which here seems somewhat upturned *in situ*) and the (strongly receding here) margin of the body of the valve extending laterally (*i.e.*, subparallel to the long axis of the valve) rather than "vertically" as it does in *bornoi* (where the upper process is poorly developed); the free part of the upper process (rostellum) throughout its length snugly resting upon and merging with the hollowed margin, but when manipulated seen to be sinuous, flexible looking and long; ending in a more or less broad coxcomb with well developed or greatly developed teeth oriented along the long axis of the valve, longer relatively to it than in other *Plebejinæ* (except one palearctic species, *Plebejus argus* L. where, however, they point obliquely down as in *Itylos, sensu mihi*), and providing the main characters for distinguishing the four species.

Female: fibula resembling *P. bornoi* but shorter (0,1 long by as much broad distally and twice broader proximally). Everted henia stumpy and short.[1] Papillæ anales about 0.3 long by 0.3–0.4 broad, with rods 0.7 long, thus shorter (both in relative and absolute size) than in *bornoi*.

Cyclargus dominica Möschler

(figs. DOM, pl. 3)

Two males investigated: prep. 501, "Baron Hill, Jackson Town, 1200 ft., March, *leg.* L. Perkins," Mus. Comp. Zool., and 508, *id.*, "July," *id.*

Ædeagus 0.75 long, suprazonal portion shorter by half than

[1] My impression is that the extensibility of the henia and its prop so marked in all *Plebejinæ* (see Chapman, 1916 *op. cit.*) is more limited in *Pseudochrysops*, *Cyclargus* and *Hemiargus* (*s. mihi*) in contrast to the rest of the neotropical genera examined which conform to the Old World type in this respect. I have dissected, however, only a few females and my results should be checked on more material.

the subzonal one with a weakly excurved, somewhat slipper-shaped suprazonal sheath, which opens dorsally at about one-third from the zone. Forearm subequal to uncus lobe. Valve twice as long as broad. Comb narrow, with receding edge; 12 to 16 teeth: first and second equal, slightly broader than, but otherwise as long as, the rest which are sharp and subequal *inter se* except for a perceptible reduction in the last three or four.

Measurements (in mm.): ædeagus 0.75, suprazonal sheath 0.25, subzonal 0.5 with breadth (in lateral view) 0.14; penis 0.65. furca 0.45. sagum 0.45. Vertical/Horizontal extension of uncus (prep. 501): forearm 0.22/0.05, humerulus 0.07/0.19, shoulder 0.13/0.07, lobe 0.23/0.06. Valve 0.55–0.7 with breadth 0.33–0.35; comb: breadth 0,12; first and second tooth: length (bisetrix from apex to line prolonging basad the outer edge of third tooth) 0.016 and 0.016.

Cyclargus ammon Lucas

(figs. AMN, pl. 3)

Three males and two females investigated: prep. 507, "Sierra Maestra, East Cuba, 1000 ft., 16–VI–1930, *leg.* Clorinda Querci," *ex* coll. Weeks, Mus. Comp. Zool.; 375, *id.* "23–VII–1930" *id.*; N, *id.*; ♀ 530, *id.*, "3–XI–1929, *leg.* O. Querci," *id.*; ♀ 529, "Cuba, *leg.* Ch. Wright," Mus. Comp. Zool.

Differing from *dominica* in the following: Valve somewhat broader; comb broader, with circular edge; first and second tooth (equal) one-third longer than in *dominica* and the rest somewhat broader than in that species.

Measurements (in mm.): ædeagus 0.63–0.75; suprazonal portion 0.23–0.25, subzonal 0.4–0.5 with breadth (in lateral view) 0.14; penis mean 0.65. Furca 0.45. Sagum 0.45. Vertical/Horizontal extension of uncus: forearm 0.16/0.025–0.22/0.04, humerulus 0.05/0.12–0.08/0.16, shoulder 0.1/0.05–0.18/0.06, lobe 0.21/0.05–0.24/0.06. Valve 0.6–0.65 with breadth 0.4–0.42; comb: breadth 0.15; first and second tooth: length (measured as in *dominica*) 0.028 and 0.028.

Cyclargus woodruffi Comstock-Huntington

(figs. WOO, pl. 3)

One male investigated: prep. 537, "Tortola, Virgin Isls., 2–IV–1925" *ex* coll. Amer. Mus. Nat. Hist., Mus. Comp. Zool.

Differing from the two preceding species in the following: ædeagus (similarly proportioned and shaped) distinctly larger; uncus lobe slightly longer; comb in actual breadth intermediate between *dominica* and *ammon* but appearing as broad as in *ammon* owing to the greater development of first and second teeth, the latter being intermediate in size between *dominica* and *ammon*, and the former about twice longer than in *dominica* and about one and one-half times longer than in *ammon*; the rest of the comb more finely serrated, with a greater number of teeth (21) than in the two preceding or in the next species.

Measurements (in mm.): ædeagus 0.83, suprazonal portion 0.28, subzonal 0.55 with breadth (in lateral view) 0.15; penis 0.7. Furca 0.42. Sagum 0.43. Vertical/Horizontal extension: forearm 0.2/0.04, humerulus 0.05/0.16, shoulder 0.13/0.06, uncus lobe 0.27/0.06. Valve 0.71 with breadth 0.42; comb 0.15; first and second teeth: length (measured as in *dominica* and *ammon*) 0.039 and 0.02.

Cyclargus thomasi Clench

(figs. TH, pl. 3)

Nine males and one female investigated (all in Mus. Comp. Zool.): *thomasi thomasi* Clench, holotype, prep. 520, "Arthur Town, Cat Isl., Bahamas, 16–VII–1935, *leg.* W. J. Clench"; paratype, prep. 492, *id.*; 516, 565, "Great Inagua, Bahamas, II–1934, *leg.* Armour Exp.; [holotype of "*Hemiargus bahamensis* Clench"] 490[1] "Crooked Isl., Bahamas, 1–III–1934, *id.*"; *thomasi noeli* Comstock-Huntington, paratype, prep. 502, "Haiti, *leg.* P. R. Uhler"; paratype, prep. 521, "San Domingo, Hispaniola" *ex* coll. Weeks; ♀ 531 "Beata Isl., *id.*, 17–I–1932" *leg.* Armour Exp.; *thomasi bethune-bakeri*, prep. 519, "Ft. Lauderdale, Florida, 23–VI–1933, *leg.* M. Bates"; 581, "Miami, *id.*, 8–15–IX," *ex* coll. Weeks.

Differing from the three other species in the following: ventral outline of suprazonal sheath in lateral view curiously concave above the zone and then angled, this being due to a higher (at two-thirds from the zone) and still more distally facing

[1] This is an aberrative male of *ssp. thomasi* showing a pretty contrast between the blurred and darkened disc of the underside of both wings and the strongly developed white cretules, while a very luminous scintilla rims and almost engulfs the Cu_1 præterminal mark. I doubt very much that this can be a subspecifically constant combination of characters on Crooked Isl.

vesical aperture; uncus a shade slighter than in *ammon*; comb greatly developed: first tooth hypertrophied, four times longer than in *dominica*, two and a half times longer than in *ammon* and twice longer than in *woodruffi*; second tooth about a third of the first (the rest as in *ammon* with same number of teeth as in that species and *dominica*).

Measurements (in mm.): ædeagus 0.68–0.72, suprazonal sheath 0.22–0.27, subzonal 0.45–0.46, with breadth (in lateral view) 0,11; penis mean 0.63. Furca mean 0.38. Sagum mean 0.43. Vertical/Horizontal extension of uncus: forearm 0.14/0.03–0.17/0.035, humerulus 0,045/0,12–0.06/0.14, shoulder 0.1/0.05–0.14/0.06, lobe 0.2/0.05–0.21/0.06. Valve 0.64–0.75 with breadth 0.35–0.4; comb; breadth 0.2; first and second tooth: length (measured as in the three other species) 0.07 (0.06–0.08) and 0.022 (0.02–0.028).

No subspecific structural distinctions are noticeable and anyway the wing-characters on which the subspecific names have been based must be revised as the comparisons were drawn between non-conspecific forms.

The catochrysopoid wing-characters of the *Hemiargus-Echinargus-Chilades-Cyclargus-Pseudochrysops* macroscopical group[1] in *Plebejinæ* are perhaps most beautifully expressed in the hindwing underside of *Cyclargus*. These combinational characters are in this genus: the conspicuously strong pigmentation of macules ScII, ScIII, Cu_2III,[2] 2AII, IIM and lateral macule in 4A (placed in corbic arrangement if viewed from base and strikingly resembling the African *Euchrysops* group) and of the Cu_1, Cu_2 and 1A præterminal marks (with scintillæ), in contrast to the extreme weakness of all other whole and split macules; (2) the ornamental concentration of an aurora in Cu_1 in contrast to the whiteness of all the other I intervals; (3) the subtriangular shape of these intervals and of the faint portions of I macules (both wings); (4) the rough quadrate shape of certain macules in the disc (both wings); (5) the strong development of halos, cretules and white scales intermixed with the ground

[1] The only other Plebejinæ having certain catochrysopoid wing-characters (of another type) are: the central Asiatic *Agrodiætus elvira* Eversmann (which departs in an extraordinary way from the pattern of its numerous congeners) and the nearctic alpine *Icaricia shasta* Edwards (two characters).

[2] Absent in *ammon ammon* as correctly noted by Comstock and Huntington 1943 *op. cit.* : 96 where, however, there is a clerical error in the notation of the position of the macule in question.

pigment; (6) the halo of I-M partly (posteriorly) fusing with that of M_2II.

Hemiargus Hübner [revised]

(figs. CE, RAM, HA, pl. 4; HAN, CER, pl. 7)

1818, Zuträge Exot. Schmett. 1: 10

Since *Papilio hanno* Stoll 1790, here found to be a different species from *Hesperia ceraunus* Fabricius 1793, is not mentioned in the Zuträge, Scudder's selection (1875, Proc. Amer. Acad. Arts Sci., Boston **10:** 186) and Hemming's confirmation (1934, Gen. names Holarctic Butt. **1:** 104) of the type as *hanno* Stoll cannot stand.

Type: *Hemiargus antibubastus* Hübner 1818 (=*Hesperia ceraunus* Fabricius 1793, subspecies).

Three known species:

ceraunus Fabricius, including *ceraunus ceraunus* Fabricius (*Hesperia ceraunus*, 1793, Ent. Syst. **3:** 333, "[W. Indies]"; *Lampides ceraunus*, Butler, 1869, Cat. diurn. Lep. Fabricius: 163, "Jamaica"; *Hemiargus hanno ceraunus*, Comstock-Huntington, 1943, Ann. New York Acad. Sci. **45:** 107–108), *ceraunus antibubastus* Hübner (*Hemiargus antibubastus*, 1818, *l.c.*, "Georgia"; *Lycœna hanno* Holland [*nec* Stoll] 1931, Butt. Book, pl. 32, fig. 3 ♂; *Hemiargus hanno antibubastus*, *auct.*), *ceraunus filenus* Poey (*Polyommatus filenus*, 1832, Centurie Lép. Cuba : [41–42], "Cuba," pl. [13], figs. ♀ ♂; *Hemiargus hanno filenus*, *auct.*), *ceraunus gyas* Edwards (*Lycœna gyas*, 1871, Trans. American Ent. Soc. **3:** 210–211, "Arizona"; Holland 1931 *op. cit.* pl. 47, figs. 3 ♂, 4 ♂ "typical"[1]; *Hemiargus gyas*, McDunnough, 1916, *in* Barnes-McDunnough, Contrib. Lep. N. America **3**:108–109; *Lycœna astragala* Wright, 1906, Butt. W. Coast: 232–233, "San Bernardino, California," fig. 401 ♂; *Lycœna florenciæ* Clémence, 1914, Ent. News **25**:28–29, Huachuca Mts., S. Arizona") and *ceraunus zachœina* Butler-Druce (*Lampides zachœina*, 1872, Cistula ent. **1** : 104–105, "Cartago, Costa Rica"; Butler, 1873, Lep. Exot. : 157, pl. 57, fig. 1 [poor]);

hanno Stoll, including *hanno hanno* Stoll (*Papilio hanno*,

[1] The locality label of the ♂ figured by Holland should be checked, as one is never safe with that author. McDunnough (1916 *l.c.*) was the first to point out that *gyas* could not be separated genitalically from *antibubastus*, and W. Comstock (1943:109) noted that the latter was structurally identical with *filenus*.

1790, *in* Cramer, suppl. : 170, "Surinam," pl. 39, figs. 2, 2B; *Hemiargus hanno hanno*, Comstock-Huntington, 1943, *op. cit.* : 104–106, "Paramaribo, Surinam"), *hanno bogotana* Draudt (1921, *in* Seitz, Macrolep. World **5:** 819, "Bogota, Colombia," pl. 144,k) and *hanno watsoni* Comstock-Huntington (1943, *op. cit.* : 106–107, "San Juan, Puerto Rico"; pl. 1, fig. 20 ♂ "Guayanilla, Puerto Rico");

ramon Dognin (*Lycæna*, 1887, Naturaliste **9:** 189–190, "Loja, Ecuador," fig. 4 ♂).

Generic Description

Ædeagus very long in relation to the other parts of the armature, with a neck-like suprazonal portion (as if the corresponding part in *Cyclargus* had been telescoped out). Suprazonal sheath in ventral (1), dorsal (2) and lateral (3) view: (1) slightly expanding at its termination where it is slightly notched, each of the resulting portions being armed with five or six ventro-laterally placed spinules; (2) revealing at more than half-way from the zone a narrow vesical fissure, the rather rough margins of which, just before expanding slightly to form the vesical opening proper (which is as long as the fissure), are somewhat drawn together and produce at this point two surculi, one on each side; (3) rather strongly incurved, with the vesical opening facing more or less distad and appearing still shorter than it is owing to the vesical slit not being seen from this angle, so that the eye mistakes the projection in profile of the paired surculi (directed dorsad and proximad) for the protruding nether "lip" of the opening.[1] Vesica, as seen laterally, pulvinate as in *Cyclargus*, but with smaller cornuti. Alulæ hardly, if at all, differentiated from the sagum, which is rudimentary, with no trace of teeth. Furca small, well adjusted to the ædeagus subzonally as in *Cyclargus*. Falx resembling *Cyclargus* but somewhat stronger and thicker. Uncus lobe evenly tapering to a blunt point. Valve small, shorter than the ædeagus, approaching the *Plebejinæ* shape-norm somewhat better than *Cyclargus* which it resembles only in the shoe-shaped mentum with no trace of a bullula and in the freedom of the rostellum; the latter, however, lacking any serration, with a bluntly tapering

[1] Moreover, from a certain angle, and especially in *hanno*, these surculi are easily mistaken by the eye for modified alulæ that would have been carried away from the zone by the generic distal extension of the ædeagus.

tip, and somewhat resembling in curvature (especially in the genotype) the kind of rostellum obtained among Old World genera only in *Chilades galba* Lederer (*sensu mihi*, i.e. including Eastern Mediterranean, Caspian, Arabian and Indian forms considered by authors as being distinct species, i.e. *galba* Lederer, *phiala* Grum Grshmailo, *ella* Butler and *contracta* Butler) and by an aberrant *Albulina* (*auct.*) species, *felicis* Oberthur, of the southern part of the Central Palæarctic region, in which species, however, the tip is toothed.

Female: henia shortish and curiously thick (with apparently reduced extensibility as in *Cyclargus* and thus unlike *Chilades*), strongly chitinized dorsally. Fibula resembling *Chilades*, pistol-shaped in profile (pointing distad), in ventral view seen to consist of a lamellate ventral piece and a horseshoe-shaped dorsal one.

Hemiargus ceraunus Fabricius

(figs. CE, pl. 4; CER, pl. 7)

Twenty-eight males and one female (all in the Mus. Comp. Zool. coll.) investigated: *ceraunus ceraunus* Fabricius, prep. 570 and 571, "Kingston, Jamaica, 6–XII–1871" *ex* coll. Scudder; *ceraunus ceraunus prox.*, prep. 499, "Ennery, Haiti, near 1,000 ft. alt., 16–VIII–1934, *leg.* M. Bates"; prep. 567, "Port au Prince, Haiti, up to 2,000 ft. alt., 2–IX–1934, *leg.* M. Bates"; and prep. 566 "Navassa Is., W. Indies, XII–1929, *leg.* W. J. Clench"; *ceraunus antibubastus* Hübner, prep. 525, "Egmont, Florida, 23–IV–1904," *ex* coll. Fall; prep. 580, "Florida," *ex* coll. Weeks, and prep. 582 ♀, "Ft. Lauderdale, Florida, 10–VII–1933, *leg.* M. Bates," prep. 339, "Valdosta, Georgia, 9–X–1943, *leg.* V. Nabokov"; and prep. 579, "So. Abington, Massachusetts, V–1880, *leg.* J. E. Bates" *ex* coll. Weeks; *ceraunus filenus* Poey, prep. 374, 497, 506, 515, and 561, "Sierra Maestra, E. Cuba, 1,000 ft. alt. . . . *leg.* O. Querci," *ex* coll. Weeks, taken "31–XI–1929," "29–V–1930," "22–VII–1930," "10–XI–1929" and "25–V–1930" respectively (individual 515 with unusually strong macules of series II underside); prep. 562, "Vinales, P. del Rio, Cuba, *leg.* L. de Jaume"; and prep. 563, "Central Soledad, Cuba, 27–VIII–1932, *leg.* B. B. Leavitt"; *ceraunus gyas* Edwards, prep. 523, "Baboquavaria Mts., Pima Co., Arizona, 15–30–VII–1903, *leg.* O. C. Poling," and prep. 574, "Cochise Co., Arizona," *ex* coll. Weeks; *ceraunus gyas prox.*,

prep. 400 and 524, "San Diego, California, 14–VIII–1908, *leg.* Geo. H. Field," *ex* coll. Fall; *ceraunus zachœina* Butler, prep. 513, "Punto Araras, Costa Rica, 11–XI–1871," *ex* coll. Scudder; prep. 510, "Acahuato, Michoacan, Mexico, 3,000 ft. alt., on *Cordia*, 19–VIII–1941, *leg.* R. Haag," and prep. 509, 572, and 613, "Apatzingan, Michoacan, Mexico, 1,200 ft. alt., moist jungle La Majada, at mud, 8–VIII–1941, *leg.* R. Haag"; other *ceraunus* forms: prep. 564, "Clarencetown, Long Is., Bahamas, II–1934, *leg.* Armour Exp."; prep. 504 "Vancouver Is." *ex* coll. Paine; prep. 575, "Colombia," *ex* coll. Paine.

Suprazonal portion of ædeagus in lateral view somewhat bottle-necked before the slight vesical expansion; longer than the subzonal portion; with five conspicuous spinules on each side: the first (counting proximad), at about 0.05 from tip (thus on the level of the apex of the ventral notch), 0.008 long, the next, immediately beneath, 0,018 (maximum), the third and fourth both 0,022 (max.), likewise placed together, at about 0.015 proximad from second and about the same distad from the fifth which is subequal to the latter. Vesical opening plus fissure somewhat less than half the suprazonal sheath. Surculi forming in profile a small sharp projection about 0.025 long. Furca about a fourth of the ædeagus, connected with the uneven but not actually serrated flaps of the indistinctly two-lobed sagum which rather loosely hangs from the zone ventrad. Falx with a thick blunt forearm and a high shoulder about half the forearm in height. Valve slightly shorter than the ædeagus, about twice as long as broad, resembling a *Chilades* valve in miniature but with a somewhat sharper mentum. Rostellum more or less distinctly angled about half-way down, with a plain, in some specimens slightly upturned tip (as in *Chilades galba*) descending in front of the mentum.

Female: ventral piece of fibula 0.13 long by 0.2 broad. Papillæ anales 0.35 by 0.3. Rods 0.75.

Measurements (in mm.): ædeagus 0.8–1.0, suprazonal portion 0.51–0.56 (mean 0.54), subzonal portion 0.30–0.44 (mean 0.40) with mean breadth 0.09 (in lateral view); penis mean 0.80; furca mean 0.24; sagum mean 0.3. Vertical/Horizontal extension of uncus: forearm 0.23/0.045–0.3/0.06 (mean 0.27/0.05), humerulus mean 0.075/0.15, shoulder mean 0.15/0.09, lobe 0.27/0.05 = 0.33/0.07 (mean 0.30/0.06). Valve: 0.65–0.80 (mean 0.74) with breadth 0.25–0.47 (mean 0.33).

The length of the suprazonal portion is very steady at just above 0.5; the subzonal one is more variable; it reaches 0.44 in most individuals from Jamaica and Mexico, as well as in one Californian specimen and in the only Colombian one. The falx and uncus lobe reach their maximum in one specimen from Cuba (Vinales) as well as in those from Florida and in the very large (length of forewing 13.2 mm.) specimen from Vancouver Island.[1] The valve is rather variable in size, as well as in the length/breadth ratio. The narrowest come from Jamaica, Cuba, and the S. E. States, the broadest from Haiti and Mexico (together with average individuals). The curious bloated appearance of some of the shorter Central American specimens (see pl. 4, CE. Mex., CE.C.R.) is due to the lower margin being strongly convex and there is also a certain fattening of the rostellum.

In result of the separation of *ceraunus* from *hanno* (see next species) a revision of the wing-characters of several races will be necessary, either because they have been described as separate species or because authors assigned them to the wrong species and thus did not compare them to the typical race of the right one. Incidentally, attention should be drawn to the fact that the retention of strong pigment not only in the Cu_1 præterminal mark but also in the M_3 one is a phenomenon that occurs, completely and incompletely, racially and individually, both in *ceraunus* and *hanno* (besides being typical in *ramon*), and no subspecies can be based on this character *alone*, since it can be developed in two different races of the same or different species.

Hemiargus hanno Stoll

(figs. HA, pl. 4; HAN, pl. 7)

Material: sixteen males and one female (all in the Mus. Comp. Zool. coll., except prep. 601), as follows: *hanno hanno* Stoll, neotype, prep. 601, "Paramaribo, Surinam, 18–IV–1927," *ex* coll. Cornell Univ., Am. Mus. Nat. Hist.; *hanno hanno prox.*, prep. 576, "Rio, Brazil, I–1875"; prep. 577 "São Paulo, Brazil,

[1] The occurrence of this species anywhere north of Arizona or the Carolinas (and even there the colonies would probably die out if not regularly replenished by the offspring of new arrivals) is due to direct spring immigration from the south in suitable seasons, which in its turn produces a more or less nomadic summer generation or generations. The same refers to *isola*.

V, *leg.* Bruno Pohl" and prep. 532, ♀, same; *hanno bogotana* Draudt, prep. 602, "Cota, n. Bogota, Colombia, 2,600 m. alt., 28–VIII–1938, *leg.* T. Hallinan" *ex* coll. Am. Mus. Nat. Hist.; *hanno watsoni* Comstock-Huntington, paratype, prep. 569, "San Juan, Puerto Rico, 11–14–II–1914"; other *hanno* forms: prep. 537[a], "Suapura, Venezuela, 27–VI–1899" *ex* coll. Weeks (strikingly resembling on the underside a specimen of *Chilades galba* Lederer from Daghestan, Russia); prep. 615, "Cariputo, Venezuela, 23–III–1942," *ex* coll. Am. Mus. Nat. Hist.; prep. 517, "Chulamani, Bolivia, 28–XI–1898" *ex* coll. Weeks; prep. 518, "Coroico, Bolivia, V–1899," *ex* coll. Weeks; prep. 600, "El Volcan Chiriqui, Panama, 3–III–1936, *leg.* F. E. Lutz," *ex* coll. Am. Mus. Nat. Hist.; prep. 512, "Taboga Is., Panama, 3–I–1935, *leg.* M. Bates"; prep. 511, "Barro Colorado, Panama, 2–II, *leg.* M. Bates" (strongly pigmented, with broad vadum occupying 20 scale lines in forewing); prep. 568, "Martinique"; prep. 498, "La Vista and vic., La Selle Range, Haiti, 5–7,000 ft. alt., 16–23–IX–1934, *leg.* M. Bates" (with a MS note by Mr. Harry Clench questioning its belonging to "*hanno*" *filenus*).

Differing from *ceraunus* as follows: ædeagus shorter; suprazonal portion shorter in relation to subzonal; both slightly thicker; suprazonal tapering more distinctly; broadening more strongly at vesical part; spinules smaller, even the median ones hardly reaching 0.007; surculi much more developed, reaching 0.06 in length; of a quite different shape, *i.e.*, strongly incurved, both quite distinct in profile; sagum consisting of a single short, leaf-like, incurved lobe of a rather thick texture, apparently formed by a fusion of the alulæ; falx and uncus lobe smaller; forearm somewhat more tapering; elbow rounder; shoulder considerably weaker (smaller, lower, rounder); valve smaller; rostellum longer (up to 0.5 long); different in shape — thinner, tentacle-like, sinuous, more or less strongly and evenly arched, without any break in its curve; mentum more prominent, shoe-shaped; lower margin of valve (processus inferior) very curiously chiselled: abruptly broadening (basad from mentum) midway, almost at right angles to the length of the valve, thus forming a kind of keel, its steep distal edge reaching a "vertical" length of 0,08 in some specimens.

Female: ventral lamella of fibula shorter (0.1) and broader (0.3) than in *ceraunus*.

Measurements (in mm.): ædeagus 0.70–0.95, suprazonal portion 0.36–0.52 (mean 0.48), subzonal portion 0.3–0.46 (mean 0.40), with mean breadth 0.11 (in lateral view), penis mean 0.73; furca mean 0.19; sagum mean 0.27. Vertical/Horizontal extension of uncus: forearm 0.15/0.022 to 0.24/0.045 (mean 0.2/0.035), humerulus mean 0.07/0.12, shoulder mean 0.1/0.06, lobe 0.19/0.045–0.26/0.06 (mean 0.24/0.05). Valve: 0.53–0.68 (mean 0.6) with breadth 0.24–0.36 (mean 0.3).

The length of the suprazonal portion of the ædeagus is very constantly around 0.5 in most of the sixteen males measured, gradually reaching 0.52 in a large Bolivian specimen (prep. 517) and in the Bogota one, but abruptly falling to 0.4 in the Cariputo specimen and to 0.36 in the (small) Martinique one. In the latter the suprazonal portion is shorter than the subzonal one (0.46), a ratio not met with in any other specimen; it would be interesting to see whether this applies to a special Martinique race, or is merely the result of irregular dwarfing in this particular individual. The subzonal portion is fairly constant at around 0.39, reaching 0.46 only in the above mentioned specimen and in the Surinam one, and falling to 0.3 in the Cariputo individual. The length of the forearm remains steadily at 0.21 in the majority of the specimens, rising to 0.22 in two (Surinam and Puerto Rico) and to 0.24 in one, but falling to 0.15 in the Cariputo specimen (where the whole armature is greatly reduced in size) and to 0.19 in a dwarf measuring 7 mm. from base of Cu to end of M_1 of forewing (Bolivia, prep. 518) as well as in another (smallish) individual from São Paulo. For the horizontal extension of the humerulus and for the height of the uncus lobe, 0.12 and 0.24, respectively, are the most frequently met measurements, with the humerulus steadier than the lobe which is much more sensitive in its reaction to the vertical growth or dwarfing of the forearm. The valve reaches 0.68 in my only Haitian specimen, but otherwise is very constant at close to 0.6, dwindling to 0.58, 0.56, and 0.53 in the small specimens from Martinique, Taboga, and Coroico.

Hemiargus ramon Dognin

(figs. RAM, pl. 4)

Two males investigated (both in Mus. Comp. Zool.): prep. 573, "Quayaquil, Ecuador, V–1924," *ex* coll. Weeks, and prep. 616, "San Rafael, Ecuador, VII–1919, *leg.* E. W. Rorer."

Suprazonal portion of ædeagus of the *ceraunus* type but considerably longer,[1] asparagus-like, of even breadth throughout after tapering at about one third from zone. Point of surculi in profile of the *ceraunus* type but still smaller (hardly 0.01). Ventral spinules very minute (less than 0.005). Sagum as in *hanno*. Falx of the *hanno* type but larger, heavier, with the shoulder still less pronounced. Valve of the *hanno* type, with deeply but rather roundly carved out lower margin and a somewhat straighter, slightly thicker rostellum.

Measurements: ædeagus 1.22–1.24, suprazonal portion 0.75, subzonal 0.47–0.49 with breadth 0.1–0.14; penis 1.05–1.1. Furca 0.23. Sagum lobe 0.21 with breadth 0.1. Vertical/Horizontal extension of uncus: forearm 0.25/0.055–0.29/0.06, humerulus 0.065/0.15–0.08/0.15, shoulder 0.1/0.07, lobe 0.21/0.07–0.23/0.06. Valve 0.62–0.65 with breadth 0.34–0.35.

Echinargus n.g.

(figs. ISO, N.SP, pl. 5, 7; *n.sp.*, pl. 8)

Type: *Lycæna isola* Reakirt 1866.

Two species known, one unnamed:

isola Reakirt (*Lycæna*, 1866, Proc. Acad. Nat. Sci. Philadelphia **1866**:332, "Vera Cruz, Mexico"; *Hemiargus isola*, Bethune-Baker, 1916, Ent. News **27**:450);

and a new species,[2] from Trinidad, British W. Indies.

Generic Description

Ædeagus shorter and weaker than in *Hemiargus*, intermediate in shape between *Hemiargus* (*hanno*) and *Cyclargus*; much plainer in structure, however, than in either, with very minute cornuti on the similarly shaped vesica. Suprazonal sheath shorter than the subzonal one, weakly notched ventrally, acuminate laterally, with high, rather distad facing vesical

[1] This is the longest ædeagus in *Plebejinæ* except *Aricia isaurica* Staudinger which is subequal, and *Icaricia icarioides* Boisduval which attains the enormous length of 1.75. Incidentally, in Chapman 1916, *l.c.*, the former species (pl. 29, fig. 2, ædeagus) is wrongly figured as *Albulina pheretes auct.* (*orbitulus* Prunner) and vice versa (pl. 30, fig. 4, ædeagus).

[2] Shortly after recognizing this as an undescribed species by studying the Thaxter pair (see below), I learnt from Mr. W. P. Comstock that he knew it already from specimens (one of which he gifted to this Museum) taken on the same island by Mr. E. I. Huntington, and was about to publish it. I refrain from using Comstock's MS. name so as not to interfere with his priority in case my paper appears before his.

opening and small alulæ at the zone. Furca larger or much larger than in *Hemiargus*. Sagum considerably more developed (and reaching in *isola* its maximum for the whole subfamily), consisting of two, ventrally scooped out or fully formed lobes aproning the ædeagus and armed with a set of teeth along the distal part or the whole of the margin. Forearm of falx very slightly curved and sharper than the straight blunt forearm of *Cyclargus* or *Hemiargus*, with a higher and more conical shoulder. Uncus lobe as in *Hemiargus* but slightly more excurved and tending to a hatchet shape under pressure. Valve of a normal subfamilial (fish-like) shape, allied to the *lajus* section in *Chilades*, with a tapering rostellum of the *Hemiargus ceraunus* type but differing from those genera by the presence of a bullula which is typical for holarctic *Plebejinæ* (and also exists in the next three neotropical genera to be discussed). Female: henia long and comparatively thin, thus again differing from *Hemiargus* in a normal "Old-World" direction.

Echinargus isola Reakert

(figs. 150, pl. 5, 7)

Seven males and one female investigated:

Prep. 540, "Tancitaro, Michoachan, Mexico, 6,000 ft., on *fæces*, 10–VII–1941, *leg.* R. Haag: 539 (*forma "nyagora* Boisduval") *id.*; 478, "Round Mt., Texas, X–1930," *ex* coll. Fall; ♀ 587, "Dallas, Texas, *leg.* Boll"; 500, 526, 534, "Texas"; 538, "Half Way House, Pike's Peak, Colorado, 9,000–10,000 ft., 16–18 VII–1902," *ex* coll. Weeks (? *ssp. alce* Edwards; see Field 1941, Kans. Univ. Sci. Bull. 26:347).

Ædeagus very poorly chitinised, very anemic looking when teased out of the prodigious structure of the sagum; just over two thirds of a mm. long, the suprazonal portion less than one third of the subzonal one with the vesical opening at two thirds from the zone. Furca extremely long,[1] almost reaching one mm.

[1] This is the only species of the nineteen discussed here that already had been (briefly) described genitalically: namely, Bethune Baker 1916, *l.c.*, refers to "a large toothed hood . . . [which] has its origin just above the very short furca." Evidently the greater part of the *very long* furca was screened from the observer by other parts of the armature. In this connection it should be noted that during the time the armatures are studied they should be kept in vials and if mounted at all (subsequently) the parts should be well separated, with the dorsum placed in ventral view. A slide of the whole armature in lateral view (or a photograph of such a preparation) is utterly useless.

and thus of a very holarctic aspect. Sagum hugely developed, consisting of two convex lobes, in ventral view resembling the parietal bones of a skull; about twice as long as broad, only slightly shorter than the prongs of the flexible furca embracing them: thus twice longer than the subzonal portion of the ædeagus which they envelop from the zone down, their strongly serrated edges meeting in front (e.g. ventrally) of the ædeagus and of an imaginary line prolonging it proximad; these teeth of uneven length but on the whole increasing in size proximad; up to 45 teeth along each margin, the first three or four (at the most distal point where the edges begin to meet) about 0.012 long, then ranging (in the same specimen) from 0.02 to 0.04 (and to 0.055 in some specimens) in an unequal sequence; finally reaching 0.1 at the proximal ends of the parting margins where they become clawlike, with clusters of additional spines on the præmarginal surface of the lobes. Shoulder of falx almost as high as the forearm which is about one third of the ædeagus. Valve twice longer than the ædeagus and more than three times as long as broad itself with a long tapering tail, a rather week hump, a small mentum and a curved rather than bent, thickish, gradually tapering rostellum about 0,2 long.

Female: henia beautifully developed with its distal half (about 0,6) strongly plated; fibula engulfed as it were in this chitinisation.

Measurements (in mm.): ædeagus 0.6–0.7 (mean 0.69), suprazonal portion 0.15–0.2 (mean 0.18), subzonal 0.45–0.52 (mean 0.49) with breadth (in lateral view) 0.08–0.09; penis mean 0.62. Furca mean 0.9. Sagum 0.85–0.96 (mean 0.93) with breadth 0.41–0.44 (mean 0.42). Vertical/Horizontal extension of uncus: forearm 0.2/0.03–0.22/0.035, humerulus 0.055/0.13–0.065/0.14, shoulder 0.18/0.05; lobe 0.25/0.08. Valve 1.28–1.31, with breadth 0.33–0.39.

Echinargus ***n.sp.***

(figs. N.SP, pl. 5, 7, 8)

Two males and one female investigated: prep. 578, "Port of Spain, Trinidad, XII–1912–V–1913, *leg.* R. Thaxter," Mus. Comp. Zool.; female, prep. 597 *id.*; prep. 614, "Chancellor Rd., Port of Spain, Trinidad, 21–31–III–1929, *leg.* E. I. Huntington," *ex* coll. Amer. Mus. Nat. Hist., Mus. Comp. Zool.

Ædeagus just over half a mm. in length, the suprazonal por-

tion about three fifths of the subzonal one, vesical opening at about two thirds from zone on the ventral side. Furca longer than the subzonal portion of the ædeagus and very thin. Sagum very remarkable: showing a transitional stage of development between *Hemiargus ceraunus* and *Echinargus isola*; each of its twin parts produced ventrad from the zone and embraced by the furca, in shape roughly resembling a high-shouldered falx the forearm of which (copied by the jutting lower portion of each lobe) would terminate in a process resembling a valval comb. For purposes of measurement this peculiar fig-leaf type of sagum may be imagined in the case of each lobe as a roughly equilateral triangle ZPD.[1] (where Z is the præzonal point, P the base of the penis and D the dentate end of each sagum lobe) with ZP (along the ædeagus) and PD (at an angle away from the ædeagus ventrad) and the imaginary line ZD connecting these points (and in position coinciding with the "filled out" ventral margin of each lobe in *isola*) each about 0.3–0.35 long. Actually a large portion (shaped rather like the falcal arch in high-shouldered falces) is left unfilled in the triangle ZPD so that each sagum lobe consists of an upper portion dorsally curving along the ædeagus, ventrally sinuous with a bulge in its outline, and roughly 0.35 long by 0.15 broad at that bulge, and of a lower portion, jutting in a ventral direction, 0.35 long along its straight basal side, 0.3 along its sinuous and oblique opposite margin and 0.04 broad at the beginning of its free part, then widening to 0.1, and at the very end narrowing again to form a spur 0.05 broad with four teeth 0.01 long. Falx and uncus lobe covered by the generic description and the measurements given below. Valve small but at least a fifth longer than the ædeagus, elongated, slightly more than twice as long as broad, with Bayard's angulation well pronounced. Rostellum bent towards the mentum, thin, tapering, about 0.11 long.

Female: henia extruding (semi-exerted) to a length of 0.25 by 0.12 broad medially in lateral view. Fibula consisting of two lamellate portions one longer by 0.04 than the other which is 0.17 long by 0.12 broad, of a suboval shape. Papillæ anales about 0.33 long by 0.42 broad, with rods 0.7 long.

Measurements (in mm.): ædeagus 0.56–0.58, suprazonal portion 0.2–0.21, subzonal 0.36–0.37 with breadth 0.1; penis 0.5. Furca 0.42–0.43. Sagum 0.35 (see description). Vertical/Hori-

[1] Which following the falcal simile would coincide with BHF (see pl. 1).

zontal extension of uncus: forearm 0.18/0.035–0.18/0.045, humerulus 0.04/0.12–0.045/0.14, shoulder 0.11/0.065–0.11/0.07, lobe 0.21/0.05. Valve 0.7 by 0.29–0.31 broad. Rostellum 0.11.

Alar characters, underside, ♀, (see plate 8): 0–150: number of concentric scale lines with common center for both wings (as also in *Cyclargus*). Veins ending at following lines: forewing Sc|65, R_1|85, R_2|100, R_3|120, R_4|140, M_1|145, M_2|145, M_3|143, Cu_1|137, Cu_2|128, 1A|124, 2A|118, hindwing Sc|78, R_s|94, M_1|108, M_2|110, M_3|110, Cu_1|108, Cu_2|100, 1A|94, 2A|85, 4A|40. The evenly rounded stretch of termen 94–108–110–110–108–100–94 is a rare character in *Plebejinæ* (also found in *Cyclargus*).

The following markings are represented: forewing, fairly broad terminal line, split macule I (with inner and outer cretules and uncolored interval) in cells R_4 to 1A, lateral macule in R_2, macule II (with broad halo) in R_4 to 1A, I discoidal R+M (with broad halo). Example of disposition (on interneural fold); in Cu_1: terminal line 133–136; outer cretule 127–133; præterminal mark (outer part of split macule I) 123–127; interval 116–123; semimacule (inner part of split macule I) 111–116; crescentic inner cretule 104–111 (thus the whole system of macule I extends from 104 to 133); outer part of halo of macule II 88–94; macule II 81–88; inner part of halo of macule II 76–81 (thus the whole system of macule II 76–94). Hindwing, fairly broad terminal line, split macule I (with crescentic inner and outer cretules; interval uncolored except in Cu_1) in cells Sc to 2A, poorly pigmented except the præterminal mark in Cu_1; macule II in same cells, macule III in Sc and Cu_2; I R+M and II M; lateral macule in 4A. Observations: præterminal marks in hindwing from Sc increasing tornad and together with the intervals tending to a triangular (basad pointed) shape, especially in M_2, M_3, weakly pigmented; then in Cu_1 greatly developed (20 scale lines), round, strongly pigmented ("black") with a distally placed band-like scintilla consisting of 52 scales and about a fifth the mark in extension (proximo distad), and a narrow crescentic interval faintly flushed with the auroral element; then in Cu_2 to 2A mark roundish, but small, decreasing tornad, weakly pigmented. Other catochrysopoid features, shared with *Cyclargus* and *Hemiargus*, can be easily seen from the figure.

Pseudolucia n.g.

(figs. CHI, COL, pl. 5)

Type: *Lycœna chilensis* Blanchard 1852.

Two species known:

chilensis Blanchard (*Lycœna*, 1852, *in* Gay, Hist. Chile, Zool. 7:37–38, "Coquimbo, Chile," pl. 3, figs. 4a ♂, b; *Scolitantides chilensis*, Butler, 1881, Trans. Ent. Soc. 1881:467; ?*Lycœna endymion*[1] Blanchard, 1852 *ibid.*:37 "Coquimbo, Chile," pl. 3, fig. 3a ♂, b; *Polyommatus atahualpa* Wallengren, 1860, Wien. ent. Monatschr. 4:37, "Valparaiso, Chile").

collina Philippi (*Lycœna*, 1860, Linn. Ent. 14:270–271 "Santiago, Chile"; *Scolitantides*[2] *collina*, Butler, 1881 l.c.; *Lycœna lyrnessa* Hewitson, 1874, Ent. Month. Mag. 11:107 "Chile").

Generic Description

Ædeagus thick-set, with strong fat tabs and alulæ, the latter very homogeneous with the subzonal sheath, sepaloid, arched and raised (as in several suprazonally short palæarctic genera e.g. *Agrodiætus*), the zone dipping medially (ventrally slightly more so than dorsally) and coinciding with the beginning of the vesical opening on the dorsal side. Suprazonal portion, as measured from that medial point ventrally, extremely short, about one third the length of the subzonal one (and still shorter if measured from the apices of the "shrugged" alulæ), thus shorter than in any other species restricted to the New World. The short shield of the (ventral) suprazonal sheath deltoid in ventral aspect, acuminate in lateral view and quite straight i.e. lacking the slight excurvation noticeable in *Hemiargus*, *Cyclargus* etc.; exceeding in length the plain unarmed vesical tip of the penis (which seems sunken between the alulæ). Subzonal sheath thickly lining the penis, curiously shagreened ventrally. Furca strongly developed, its tips connected with the sagum. The latter in shape and position of the *Echinargus isola* type, but considerably smaller (in relation to the ædeagus), its two lobes reaching from the level of the alulæ (to which they are

[1] Rechristened "*sibylla*" by Kirby (1871, Cat. Diurn. Lepid.: 377) who wrongly thought Blanchard's name clashed with *Papilio endymion* [Schiff] = *Meleageria meleager* Esper.

[2] The genus *Scolitantides* Hübner, of which *orion* Pallas is the type, belongs to the *Glaucopsychinæ*. By an amusing coincidence Butler placed almost correctly in that genus the species *plumbea* described *ibid.*

attached) to the level of the base of the penis proper and almost as broad as long; meeting in front (i.e. ventrally) of the ædeagus at about one third of the subzonal portion from the zone, overlapping for a short stretch, then parting again; these front edges coarsely serrated, and the whole præmarginal portion of each lobe strengthened ventrally by an additional sharply localized granulation of the chitinous surface (similar to the shagreened ventrum of the ædeagus as seen in the V-shaped anterior parting of the lobes), a character not found elsewhere in the subfamily. Uncus small, resembling *Pseudothecla* and also the unique plebejinoid uncus [1] of the holotropical *Zizula gaika* Trimen (*Lycæna cyna* Edwards) in *Brephidinæ*. Falx still more curved than in *Echinargus*, differing from *Hemiargus* as a beckoning index does from a warning one; the whole outline from point of forearm to base of humerulus evenly rounded, with a gently sloping shoulder, thus quite different from the "cameloid" falces of the three preceding genera. Uncus lobe still more tending to a hatchet shape than in *Echinargus* (and thus resembling *Eumedonia*). Valve of a typical holarctic shape, with bullula; elongated, nicely angled at Bayard's point, rather exactly three times as long as broad and at least twice longer than the ædeagus, with a sparsely serrated rostellum.

Female: henia long and thin, with a plate-like chitinisation at the tip.

Pseudolucia chilensis Blanchard

(figs. CHI, pl. 5)

Three males and one female (all ex coll. Weeks, Mus. Comp. Zool.) investigated: prep. 619, "Central Chile, 1882–1885, *leg* H. B. James"; 485, 534, "Penco, Chile"; ♀ 533, *id.*

Rostellum about 0.2 long by 0.03 broad (at curve), incurved as in *Echinargus isola* but serrated *i.e.* ending in a beak-like tip, its inner margin concave (fitting the upper, convex, margin of the mentum in situ), its outer (distad facing) edge below the curve sparsely toothed: four teeth in all counting the "heel" of the abrupt curvature as first, the two next slightly larger and slightly incurved projections as second and third, and the beak of the rostellum as fourth. Other male characters covered by

[1] This and the *Catochrysopinæ*-like features of the *Parachilades* (and less distinctly-*Chilades*) falx constitute the only two links between the *Plebejinæ* and other subfamilies.

the generic description and the specific measurements given below.

Female: henia found extruding at a length of 0.45 from tip of body; ostium strengthened by a post-vaginal lamella attaining a dorsal length of 0.25 and a lateral one of 0.38 (basad). Papillæ anales: length about 0.45 by 0.4 broad. Rods comparatively short, 0.7.

Measurements (in mm.): ædeagus mean 0.65, suprazonal portion (see also generic description) 0.15–0.18 (mean 0.16), subzonal 0.48–0.53 (mean 0.5), breadth (in lateral view) 0.12; penis 0.56. Furca 0.7–0.9. Sagum (mean) length of lobe 0.48 by 0.42 broad; breadth of granulation 0.1; average length of teeth 0.03. Vertical/Horizontal extension of uncus: forearm 0.21/0.04–0.25/0.05, humerulus 0.05/0.21–0.06/0.21, shoulder 0.11/0.12, lobe 0.2/0.07–0.23/0.07. Valve 1,3–1,4 with breadth 0.45–0.48: teeth (first three measured from tip to a level prolonging basad the anterior edge of each next): first 0.005, second 0.006, third 0.003, fourth (to junction with third) 0.04.

Pseudolucia collina Philippi

(figs. COL, pl. 5)

Prep. 536, "Penco, Chile," *ex* coll. Weeks, Mus. Comp. Zool.; female 591, id.

Differing from *chilensis* in greatly reduced size (except as regards the height of the shoulder, as will be seen by referring to the measurements given below) and in the presence of an additional strip of shagreened chitinisation running along the outer margin of each sagum lobe and proximad converging, but not actually fusing, with the similar granulation along the serrated inner edge. Rostellum thin, whip-like, very similar (in miniature) to the *lajus* group in *Chilades*, very weakly curved, however, and only slightly exceeding the mentum in length (*in situ* resting upon the bullula), about 0.02 broad, not curving and broadening at the tip (as it does in *chilensis*) except for a slight rosette-like expansion due to four somewhat up-turned teeth, the first about 0.01 long, the two next gradually diminishing, the last barely indicated.[1]

Female: henia found jutting to a length of 1 mm. (by about

[1] I do not think I have failed to unfold the tip properly, but still its serration should be checked on more material.

0.07 broad) from the tip of the body. Lamella 0.2 long laterally, twice shorter dorsally.

Measurements (in mm.): ædeagus 0.43, suprazonal portion 0.11, subzonal 0.32 with breadth (in lateral view) 0.06; penis 0.4, furca 0.5, sagum about 0.3 by 0.2. Breadth of inner granulation 0.9, with average length of teeth 0.01; breadth of outer granulation about 0.4. Vertical/Horizontal extension of uncus: forearm 0.14/0.03, humerulus 0.045/0.16, shoulder 0.11/0.09, lobe 0.2/0.06. Valve 1 with breadth 0.33; teeth 0.01 and smaller.

The high development of the auroral element in the ground of *chilensis* and *collina* is approached among the *Plebejinæ* only by the upperside of the Sonoran *Plebulina emigdionis* and by the intense coloration of the forewing underside in certain individuals of the Spanish *Aricia idas* Rambur (rechristened at one time "*ramburi*" by Verity).[1] The upperside of the females oddly recalls certain Australian Lycænids belonging to a widely different subfamily.

The underside maculation in *chilensis* is of a dispositional type frequently met with in *Plebejinæ* (and *Glaucopsychinæ*); the tendency on the part of the II macules in forewing to assume a very distal position (quite normal of course in the case of Cu_2+1A) as well as the rather proximal ("glaucopsychoid") position of R_sII in hindwing and the weak pigmentation of the I (split) macules, with an aurora visible only in Cu_1 of hindwing (in some specimens but absent in the female type), occur in several palæarctic and nearctic species of both subfamilies. The insulæ and outer cretules are conspicuous on the upperside of the male and are still more conspicuous in Blanchard's figure of *endymion* which on the whole differs from *chilensis* only in being rather thoroughly dusted with blue structural scales (that are sparsely represented basally and along the hindwing dorsum in one of my males of *chilensis*). In my specimens of *collina* (a much smaller species) the distal position of the II macules R_4 to Cu_1 is still better marked and I RM (weak in *chilensis*) is quite absent — a rather unusual character. In the hindwing, however, where II macule R_s is as proximal as in *chilensis* the resemblance to the latter species abruptly stops at that interspace: the posterior rest of the wing produces in con-

[1] One would like to suggest that in the future no such renaming, however necessary, should be valid unless the author of the new name redescribes the species or subspecies and selects a holotype.

trast to the rather *Plebejus sæpiolus*-like wing of *chilensis* a remarkable homoptic or mimetic resemblance to *Itylos* and especially to *Parachilades* owing to a combination of seven characters: 1. enlarged, more or less cordate shape of median and posterior II macules; 2. their transverse development and connection; 3. the oblique line into which II macules M_2 to 2A fall; 4. the blurred pigmentation; 5. the weakness of the I macule system; 6. the fusion of distal parts of halos with proximal cretules; and 7. the great development of coarse greyish white scales.

Scolitantides plumbea Butler 1881 (Trans. Ent. Soc. **1881**:486, "Chile") which is possibly the same as *Lycæna patago* Mabille 1889 (Nouv. Arch. Mus. Paris **1**:143–144 "Punta-Arena" pl. 10, fig. 1 ♂, 2) belongs to a different subfamily, being structurally the only representative of *Glaucopsychinæ* in S. America. *Scolitantides andina* Calvert 1894 (An. Univ. Chile **34**:832, "Condes above Santiago"; Elwes 1903 Trans. Ent. Soc. London **1903**:288–289) may prove to be a synonym of *plumbea* too.

Paralycæides n.g.

(figs. INC, pl. 6)

Type and only species known: *Itylos inconspicua* Draudt 1921, (*in* Seitz, Macrolep. World **5**:822, "Cuzco, Peru," pl. 144, m).

One male investigated: prep. 607 "Cuzco, Peru, 3500 m. alt., *leg.* Fassl," *ex* coll. W. P. Comstock, [*ex* coll. Staudinger-Bang Haas, "*vapa* Stgr"], Amer. Mus. Nat. Hist.

Extremely close to *Lycæides*, in the falx, furca and valve, and considered here as retaining an ancestral aspect of that genus. Ædeagus resembling *Pseudothecla*, thickish subzonally, very slightly incurved, just above 0.8 long; differing from *Lycæides* in the suprazonal portion being twice shorter than the subzonal one and in the higher (at about 0.1 above zone), and thus shorter, vesical opening (the lower point of which is at the zone in *Lycæides*). Vesica unarmed; suprazonal sheath tapering to a point ventrally. Furca very large, equal in length to the ædeagus, larger than in *Lycæides* (especially in relation to the other parts of the armature, less so in absolute size). No definite sagum but traces of a membrane between furca and subzonal sheath. Falx of the "plain type" with an outline nicely

rounded throughout, remarkably resembling *Lycœides argyrognomon* Bergstrasser (Tutt) in miniature, less distinctly hooked at the tip; distance between point of forearm (F) and posterior point of shoulder (U) equal to that between the latter point and the tip of the uncus lobe (in ventral view); forearm short, shorter than the humerulus, the latter medially not thicker than the former, then very gradually thickening to form a low sloping shoulder with a rather ill-defined basal point. Uncus lobe resembling *Hemiargus, i.e.*, poorly developed; thus smaller, narrower and slightly more excurved than in *Lycœides*; in height (length) when measured in the same way as the rest of the genera here treated (*i.e.*, from its tip to the basal point of the humerulus) equal to the humerulus but if measured according to the method adopted for *Lycœides* (*i.e.*, from its tip to the posterior point of the shoulder) considerably less than the humerulus (HU) and somewhat less than the forearm (FH). Valve of the *Lycœides* (and *Freyeria*) type, smallish as compared to *Lycœides*, one and a half times longer than the ædeagus, about twice as long as broad; rostellum narrower in relation to the valve than in *Lycœides*, not exceeding the mentum in length, slightly and evenly expanding at the tip to form a comb consisting of a dozen teeth, each about 0,0065 in length, i.e. longer than in *Freyeria putli* Kollar [Moore] (0.0025), shorter than in average *Lycœides* (0.009), and directed as in those genera (as well as in *Cyclargus*) at right angles to the transverse axis of the rostellum.

Measurements (in mm.): ædeagus 0.82; suprazonal portion 0.27; subzonal 0.55 with breadth 0.15 (in semilateral view); penis 0.66. Furca 0.83. Vertical/Horizontal extension of uncus: forearm 0.22/0.05, humerulus 0.05/0.24, shoulder 0.11/0.15, lobe 0.24/0.075. When the uncus is measured according to the method used for *Lycœides* (see pl. 1, fig. 3, pl. 6, INC 2, and 1944, Psyche **51**:108–111, fig. 1) the triangle FHU gives $0.22+0.24+0.17=0.63$. These figures come rather close to the dimensions ($0.25+0.22+0.22=0.69$) of the hypothetical ancestor of *Lycœides* as worked out (1944, l.c.) prior to the discovery of the structure of *inconspicua*. Valve 1.2 with breadth 0.53; comb 0.061 broad.

In regard to macroscopical characters it may be briefly noted that the wing-shape recalls that of small arctic or high alpine forms of *Lycœides* while the pattern of the underside (very

proximal position of II macule Cu_2 + 1A in forewing and II macule M_3 in hindwing, poverty of pigmentation of macules, strong development of halos and other colorless scales) belongs to the same phase, as traversed by the structurally very different genus *Itylos* (*s.s.*).

Itylos Draudt [revised]

(figs. MOZ, RUB, PAC, KOA, pl. 6; MOZ, KOA, pl. 7)

At the end of a jumble of species and forms belonging really to several genera and subfamilies but all crammed into "genus *Lycæna* F, subgenus *Rusticus* Hbn" (whatever that means), Draudt (1921, *in* Seitz, Macrolep. World **5**: 818) said of *Lycæna ruberrothei* Weeks ["English" text]: "Perhaps better to be placed to *Itylos* beside *moza* and *inconspicua*." This is the first time the genus *Itylos* is "indicated." A few pages further (: 821) *Itylos* Draudt was superficially described and made to include *pelorias* Weymer, *pacis* [Staudinger in commerce] Draudt, *koa* Druce, *vapa* Staudinger [*sp. incert.*], *ludicra* Weymer [*id.*], *moza* Staudinger, *inconspicua* Draudt [*recte Paralycæides sp., supra*], *titicaca* Weymer [*recte Parachilades sp., supra*] and *speciosa* Staudinger [*id.*]. Regarding the two last, however, Draudt said (: 822) that they belonged to "a somewhat deviating group." Under the circumstances, *i.e.*, since *speciosa* Staudinger [=*titicaca* Weymer] is not mentioned in the original list of *Itylos* species (*ruberrothei* Weeks [*fortas.*], *moza* Staudinger and *inconspicua* Draudt [*nom. nud.* at the time]) and is only doubtfully assigned to it when the genus is more fully discussed subsequently, Hemming's selection of *speciosa* Standinger as the type of *Itylos* (1929, Ann. Mag. Nat. Hist. **3**: 240) cannot stand.

Type: *Cupido moza* Staudinger 1894.

Four species known: [1]

moza Staudinger (*Cupido*, 1894, Iris 7: 79–80, "Cocapata and Huallatani, Bolivia"; *Lycæna*, *ibid.* pl. 2, fig. 5 ♀; *Itylos moza*, Draudt 1921, *op. cit.*:818 *et*:821; *Lycæna babhru* Weeks, 1901, Trans. Am. Ent. Soc. **27**: 357, "Sicasica, Bolivia"; 1905, Unfig. Lep. : 98, pl. 43, fig. 1 [♀]);

ruberrothei Weeks (*Lycæna*, 1902, Ent. News **12**: 104 "Sicasica, Bolivia," 1905 *op. cit.* : 99, pl. 43, fig. 2 [♂]; *Itylos*?, Draudt 1921, *op. cit.* : 818);

[1] Listed in systematic sequence.

pacis Draudt (*Itylos*, 1921, *op. cit.* : 821, "Cuzco, Peru," pl. 144, 1, *pacis* ♂ ♀ ; ?*Lycæna pelorias* Weymer 1890, *in* Reiss *et* Stübel, Reisen in Sud-America, Lepidoptera : 121–122 "Sajama, Bolivia," pl. 4, fig. 2 ♂);

koa Druce (*Lycæna*, 1876, Proc. Zool. Soc. London, **1876 :** 239–240, "Pozzuzo, Peru," pl. 18, fig. 7 [♂]; ?Weymer, 1890, *op. cit.*: 49 "Antisana, Ecuador"; *Itylos*, Draudt, 1921, *op. cit.* : 821 pl. 144, m; [see also "*Lycæna koa*," Dyar, 1913, Proc. United States Natul. Mus. **45** : 638, who suggests seasonal dimorphism in the tone and density of the blue overlay in Peruvian males].

My study of the bibliography has been very superficial and my material too scanty for a satisfactory revision of these little known species. *Lycæna ludicra* Weymer 1890 (*op. cit.* : 122, "Tacora, Bolivia," pl. 4, fig. 3 ♂) may be a form of *Itylos moza*, or an allied species, with well developed cyanic overlay, and *Itylos grata* Kohler 1934 (Rev. Soc. ent. Argentina **6** : 38–39 "Las Lajas, Argentina," text fig. [poor phot.] ♂) is apparently close to *pacis* Weymer. *Cupido vapa* Staudinger 1894 (Iris **7** : 79, "Huallatani; Cocapata, Bolivia"; *Lycæna vapa*, *ibid.* pl. 2, fig. 4 ♂) may turn out to belong to *Itylos*, and the same may be said of *Lycæna martha* Dognin 1887 (Le Naturaliste **9** : 190, "Loja, Ecuador"), which, judging by the woodcut (l.c. fig. 5 ♂ ♀) combines *Hemiargus* and *Itylos* wing characters and very possibly is a form of *koa* (some specimens of which have a well formed, "black," scintillated præterminal mark in Cu_1) with strongly developed ornamentation of the catochrysopoid type.

Generic Description

A very holarctic looking genus. Ædeagus acuminate, slightly incurved, in structure and shape closely allied to *Icaricia*, *Aricia*, and *Lycœides*. Suprazonal portion subequal to the subzonal one; suprazonal sheath in ventral view rather narrow above the zone, then slightly broadening, then tapering to a sharp point, and (in side view) laterally enveloping the vesica only immediately above the zone, then gradually turning into a strictly ventral shield. Vesical opening on the dorsal side beginning immediately above the zone, vesica plain, weakly convex, about as long as the subzonal sheath. Alulæ small. Furca well developed. Sagum absent. Falx resembling an enlarged edition of

Cyclargus; somewhat allied to *Aricia* but well formed, with a steeper and narrower shoulder. Forearm straight, tapering to a blunt point, falcal arch narrow, shoulder high and conical though not as high in relation to the falx as it is in *Echinargus*. Uncus lobe with *Albulina* affinities, larger than in all preceding groups considerably higher than the forearm. Structure of tegumen at its junction with the uncus more elaborate, than in the preceding genera, of a common holarctic type (*Albulina*, *Plebulina*, etc.). Valve likewise representing the holarctic norm, longer than the ædeagus, with a well developed bullula. Rostellum, broader than in *Aricia*, serrated, exceeding the mentum in length, differing from *Paralycœides* in the latter character as well as in the receding margin of the comb, the sharp regular teeth of which are directed downward.

Papillæ anales with comparatively short rods. Henia well developed, with an oval fibula (*koa*) somewhat resembling *Aricia*.

Itylos moza Staudinger

(figs. MOZ, pl. 6, 7)

One male investigated: prep. 606, "Bolivia" *ex* coll. Huntington [*ex* coll. Staudinger-Bang Haas], Am. Mus. Nat. Hist., and one female: prep. 528 (*Lycœna babhru* Weeks, holotype), "Sicasica, Bolivia, 1–X–1899," *ex* coll. Weeks, Mus. Comp. Zool.

Ædeagus 1 mm. long with the suprazonal portion slightly shorter (by about 0.1) than the subzonal one. Furca about equal in length to the penis. Forearm a third of the length of the ædeagus, about ten times as long as broad, thus rather thin; humerulus thick, about a third of the forearm in height, and rising to double of that at the shoulder; uncus lobe very slightly excurved, as long as the suprazonal portion of the penis, less than a fourth of that broad, somewhat expanding above the level measured, then gradually tapering to a rather well accused point. Valve large, about one and a half times longer than the ædeagus when measured from the base to the end of the rostellum and less than half as broad as long, with the hump at about two thirds of the length of the upper process from the base of the valve.

Measurements (in mm.): ædeagus 1, suprazonal portion 0.44, subzonal 0.56 with breadth (lateral view) 0.11; penis 0.94. Furca 0.93. Vertical/Horizontal extension of uncus (ventral

view): forearm 0.34/0.03, humerulus 0.09/0.2, shoulder 0.17/0.06, lobe 0.44/0.1. Valve 1.35 (to comb 1.55) with breadth 0.59; average length of teeth 0.01.

Itylos ruberrothei Weeks

(figs. RUB, pl. 6)

Two males investigated (Mus. Comp. Zool.): holotype, prep. 527, "Sicasica, Bolivia, 1–X–1899" (left forewing missing), and paratype, prep. 486, "Alezum, Bolivia, 8–VIII–1899," *ex* coll. Weeks.

Identical in structural shape with *moza*,[1] differing from it only in slightly reduced size (cp. measurements) of ædeagus, furca and uncus, and narrower (cp. to length) valve. Valve variable in length, reduced in the holotype, but equal to *moza* in the other individual.

Measurements (in mm.) [when different the holotype is quoted first]: ædeagus 0.9, suprazonal portion 0.4; subzonal 0.5 with breadth in lateral view 0.1, in ventral 0.08; penis 0.8. Furca (holotype) 0.7. Vertical/Horizontal extension of uncus: forearm 0.24/0.03 and 0.29/0.05, humerulus 0.07/0.12 and 0.07/0.17, shoulder 0.13/0.055 and 0.14/0.05, lobe 0.37/0.8 and 0.4/0.09. Valve 1.14 (to comb 1.24) and 1.35 (to comb 1.55) with breadth 0.41 and 0.5. Average length of teeth 0.01.

Itylos pacis Draudt

(fig. PAC, pl. 6)

One male investigated: prep. 609 "Cuzco, Peru, 3500 m. alt., *leg.* Fassl," *ex* coll. W. P. Comstock [*ex* coll. Staudinger-Bang Haas], Am. Mus. Nat. Hist.

Differing from *moza* and *ruberrothei* in the following characters: somewhat thicker forearm, smaller and shorter valve,

[1] Quite possibly more material would show that *ruberrothei* is but a form (individual, altitudinal, or microlocal) of *moza*, similar variations in structural size occurring in other alpine species (e.g., *Agriades glandon*). I have assigned the female specimen (described as *babhru*) to *moza* on macroscopical grounds, the difference between the two consisting solely in *ruberrothei* being less robust in wing shape and less pigmented than *moza* (with otherwise identical underside markings, the presence of which on the hindwing of *ruberrothei* may be easily discerned by means of lens, but has been overlooked both by the describer and artist). Staudinger mentions some very weakly marked specimens in his series of *moza*.

rather medial position of hump, shorter (comparatively to mentum) rostellem and conspicuously longer teeth.

Measurements (in mm.): ædeagus, 0.95, suprazonal portion 0.45, subzonal 0.5 with breadth (lateral view) 0.12; penis 0.85. Furca 0.7. Vertical/Horizontal extension of uncus: forearm 0.29/0.05, humerulus 0.06/0.2, shoulder 0.15/0.06, lobe 0.4/0.9. Valve 1.1 (to comb 1.2) with breadth 0.44; average length of teeth 0.017.

Itylos koa Druce

(fig. KOA, pl. 6, 7)

Two males and one female investigated (Mus. Comp. Zool.): prep. 592, 595 and 593 female, "Puno, Peru, 12,500 ft. alt., 1–XI–1898" *ex* coll. Weeks.

Separated in uncus and valve from the precedent structures by a wider hiatus than that existing between *moza* and *ruberrothei* on one hand and *pacis* on the other. Ædeagus slightly shorter and thinner than in *pacis*, furca slightly longer. Forearm shorter, rather thicker at its base, then tapering, shoulder smaller, uncus lobe about six times as long as broad, much narrower throughout than in the other species. Valve smaller, rather proximally humped, hardly more than half as long as broad, only slightly longer than the ædeagus, with a correspondingly reduced comb, very minutely serrated, the teeth a third shorter than in *ruberrothei*.

Measurements (in mm.) [when different, 592 quoted first]: ædeagus 0.84 and 0.8, suprazonal portion 0.42 and 0.4, subzonal portion 0.42 and 0.4 with breadth (lateral view) 0.08; penis 0.8 and 0.75. Furca 0.76. Vertical/Horizontal of uncus: forearm 0.23/0.05 and 0.25/0.05, humerulus 0.08/0.13 and 0.1/0.17, shoulder 0.13/0.05 and 0.17/0.06, lobe 0.31/0.06 and 0.3/0.055. Valve 0.9 (to comb 1) with breadth 0.41 and 0.42; average length of teeth 0.004.

The "vitta" of British authors is a certain combinational pattern element occurring on the hindwing underside of a number of Palæarctic *Plebejinæ* (and especially conspicuous in certain *Agrodiætus* species). It is made up of halo and cretule fusions and can be divided into four phases of development: 1. halo M_2 (its posterior distal part) and cretule M_2 fuse in the posterior part of the cell, *i.e.*, below the interneural fold in M_2, the resulting white streak occupying the whole space between the fold

and vein M_3; 2. a similar somewhat weaker fusion is added (not occurring alone) in the anterior part of cell M_3 and blends along vein M_3 with the fusion in the posterior part of cell M_2; 3. halo IM (lower part of first discoidal) fuses with halo M_2 which is fused with cretule M_2; 4. halo IIM is also involved, this producing a white comet tail traversing most of the wing, "splitting" it longitudinally and widening distally (owing to fusion 2). When, as often happens in *Agrodiætus* the rest of the halos and cretules are reduced while the median macules themselves are "dissolved," so to speak, in the vitta, the effect is very striking. In *Itylos* the vitta effect is produced quite differently and may be termed a *pseudovitta.* At its full development it is formed by the fusion of the halos and cretules in M_3, CU_1, Cu_2, and IA, and would not be distinguishable from similarly formed blendings in *Lycœides, Cyclargus,* etc., had not the following three factors been present: 1. owing to the very proximal ("lagging") position of second macule M_3 the fusion is lengthened in that cell; 2. together with the shorter fusions in the cubital cells it forms an elongated shiny white mark subparallel to the costa; 3. this blending is especially conspicuous because absent in M_2 and M_1.

Conclusions

The following general remarks may be added. Of the nine neotropical genera none occur elsewhere. Three, namely *Parachilades, Paralycœides* and *Itylos,* have retained in the Andes (whither they brought them) structural shapes closely similar to such structures from which *Chilades, Lycœides* and *Aricia,* respectively, can be easily imagined to have been derived in their Old World homes. Three, namely *Pseudochrysops, Hemiargus* and *Echinargus* reveal certain characters of the palæotropical *Freyeria* (the first) and *Chilades,* but have become strongly differentiated in the neotropics. Still more remote is the relationship between *Cyclargus, Pseudothecla* and *Pseudolucia* on one side and Old World forms on the other. It is to be noted however that *Cyclargus* and *Hemiargus* are allied to *Aricia* and *Itylos* in the falx. The general *Hemiargus – Echinargus – Cyclargus* type of ædeagus is not found in the Old World and apparently represents a very ancient type retained and developed in the neotropics, but extinct or unrecognizably altered elsewhere.

One can assume, I think, that there was a certain point in time when both Americas were entirely devoid of *Plebejinæ* but were on the very eve of receiving an invasion of them from Asia where they had been already evolved. Going back still further, a modern taxonomist straddling a Wellsian time machine with the purpose of exploring the Cenozoic era in a "downward" direction would reach a point — presumably in the early Miocene — where he still might find Asiatic butterflies classifiable on modern structural grounds as Lycænids, but would not be able to discover among them anything definitely referable to the structural group he now diagnoses as *Plebejinæ*. On his return journey, however, he would notice at some point a confuse adumbration, then a tentative "fade-in" of familiar shapes (among other, gradually vanishing ones) and at last would find *Chilades*-like and *Aricia*-like and *Lycœides*-like structures in the Palæarctic region.

It is impossible to imagine the exact routes these forms took to reach Chile, and I have no wish to speculate on the details of their progress, beyond suggesting that throughout the evolution of *Lycœnidæ* no two species ever became differentiated from each other at the same time in the same habitat (*sensu stricto*), and that the arrival of *Plebejinæ* in South America preceded the arrival in North America (and differentiation from Old World ancestors) of the genera *Icaricia* and *Plebulina* (and of the species *Plebejus sœpiolus*) while the latter event in its turn preceded the invasion of North America by holarctic species which came in the following sequence: *Lycœides argyrognomon* (subsequently split), *Agriades glandon*, *Vacciniina optilete*. It is to be noted that only those *Plebejinæ* which breed freely in the far north of Eurasia (besides enjoying an enormous distribution in other, mainly alpine regions) are common to both Eurasia and America.

In regard to certain Lycænids of other subfamilies, such as the holotropical *Zizula gaika* Trimen and the South African and American genus *Brephidium*, the difficulty of making them take the Bering Strait route is very great, but in the case of *Plebejinæ*, the discontinuity in distribution is not so disconcerting, and I find it easier to give a friendly little push to some of the forms and hang my distributional horseshoes on the nail of Nome rather than postulate transoceanic land-bridges in other parts of the world.

The majority of neotropical *Plebejinæ* possess a sagum or rudiments of one. It is completely absent only in *Itylos* as it is absent in all palæarctic, nearctic and palæotropical species. This structure can be loosely defined as a fultura superior in relation to the furca (fultura inferior), but its function, if any, is obscure. One is inclined to assume that at the time of the invasion of the neotropical region from the north there existed Eurasian forms with rudiments of a sagum (possibly allied at that stage to the anellus now possessed by the *Catochrysopinæ* and other subfamilies) which in the subsequent flurry of hectic central palæarctic evolution was lost (and had been already lost by the ancestors of *Itylos*) but in the comparative peace of the neotropics continued to develop owing to that peculiar evolutionary inertia which in the absence of any obstruction keeps a structure tending to its maximum along certain inheritable lines.

In all (80 to 100) Old World and nearctic species the valve is of a very constant general shape.[1] Among the 19 neotropical species known, "normal" shape occurs in 11 species. The rest show four types of variation unparalleled elsewhere. In this respect the peculiar reduction of the valve in *Parachilades*, *Pseudochrysops* and *Cyclargus* would seem to be a case of stunting rather than the retention of a very short valve from which the normal elongate structure of the subfamily was evolved ("pulled out" as it were). In regard to *H. hanno* and *ramon* one suspects that the unusual shape is due to the irregular dwarfing of a *ceraunus*-like valve which had initially attained a very full shape (suggested by some of the Central American specimens), the "keel" in *hanno* and *ramon* being probably the remnant of an ample lower margin.

The underside wing pattern of neotropical *Plebejinæ* falls into two main types: catochrysopoid and ityloid. The catochrystopoid type (*Pseudochrysops, Cyclargus, Hemiargus* and *Echinargus*) is shared in the Old World by the small Palæotropical section (*Chilades*[2] and less strikingly, *Freyeria*) and in result, certain *Hemiargus* and *Echinargus* forms are remark-

[1] A slightly aberrant structure occurs only in *Chilades galba* and *Albulina* (*auct*) *felicis* and this leads to a false resemblance to certain *Glaucopsychinæ*.

[2] Which, moreover, in *Chilades cleotas* (a species ranging from the Malay to the New Hebrides, at least) evolves a likeness to *Talicada nyseus* (*Everinæ*), the behavior of which (deducible from a note in Moore) is that of a "protected" species. *Freyeria* on the other hand tends, mainly owing to its small size, to a *Brephidium* aspect.

ably similar to *Chilades* forms (especially to the *galba* group), the remarkable point being that while the palæotropical ones are sympatric with the kind of *Catochrysopinæ* which they resemble (and which is especially well represented in Africa, *e.g.*, "*Euchrysops*"[1]), the latter does not exist in the neotropics (where the sparse representatives of the *Catochrysopinæ* belong, as exemplified by the holarctic *Leptotes*, to a different phase of pattern). The Ityloid pattern group includes: *Itylos*, one of the two *Pseudolucia* species, *Paralycœides* (to a certain extent) and *Parachilades*. At its initial stage the "pseudovitta" of *Itylos* copies the differently formed vitta of certain palearctic *Plebejinæ* (cp. *Agrodiætus damon* or *Aricia donzelli*).

Taking 100 as the minimum number of known *Plebejinæ* (see footnote further on) the following figures may be given for the various regions where these insects occur. Only six species exist in the Palæotropical region proper, one reaching the Palæarctic, another reaching both the Palæarctic and S. Africa and a third extending into Australia. As many as 19 (probably more) exist in the neotropical region (12 of these are restricted to the Andes) and nowhere else, except for the fact that 2 reach the nearctic as 2 do in regard to the Caspian and E. Mediterranean region (these four invaders are not taken into account further on[2]). As many as 60 occur in the Central Palæarctic (between 40° and 90° longitudes). One half of these, with the addition of only half-a-dozen (most of which are poorly differentiated) not occurring elsewhere, are found in the Western Palæarctic (the whole of C., N.W. and W. Europe having 20, all of which it shares with the Mediterranean area, while 27 can be collected in a narrow area stretching from the southern Alps to the mountains of Spain); but in the Eastern Palæarctic the number dwindles to 12, all of which occur also in the Central Palearctic.

Some 30 (of which only 3 are holarctic) are found in the New World, and of these hardly a dozen exist in N. America. All these occur in its western part; only 5 reach eastern Canada and only one sparsely occurs in a large[3] area between the

[1] Provisionally: *Euchrysops* Butler, *sensu mihi*=*Euchrysops s.* Bethune Baker +*Neochrysops* Bethune Baker minus the *niobe* group, for which the erection of a separate genus is necessary.

[2] In the eastern part of the Central Palearctic half a dozen palearctic species attain along the mountain chains technically tropical territory.

[3] The paucity of true butterflies in the eastern United States is unrivalled in any other general area of the same size in the temperate part of holarctic territory.

Atlantic and the Mississippi, while 2 representatives of the neotropical group invade the more southern states.

In conclusion the following complete list of the genera of the *Plebejinæ* of the world is appended.[1]

PLEBEJINÆ (*s.s.*)

100–120 species in 24 genera

I *Parachilades* Nab.: t. *titicaca* Weymer; 1; Neot. in Andes.

II *Chilades* Moore: t. *lajus* Cramer; 4–5; PT, one reaching P.

III *Pseudochrysops* Nab.: t. *bornoi* Comstock-Huntington; 1; Neot. in W. I.

IV *Cyclargus* Nab.: t. *ammon* Lucas; 4; Neot. in W. I. to Fla.

V *Hemiargus* Hübner: t. *cerargus* Fabricius; 3; Neot., one reaching S. Nea.

VI *Echinargus* Nab.: t. *isola* Reakirt; 2; Neot., one reaching SW Nea.

VII *Pseudolucia* Nab.: t. *chilensis* Blanchard; 2; Neot. in Andes.

VIII *Pseudothecla* Nab.: t. *faga* Dognin; 1; *id.*

IX *Paralycœides* Nab.: t. *inconspicua* Weymer; 1; *id.*

X *Lycœides* Hübner: t. *argyrognomon* Bergstrasser (Tutt); 6; P, Nea, P+Nea.

XI *Freyeria* Courvoisier: t. *trochilus*; 2; PT one reaching P, the other [2] reaching AU.

XII *Plebejus* Kluk: t. *argus* Linnæus; 7–8; P, one in Nea.

XIII *Plebulina* Nab.: t. *emigdionis* Grinnell; 1; S.W. Nea.

XIV *Itylos* Draudt: t. *moza* Staudinger; 4; Neot. in Andes.

XV *Aricia* R.L.: t. *agestis* [Schiff]; 6–8; P.

XVI *Icaricia* Nab.: t. *icarioides* Boisduval; 5; W. Nea.

[1] Abbreviations: t — type of genus. P — Palearctic Region. PT — Palæotropical (excluding AU — Australia), Nea — Nearctic (excl. Florida), Neot. — Neotropical. The figure after the type refers to the number of species in the genus. When two numbers are given, the second includes additional species which I have not dissected myself, but which have been figured (genitalia) by other observers. I have not taken into account several names in Forster's (1938, *l.c.*) list which in various respects is very unreliable.

[2] The correct name of which is *Freyeria putli* Kollar — granted of course that *Chilades putli* Moore and *Chilades trochilus isophtalma* Waterhouse (*nec* Herrich-Schaffer) which I have dissected are the same as *Lycæna putli* Kollar from North India whence I have no material.

XVII *Polyommatus* Latreille: t. *icarus* Rottemburg; 7–9; P.
XVIII *Vacciniina* Tutt: t. *optilete* Knoch; 4; P, one P+Nea.
XIX *Eumedonia* Forster: t. *eumedon* Esper; 1; P.
XX *Albulina* Tutt: t. *orbitulus* Prunner; 6–7; P.
XXI *Agriades* Hübner: t. *glandon* Prunner; 4; P, one P+Nea.
XXII *Cyaniris* Dalman: t. *semiargus* Rottemburg; 1,[1] P.
XXIII *Meleageria* Stempffer: t. *meleager* Esper; 1; P.
XXIV *Agrodiætus* Hübner (incl. *Lysandra* Hemming): t. *damon* Schiff; 25–35; P.

EXPLANATION OF PLATE 1

All figures × 180 ÷ 2

1. Ædeagus of *Agrodiætus* (=*Lysandra*) *cormion* Nabokov (? hybrid between *Agrodiætus coridon* Poda and *Meleageria meleager* Esper), paratype, "Moulinet, Alpes Maritimes [S. France], 20–VII–1938 *leg.* V. Nabokov," Am. Mus. Nat. Hist., in dorsal view.

2. Ædeagus (generalised *Hemiargus* s.l. etc.) in lateral view;

3. Plain falx (*Lycœides*); 4 Humped falx (*Hemiargus* etc.);

5. Angulate falx (*Agrodiætus cormion*, same specimen as 1).

1,2. Measurements of ædeagus (= penis + sheathing): d. distal point (often notched) of suprazonal sheath shielding vesica ventrally (projecting from under the vesica in fig. 1 as seen from the dorsal side of the organ); lt. lateral edges of ventral part of suprazonal sheath (when fully developed these enfolding edges just reach the dorsal side of the organ and in dorsal view appear to line the vesica laterally as in *Agrodiætus* etc.); o. point at which the suprazonal sheath opens on the dorsal side (this point coincides with the zone in several genera, e.g. *Agrodiætus*); c. Chapman's process: a not unfrequently occurring spine-like or filament-like prolongation (of the dorsal lining of the sheath) running along the vesica. v. vesica (exposed distal portion of penis proper) studded with cornuti (minute hook-like or spine-like structures not represented in a number of genera); e. everted frothy membrane of vesica in erection; z. zone (level at which the organ is attached to the genital cavity); aa. alulæ (out-turned flaps of subzonal sheath); p. base of penis enclosed in subzonal sheath; tt. proximal tabs of subzonal sheath.

dt. length of ædeagus; dz. length of suprazonal sheath ventrally; oz. length of suprazonal sheath dorsally (excluding Chapman's process); do. length of vesical opening on the dorsal side; zt. length of subzonal sheath with breadth measured at w in lateral view; vp. length of penis proper.

3,4,5. Right uncus lobe with falx in flat ventral view; FHBUSA– falx, LUB–uncus lobe.

F– point of forearm; H– point of elbow; B– basal point of humerulus; U– posterior point of shoulder proper; S– summit of shoulder; u– anterior point of shoulder; A– apex of (proximally directed) falcal arch; L– distal point of uncus lobe.

[1] *persephatta* Alpheraky which Stempffer (followed by Forster) makes congeneric with *semiargus* (apparently on the strength of a casual note in Chapman) belongs to another subfamily (*Glaucopsychinæ*).

FH– vertical extension of forearm with its horizontal extension measured at level f; Ah– vertical extension of humerulus, and HB– horizontal extension; Sb– vertical extension of shoulder proper with its horizontal extension measured at level s; LB– vertical extension of uncus lobe with its horizontal extension measured at l. (For valve see expl. of pl. 6, fig. MOZ 3)

In *Lycœides* the triangle FHU (with HU giving the oblique length of the humerulus and with FU equal to LU) provides characters for separating the species, while in *Agrodiœtus* and some other genera the length of the elbow (AH) is of taxonomic importance.

I take the opportunity to figure the genitalia (1,5) of the curious butterfly described by me much too briefly in 1941 (J. New York Ent. Soc. **49**: 265–267). Both in ædeagus and in falx it seems to be intermediate between *A. coridon* Poda and *M. meleager* Esper.

Explanation of Plate 2

TIT — *Parachilades titicaca* Weymer (f. "*speciosa*"), prep. 488, "Sicasica, Bolivia, 1–X–1899" *ex* coll. Weeks, Mus. Comp. Zool.

CLE — *Chilades cleotas kaiphas* Fruhstorfer, prep. 585, "Morobe Dist., New Guinea, 19–II–1932, *leg.* H. Stevens" Mus. Comp. Zool.

PAN — *Chilades pandava* Horsfield [*fide* Moore] (Swinhoe 1910 [*Edales*], Chapman 1916), prep. 548, "Kandy [Ceylon]" *ex* coll. Weeks, Mus. Comp. Zool.

CON — *Chilades galba contracta* Butler (*Chilades cnejus* Chapman, *nec* Fabricius), prep. 596, "Karachi [N.W. India]" *ex* coll. Weeks, Mus. Comp. Zool.

FAG — *Pseudothecla faga* Dognin, prep. 611, "Peru," *ex* coll. Huntington, Am. Mus. Nat. Hist.

BOR — *Pseudochrysops bornoi* Comstock-Huntington, paratype, prep. 496, "Pont-Beudet, Haiti, about 100 ft. alt., 3–4–III–1922," *ex* coll. Am. Mus. Nat. Hist., Mus. Comp. Zool.

1 — Ædeagus, lateral view. 1a — tip of same in ventral view.

2 — furca (BOR with membranous lining).

3 — uncus lobe, falx and part of tegumen, ventral view.

4 — valve.

5 — rostellum.

All figures × 90 ÷ 2

Explanation of Plate 3

DOM (1–4) — *Cyclargus dominica* Moschler, prep. 501, "Baron Hill, Jackson Town (Jamaica), 1200 ft. alt., III, *leg.* L. Perkins," Mus. Comp. Zool.

AMN — *Cyclargus ammon* Lucas

AMN 1 — prep. 507 "Sierra Maestra, E. Cuba, 1,000 ft. alt., 16–VI–1930, *leg.* Clorinda Querci," *ex* coll. Weeks, Mus. Comp. Zool.

AMN 1a, 2,3,4 — prep. 375 "*id.* 23–VII–1930, *id.*," *id.*

WOO — *Cyclargus woodruffi* Comstock-Huntington, prep. 537, "Tortola, Virgin Islands, 2–IV–1925 *ex* coll. Amer. Mus. Nat. Hist., Mus. Comp. Zool.

TH. (TH., NO., BE.) — *Cyclargus thomasi* Clench

TH.TH1 — *thomasi thomasi* Clench, prep. 565, "Great Inagus, Bahamas, II–1934, Armour Exp.," Mus. Comp. Zool.

TH.TH 4 — *id.*, prep. 516, *id.*

TH.TH. 1b, 2,3 — *id.*, holotype, prep. 520, "Arthur Town, Cat Isl., Bahamas, 16–VII–1935, *leg.* W. J. Clench," Mus. Comp. Zool.

TH.NO 3 — *thomasi noeli* Comstock-Huntington, paratype, prep. 502, "Haiti, *leg.* P. R. Uhler," Mus. Comp. Zool.

TH.BE 1a — *thomasi bethune-bakeri* Comstock-Huntington, prep. 581, "Miami, Florida, 8–15–IX," *ex* coll. Weeks, Mus. Comp. Zool.

TH.BE 3 — *id.*, prep. 519, "Ft. Lauderdale, Florida, 23–VI–1933, *leg.* M. Bates," Mus. Comp. Zool.

1, a,b — ædeagus, with sagum and furca (except AMN 1a)

1 — lateral view

1 a — ventral

1 b — dorsal

2 — uncus lobe and falx, ventral view.

3 — valve

4 — comb of valve, × 360 ÷ 2

All figures, except when otherwise stated, × 90 ÷ 2

Explanation of Plate 4

HA (with abbreviations of localities) — *Hemiargus hanno* Stoll

HA. Sur. — *H. hanno hanno* Stoll, neotype, prep. 601, "Paramaribo, Surinam, 18–IV–1927," *ex* coll. Cornell Univ., Amer. Mus. Nat. Hist.

HA. Bra. — *H. hanno hanno prox.*, prep. 577, "Sao Paulo, Brazil, V, *leg.* Bruno Pohl," Mus. Comp. Zool.

HA. Ven. — *H. hanno ssp.*, prep. 537[a], "Suapure, Venezuela, 27–VI–1899," *ex* coll. Weeks, Mus. Comp. Zool.

HA. Bol. — *H. hanno ssp.*, prep. 517, "Chulumani, Bolivia, 28–XI–1898, *ex* coll. Weeks, Mus. Comp. Zool.

HA. Col. — *H. hanno bogotana* Draudt, prep. 602, "Cota, n. Bogota, Colombia, 2,600 m. alt., 28–VIII, 1938, *leg.* T. Hallinan," *ex* coll. Am. Mus. Nat. Hist., Mus. Comp. Zool.

HA. Pan. — *H. hanno ssp.*, prep. 600 "El Volcan Chiriqui, Panama, 3–III–1936, *leg.* F. E. Lutz," *ex* coll. Am. Mus. Nat. Hist., Mus. Comp. Zool.

HA. Bar. — *H. hanno ssp.*, prep. 511, "Barro Colorado, Panama, 2–II, *leg.* M. Bates," Mus. Comp. Zool.

HA. Mar. — *H. hanno ssp.*, prep. 568, "Martinique" Mus. Comp. Zool.

HA. P.R. — *H. hanno watsoni* Comstock-Huntington, paratype, prep. 569, "San Juan, Puerto Rico, 11–14–II–1914," Mus. Comp. Zool.

HA. His. — *H. hanno ssp.*, prep. 498, "La Vista and vic., La Selle Range, Haiti, 5–7,000 ft. alt., 16–23–IX–1934, *leg.* M. Bates," Mus. Comp. Zool.

RAM — *Hemiargus ramon* Dognin, prep. 616, "San Rafael, Ecuador, *leg.* E. W. Rorer, VII–1919," Mus. Comp. Zool.

CE (with abbreviations of localities) — *Hemiargus ceraunus* Fabricius

CE. CE. — *H. ceraunus ceraunus* Fabricius, prep. 570, "Kingston, Jamaica, 6–XII–1871," *ex* coll. Scudder, Mus. Comp. Zool.

CE. His. — *H. ceraunus ssp.*, prep. 499, "Ennery, Haiti, n. 1,000 ft. alt., 16–VIII–1934, *leg.* M. Bates," Mus. Comp. Zool.

CE. Nav. — *H. ceraunus ssp.*, prep. 566, "Navassa Is., West Indies, XII–1929, *leg.* W. J. Clench," Mus. Comp. Zool.

CE. Cub. — *H. ceraunus filenus* Poey, prep. 515, "Sierra Maestra, E. Cuba, 1,000 ft. alt., 10–XI–1929, *leg.* O. Querci," *ex* coll. Weeks, Mus. Comp. Zool.

CE. Bah. — *H. ceraunus ssp.*, prep. 564, "Clarencetown, Long Is., Bahamas, II–1934, *leg.* Armour Exp.," Mus. Comp. Zool.

CE. Fla. — *H. ceraunus antibubastus* Hübner, prep. 525, "Egmont, Florida, 23–IV–1904," *ex* coll. Fall, Mus. Comp. Zool.

CE. Mass. — *H. ceraunus antibubastus* Hübner, prep. 579, "So. Abington, Massachusetts, V–1880, *leg.* J. E. Bates," *ex* coll. Weeks, Mus. Comp. Zool.

CE. Ari. — *H. ceraunus gyas* Edwards, prep. 523, "Baboquavaria Mts., Pima Co., Arizona, 15–30–VII–1903, *leg.* O. C. Poling," *ex* coll. Weeks, Mus. Comp. Zool.

CE. Cal. — *H. ceraunus gyas* Edwards *prox.*, prep. 524, "San Diego, California, 14–VIII–1908, *leg.* Geo. H. Field," *ex* coll. H. C. Fall, Mus. Comp. Zool.

CE. Mex. — *H. ceraunus zachœina* Butler *prox.*, prep. 613 and 509, "Apatzingan, Michoacan, Mexico, 1,200 ft. alt., moist jungle La Majada, at mud, 8–VIII–1941, *leg.* R. Haag," Mus. Comp. Zool.

CE. C.R. — *H. ceraunus zachœina* Butler, prep. 513, "Punto Araras, Costa Rica, 11–XI–1871," *ex* coll. Scudder, Mus. Comp. Zool.

CE. Col. — *H. ceraunus ssp.*, prep. 575, "Colombia," *ex* coll. Paine, Mus. Comp. Zool.

1 — ædeagus with furca and rudimentary sagum, lateral view,
a — distal portion, ventral view
b — id., dorsal view

2 — uncus lobe, falx and part of tegumen

3 — valve

All figures × 90 ÷ 2

EXPLANATION OF PLATE 5

N.SP — *Echinargus* sp. prep. 578, "Port of Spain, Trinidad, XII–1912–V–1913, *leg.* R. Thaxter," Mus. Comp. Zool.

ISO — *Echinargus isola* Reakirt

ISO 1,2 — prep. 540, "Tancitaro, Michoachan, Mexico, 6,000 ft. alt., on *fæces*, 10–VII–1941, *leg.* R. Haag," Mus. Comp. Zool.

ISO 1a, 3 — prep. 478, "Round Mt., Texas, IX–1930, *ex* coll. Fall," Mus. Comp. Zool.

CHI — *Pseudolucia chilensis* Blanchard

CHI 1, a,b — prep. 619, "Central Chile, 1882–1885, *leg.* H. B. James," *ex* coll. Weeks, Mus. Comp. Zool.

CHI 2,3,4 — prep. 534, "Penco, Chile," *ex* coll. Weeks, Mus. Comp. Zool.

COL — *Pseudolucia collina* Blanchard, prep. 536, "Penco, Chile," *ex* coll. Weeks, Mus. Comp. Zool.

1,a, b, ædeagus with sagum and furca (ISO 1a, sagum separate)

1 — lateral view, 1 a, ventral view, 1 c, dorsal view

2 — uncus lobe, falx and part of tegumen

3 — valve

4 — comb of valve × 360 ÷ 2

All figures, except when otherwise stated, × 90 ÷ 2

EXPLANATION OF PLATE 6

INC — *Paralycœides inconspicua* Draudt, prep. 607, "Cuzco, Peru, 3,500 m. alt., *leg.* Fassl," *ex* coll. W. P. Comstock, Am. Mus. Nat. Hist.

KOA — *Itylos koa* Druce, prep. 592, "Puno, Peru, 12,500 ft. alt., 1–XI–1898," *ex* coll. Weeks, Mus. Comp. Zool.

PAC — *Itylos pacis* Draudt, prep. 609, "Cuzco, Peru, 3,500 m. alt., *leg.* Fassl" *ex* coll. W. P. Comstock, Am. Mus. Nat. Hist.

RUB — *Itylos ruberrothei* Weeks

RUB 1,a,2,3 — holotype, prep. 527, "Sicasica, Bolivia, 1–X–1899" *ex* coll. Weeks, Mus. Comp. Zool.

RUB 4 — paratype, prep. 486, "Alezum, Bolivia, 8–VIII–1899" *ex* coll. Weeks, Mus. Comp. Zool.

MOZ — *Itylos moza* Staudinger, prep. 606, "Bolivia," *ex* coll. Huntington, Am. Mus. Comp. Zool.

1 — ædeagus with furca, lateral view (except RUB 1 where the furca is not shown and KOA 1 where it is in ventral view as also in RUB 1a)
a — ædeagus, ventral view

2 — Uncus lobe, falx and part of tegumen (note VAP 2 to which the method of measurement used for *Lycœides* has been applied)

3 — Valve: sp — superior process; r — rostellum (free end of superior process); c — comb (serrated distal margin of rostellum); ip — inferior process; m — mentum (jutting end of inferior process); b — bullula (membranous swelling between mentum and rostellum); bs — base. The length of the valve is measured from m to bs; its breadth at the broadest part (at the "hump" or Bayard's angulation).

4 — comb of valve $\times$ 360 $\div$ 2:

All other figures $\times$ 90 $\div$ 2

EXPLANATION OF PLATE 7

Female armature

TIT — *Parachilades titicaca* Weymer, prep. 590, "Sicasica, Bolivia, 1–X–1899," *ex* coll. Weeks, Mus. Comp. Zool.

BOR — *Pseudochrysops bornoi* Comstock-Huntington, paratype prep. 605, "Pont Beudet, Haiti, about 100 ft. alt., 3–4–III–1922," *ex* coll. Am. Mus. Nat. Hist., Mus. Comp. Zool.

AMN — *Cyclargus ammon* Lucas, prep. 530, "Sierra Maestra, E. Cuba, 1,000 ft. alt., 3–XI–1929, *leg.* O. Querci," *ex* coll. Weeks, Mus. Comp. Zool.

HAN — *Hemiargus hanno hanno* Stoll *prox.*, prep. 532, "São Paulo, Brazil, V, *leg.* Bruno Pohl," Mus. Comp. Zool.

CER — *H. ceraunus antibubastus* Hübner, prep. 582, "Ft. Lauderdale, Florida, 10–VII–1933, *leg.* M. Bates," Mus. Comp. Zool.

N. SP — *Echinargus sp.*, prep. 597 "Port of Spain, Trinidad, XII–1912–V–1913, *leg.* R. Thaxter," Mus. Comp. Zool.

ISO — *Echinargus isola* Reakirt, prep. 587, "Dallas, Texas, *leg.* Boll," Mus. Comp. Zool.

CHI — *Pseudolucia chilensis* Blanchard, prep. 533, "Penco, Chile," *ex* coll. Weeks, Mus. Comp. Zool.

COL — *Pseudolucia collina* Philippi, prep. 591, "Penco, Chile," *ex* coll. Weeks, Mus. Comp. Zool.

MOZ — *Itylos moza* Staudinger, prep. 528 (*Lycæna babhru* Weeks, holotype) "Sicasica, Bolivia 1–X–1899," *ex* coll. Weeks, Mus. Comp. Zool.

KOA — *Itylos koa* Druce, prep. 593, "Puno, Peru, 12,500 ft. alt., 1–XI–1898," *ex* coll. Weeks, Mus. Comp. Zool.

1 — papillæ anales (Kusnezov 1912) (note pathological swelling of rod of left papilla in N. SP. 1a)

2 — fibula, with or without portion of henia, dorsal view

3 — same, lateral view

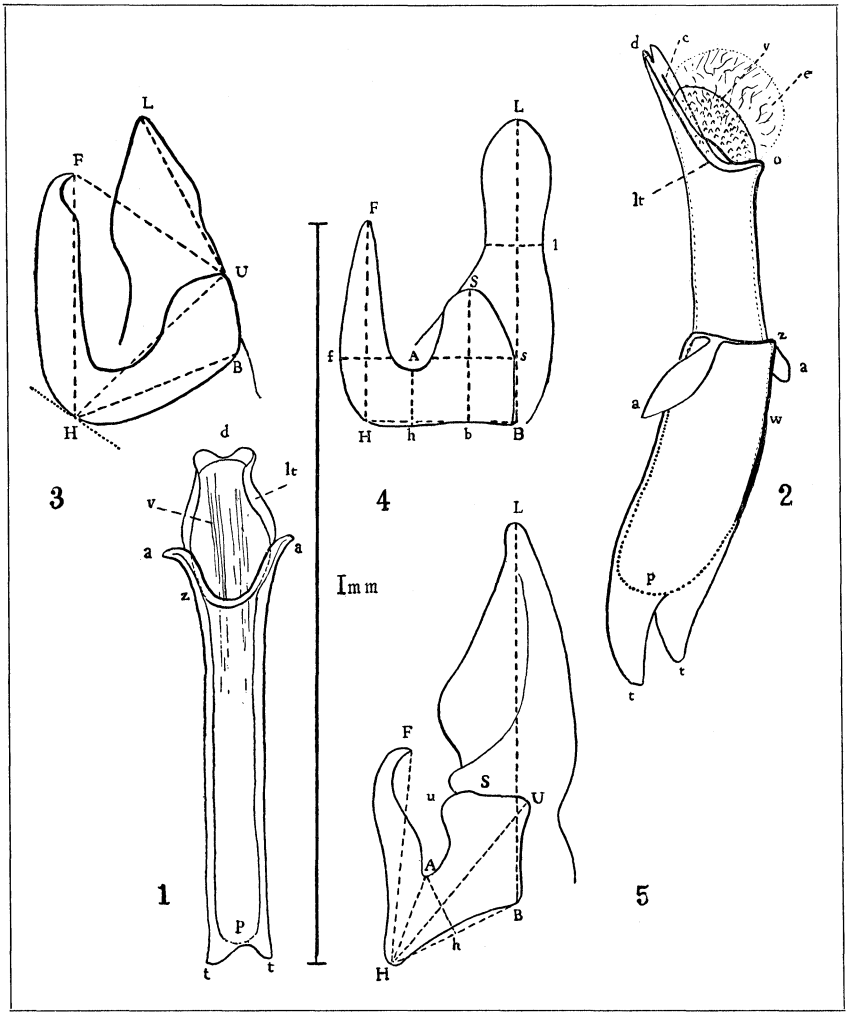
4 — henia (Chapman 1916), completely exserted in COL 4 and ISO 4, lateral view.

All figures × 90 ÷ 2

Explanation of Plate 8

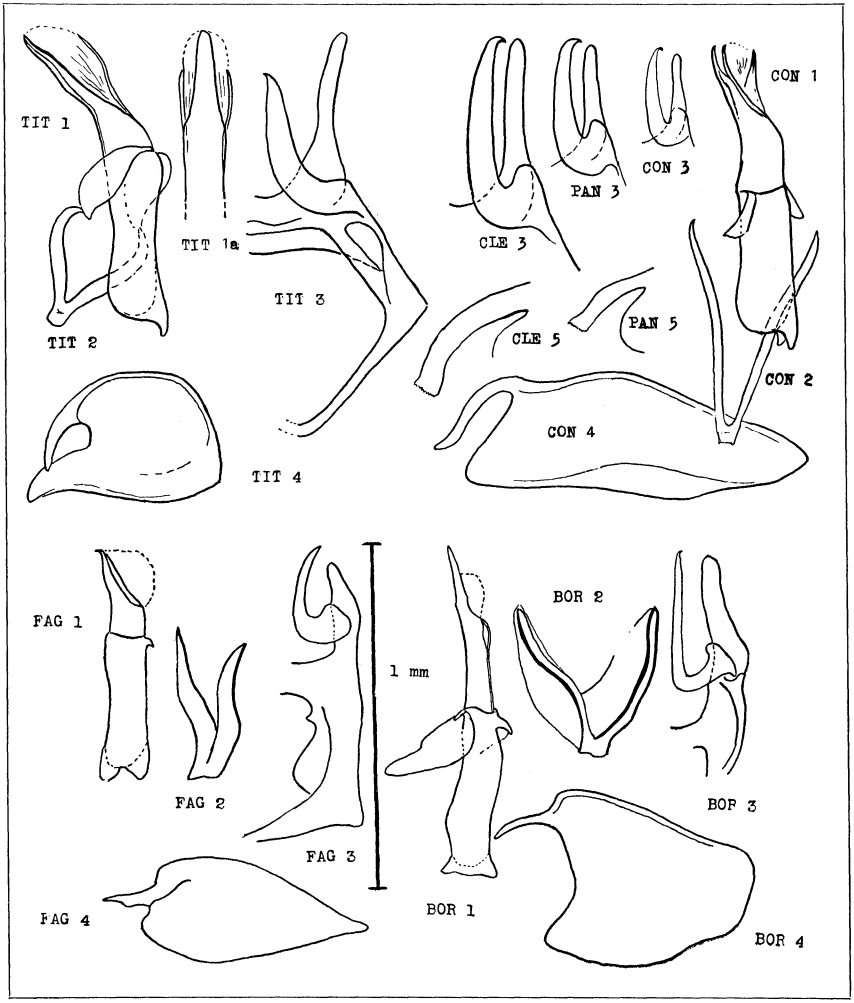
Echinargus, n. sp., "Port of Spain, Trinidad, XII–1912–V–1913, *leg.* R. Thaxter," Mus. Comp. Zool. Left Hindwing underside, × 6.5.

PSYCHE, 1945 VOL. 52, PLATE 1



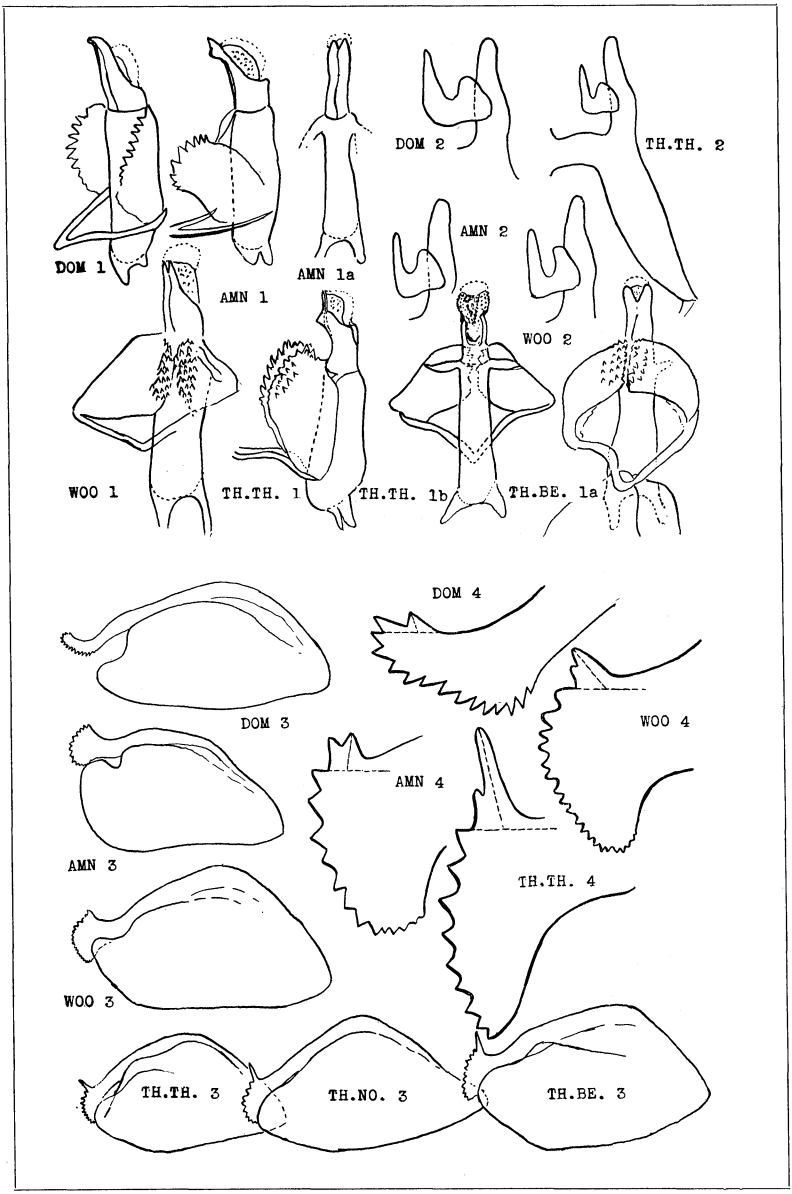
NABOKOV — NEOTROPICAL PLEBEJINÆ

PSYCHE, 1945 VOL. 52, PLATE 2



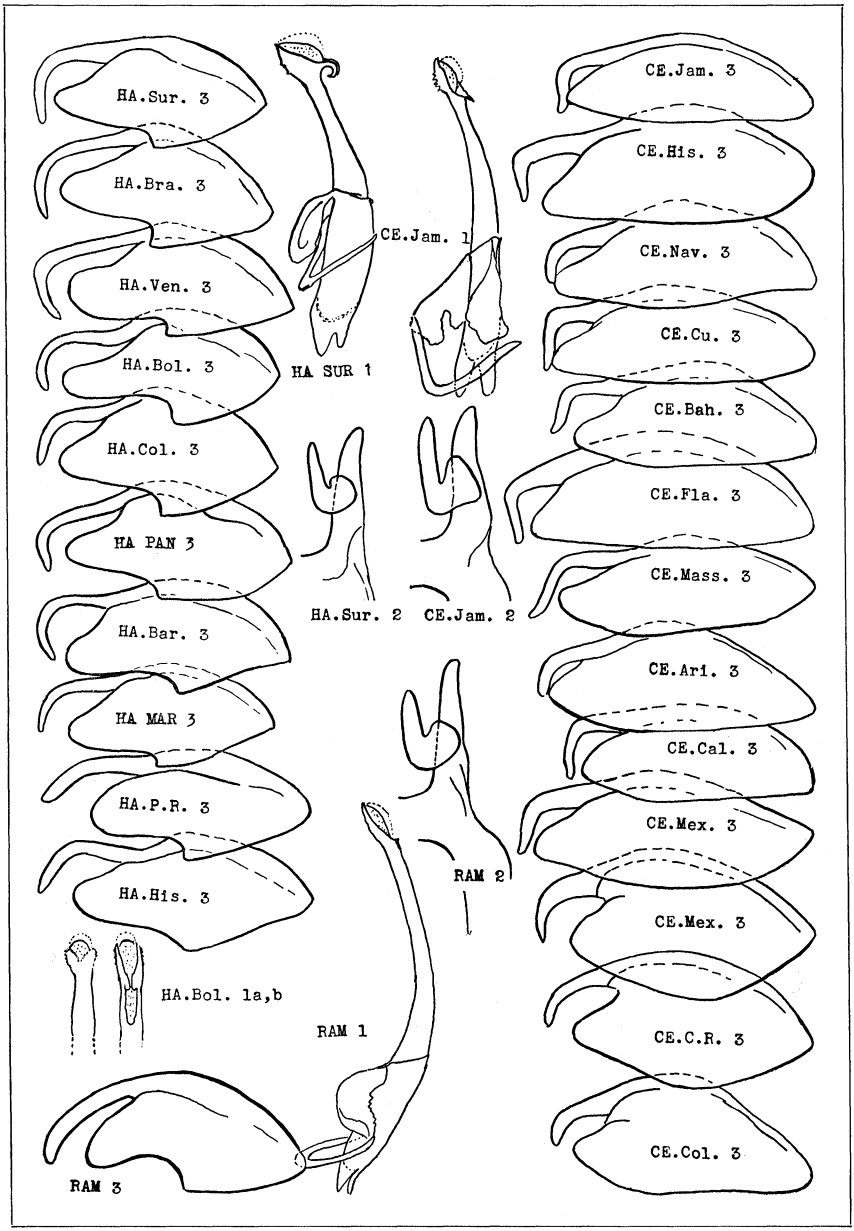
NABOKOV — NEOTROPICAL PLEBEJINÆ

PSYCHE, 1945 VOL. 52, PLATE 3



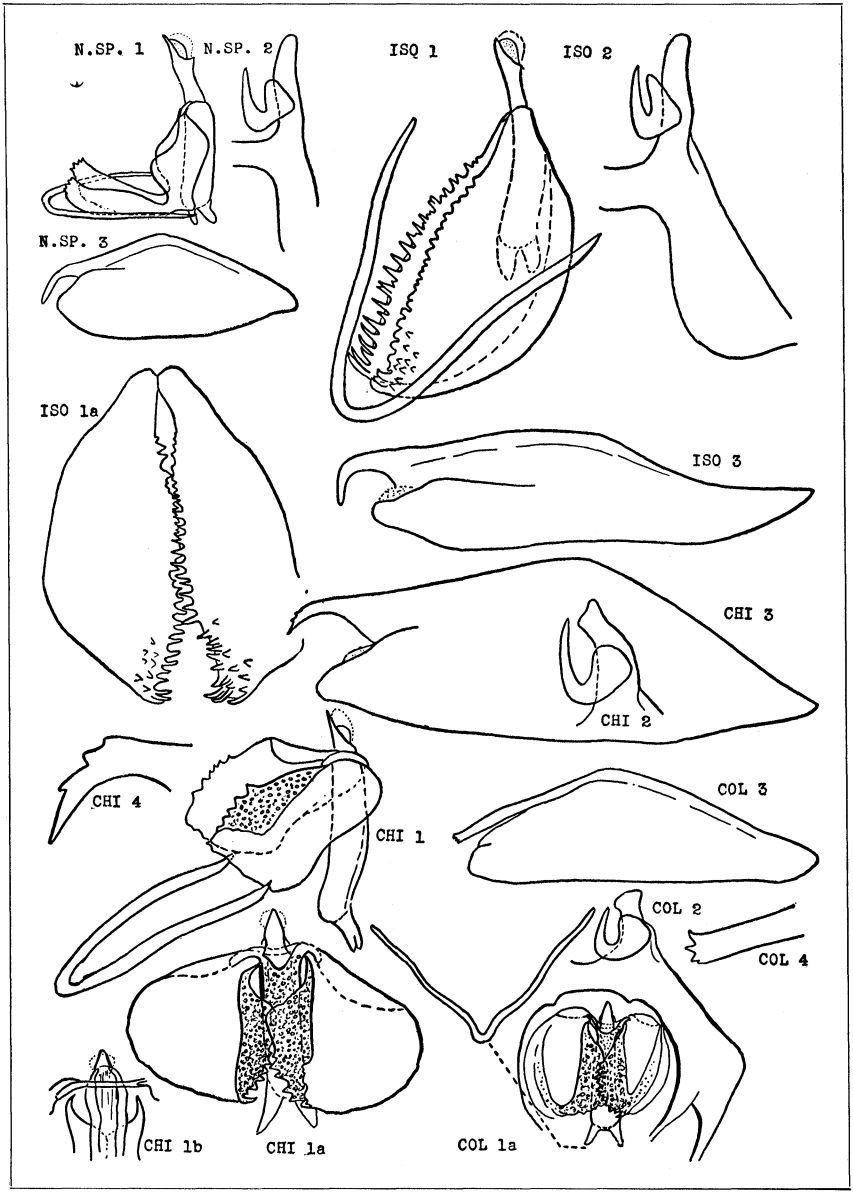
NABOKOV — NEOTROPICAL PLEBEJINÆ

PSYCHE, 1945 VOL. 52, PLATE 4



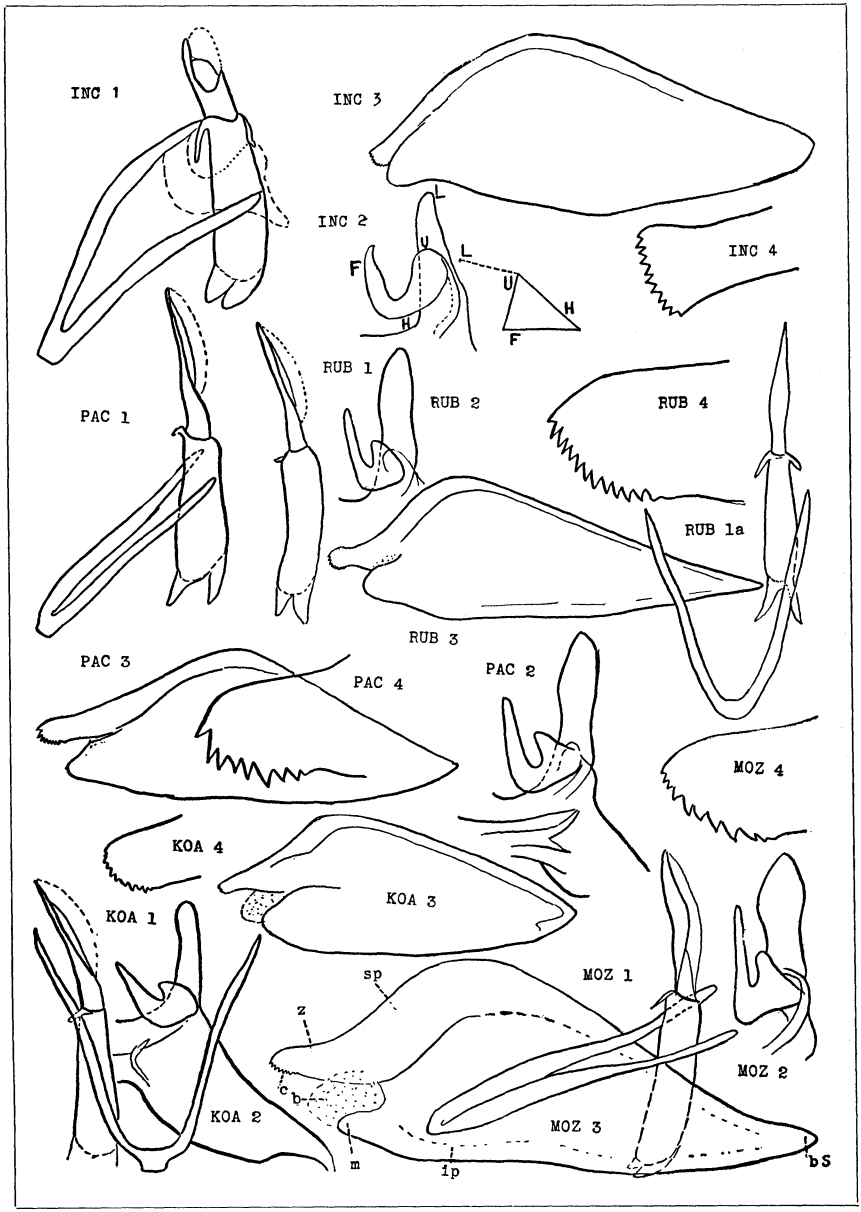
NABOKOV — NEOTROPICAL PLEBEJINÆ

PSYCHE, 1945 VOL. 52, PLATE 5



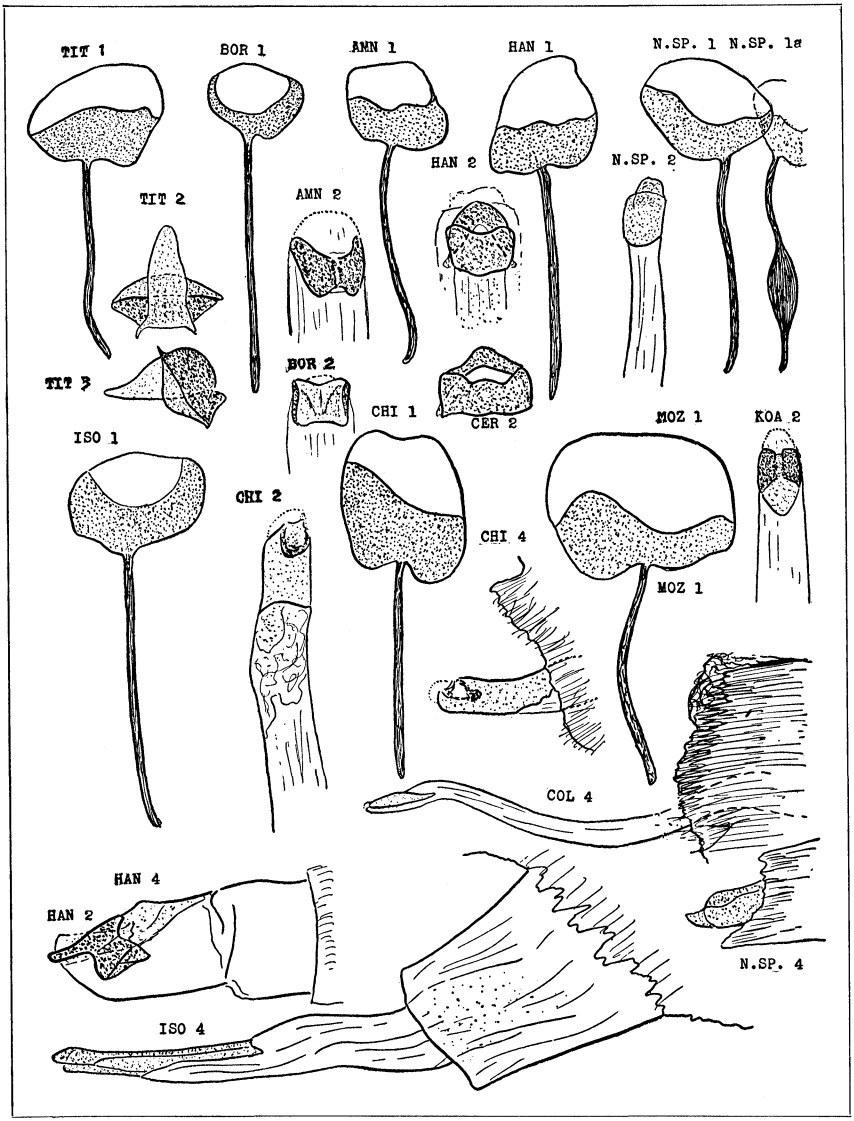
NABOKOV — NEOTROPICAL PLEBEJINÆ

PSYCHE, 1945 VOL. 52, PLATE 6



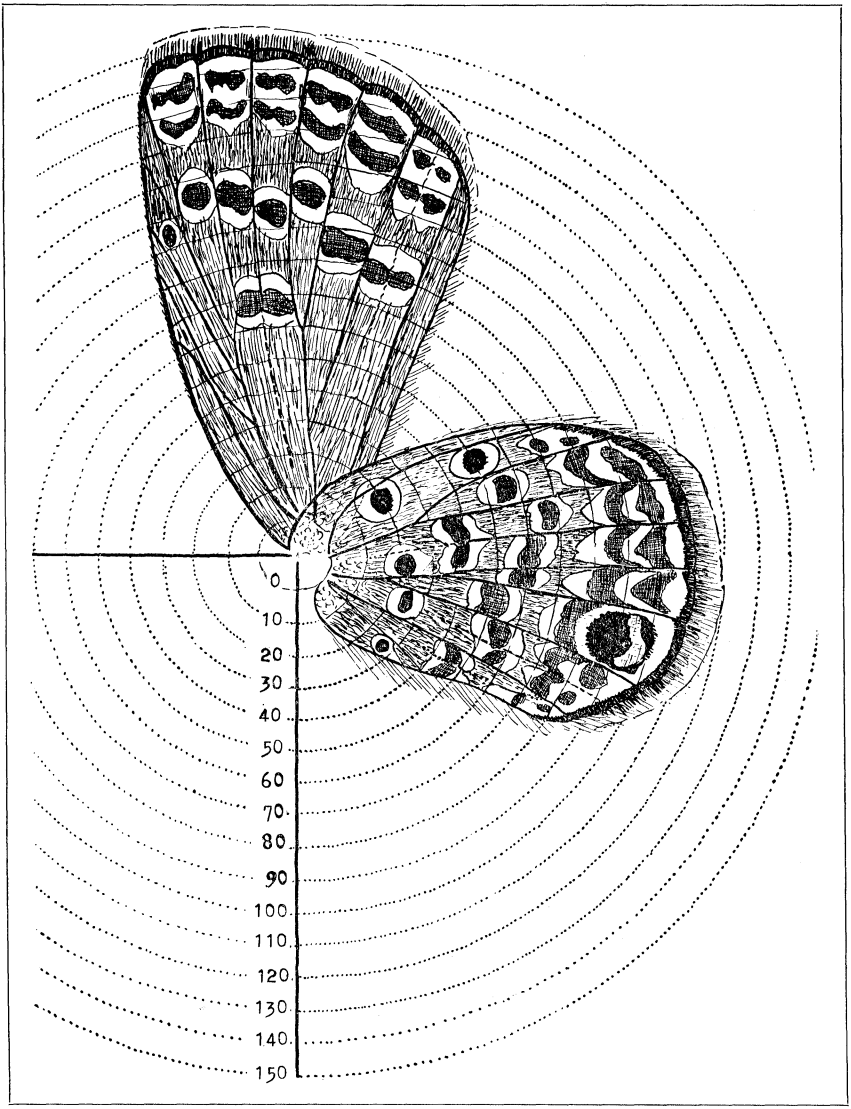
NABOKOV — NEOTROPICAL PLEBEJINÆ

PSYCHE, 1945 VOL. 52, PLATE 7



NABOKOV — NEOTROPICAL PLEBEJINÆ

PSYCHE, 1945 VOL. 52, PLATE 8



NABOKOV — NEOTROPICAL PLEBEJINÆ