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TB 1201 (1959)

USDA TECHNICAL BULLETINS

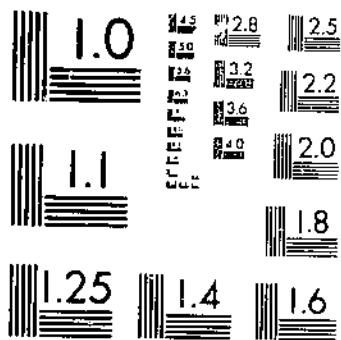
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THE FRUIT-PIERCING MOTHS OF THE GENUS GONODONTA HUBNER (LEPIDOPTERA)

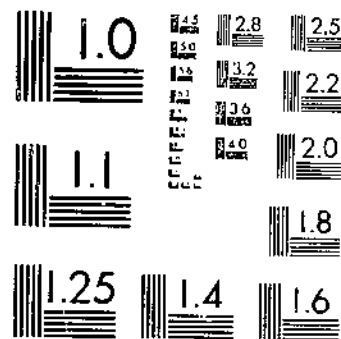
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THE FRUIT-PIERCING MOTHS OF THE GENUS GONODONTA HÜBNER

(LEPIDOPTERA, NOCTUIDAE)

By E. L. TODD

TECHNICAL BULLETIN NO. 1201

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

Washington, D. C.

Issued July 1959

CONTENTS

	Page
<i>Gonodonta</i> Hübner	1
Nomenclatorial remarks	3
Distribution	4
Biology and economic importance	5
Key to the species	7
The species of <i>Gonodonta</i>	11
Unrecognized species	50
Literature cited	50
Index to the species and subspecies	52

ACKNOWLEDGMENTS

The author expresses his appreciation to the curators and the lepidopterists of the following institutions for lending him specimens: American Museum of Natural History, New York, N. Y.; British Museum (Natural History), London, England; Carnegie Museum, Pittsburgh, Pa.; Cornell University, Ithaca, N. Y.; División de Entomología, Ministerio de Agricultura y Cría, Maracay, Aragua, Venezuela; Facultad de Agronomía, Instituto de Biología Agrícola, Universidad Central de Venezuela, Maracay, Aragua, Venezuela; Instituto de Biología, México, D. F., México; Museo de Historia Natural, Universidad de Oriente, Santiago de Cuba, Oriente, Cuba; and Museum of Comparative Zoology, Harvard University, Cambridge, Mass.

He is also indebted to J. G. Franclemont, Cornell University, and René Lichy, Caracas, D. F., Venezuela, for

the opportunity of studying specimens from their private collections. He is especially grateful to D. S. Fletcher of the British Museum (Natural History) and F. Fernández Yépez of the Universidad Central de Venezuela. Mr. Fletcher provided much information concerning types and made many comparisons of specimens sent to him with the types in the British Museum. Dr. Fernández and his associates during 1955-57 collected approximately 600 additional specimens for study, including specimens of two species described as new in this bulletin plus series of other species that had been known previously from only a few specimens.

Most of the line drawings of the male and female genitalia were made by Arthur Cushman, Entomology Research Division, United States Department of Agriculture, from slides of the genitalia prepared by the author.

THE FRUIT-PIERCING MOTHS OF THE GENUS GONODONTA HÜBNER (Lepidoptera, Noctuidae)

By E. L. Todd, *entomologist, Entomology Research Division,
Agricultural Research Service*

The adults of several species of the Neotropical genus *Gonodonta* Hübner pierce various citrus fruits, especially oranges, and may occasionally cause extensive losses. Their economic importance and the fact that the genus as a whole was last treated taxonomically by Walker (1857, pp. 946-958)¹ point out the need for the present taxonomic study of this interesting genus of moths.

This study has been based on material in the collection of the United States National Museum, Washington, D. C., and has been supplemented by other material from the sources indicated in the acknowledgments. More than 2,000 specimens were examined. The techniques were those generally utilized in taxonomic studies of Lepidoptera. Most of the terms used have been defined by Forbes (1954, pp. 6-14) and/or Torre-Bueno (1937). The few exceptions, such as adterminal line, are self-explanatory.

GONODONTA HÜBNER

Gonodonta Hübner, 1818, *Zuträge zur Sammlung Exotischer Schmettlinge* [sic], *Erstes Hundert*, p. 11; 1823, *Verzeichniss Bekannter Schmettlinge* [sic], p. 263. — Guéneé, 1852, *Histoire Naturelle des Insectes, Species Général des Lépidoptères*, v. 6 (Noctuérites II), p. 364. — Walker, 1857, *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum*, pt. 12, p. 946. — Druce, 1887, in *Godman and Salvin, Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera*, v. 1, pt. 60, p. 253. — Schaus, 1940, *Scientific Survey of Porto Rico and the Virgin Islands*, v. 12, pt. 2, p. 257. (Type of genus: *Phal.[aena] Noct.[ua] sicheas* Cramer, present designation.)

Athysania Hübner, 1823, *Verzeichniss Bekannter Schmettlinge* [sic], p. 263. (Type of genus: *Phal.[aena] Noct.[ua] chorinea* Cramer, monobasic.)

Head prominent; front simple, not extended (in some species a subconical tuft of long, erect scales may be present, giving the front an extended appearance). Eyes large, globoid, naked, without lashes. Ocelli present. Proboscis well developed; apical part heavily sclerotized, sharp pointed, armed with stout, recurved spines on dorsal and lateral surfaces, apical one-third of venter with two series of thin, lanceolate, depressed, distally directed

¹For further information about the publication, see Literature Cited, p. 50.

²The designation by Hampson, 1926, *New Genera and Species of Noctuidae* in the British Museum, p. 373, of "*capucina*, Esp." (*Bombyces* [*Bombyx*] *capucina* Esper) as the type of *Gonodonta* Hübner is invalid, as it was not one of the species originally included by Hübner.

setae (pl. 6, *F*). Labial palpus obliquely porrect or slightly up-curved, not reaching above vertex of head; second segment long; third segment very short, about as wide as long, frequently nearly hidden by vestiture of second segment. Antenna simple, distal half weakly serrate and ciliate.

Forewing (except *G. ditissima* Walker, pl. 6, *D*) with tooth at tornus, frequently with scale tooth near middle of inner margin (pl. 6, *A*), or less commonly with tooth at that point (pl. 6, *D*); termen evenly rounded or very weakly angulate. Hindwing with costa slightly expanded along basal half; termen more or less rounded, occasionally weakly angulate at M_3 , usually straight or slightly concave between M_3 and second A (conspicuously concave in male of *G. distincta*, n. sp.). Venation of normal quadrid type (pl. 6, *A*), but with cell of hindwing and position of certain veins, especially those of M_2 - Cu_2 series of hindwing, somewhat modified in some species (pl. 6, *B*, *C-D*).

Tibia of middle leg of male with dense tuft of long, light-colored hairs (hair pencil) concealed under dorsal fold. Tibial spurs well developed, inner spur of each pair much longer than outer spur, all spurs visible. Schaus (1940, p. 257) stated that only the terminal spurs on the hind tibiae were visible.

Abdomen of male with some firmly attached, specialized scales of unknown function on fifth and sixth sternites (pl. 6, *G*) and with tufts of long hairs on eighth sternite. Specialized scales of fifth sternite forming a linear series along posterior margin of sternite and varying in number and shape, part of scales (number varying from 2 to 6 between and within the species) being much larger than rest and ovate, lanceolate, or spatulate in shape; specialized scales of sixth sternite occurring in irregular, ovate mass on anterior part of that sternite, clavate in shape, ribbed longitudinally, and serrate apically.

Male genitalia rather simple. Uncus simple, slender, moderately long, occasionally weakly but seldom strongly cygnate. Valve simple, roundly truncate at apex; costa sinuous, terminating in short, blunt, dorsally directed projection; corona absent; sacculus extended into long, curved process that usually reaches and often exceeds apex of valve; clasper, ampulla, and other modifications of inner face of valve absent. Juxta small to moderate, elliptical or subrectangular, bulbous (except *G. separans* Walker, in which juxta is very large, bulbous, and with dorsally directed lateral arms, each bearing as cluster of spines at inner face of apex). Aedeagus variable in shape and size, usually short and stout; vesica usually massive with many lobes and always armed with cornuti, although variable in number, shape, and size.

Female genitalia usually rather small. Ductus bursae usually short, broad, rather heavily sclerotized, usually divided into two parts; bursa copulatrix usually with numerous longitudinal, sclerotized folds, in some species folds occurring only on posterior half; signa absent; ductus seminalis usually from dorsal or dorso-lateral surface near middle of or less frequently from near posterior end of bursa copulatrix. Posterior margin of seventh

abdominal sternite truncate or slightly rounded. Internal apophyses of eighth and ninth segments short.

The American species of other erebine genera, except *Calpe* Ochsenheimer, that have the proboscis modified for piercing and a similar wing shape, i. e., *Othreis* Hübner, *Trissophaes* Hübner, *Graphigona* Walker, *Ferenta* Walker, and *Plusiodonta* Guénéé, all differ from the species of *Gonodonta* Hübner, in that the third segment of the labial palpus is several times as long as wide and erect, reaching to or well above the vertex of the head. In the closely related genus *Calpe* Ochsenheimer, the labial palpus is decumbent, the third segment pointing obliquely ventrad, and the length variable, rather short in some Old World species, but still longer than wide.

Except for *G. pyrgo* (Cramer) and *nutrix* (Cramer), the species of *Gonodonta* are divided into the *sicheas* and *chorinea* groups. The *sicheas* group has the following characters: Second segment of labial palpus not tufted ventrally at apex; front of head with subconical mass of long, erect scales; costal margin of forewing distinctly lighter in color than median part of wing, usually white or white suffused with other colors; male and female genitalia exhibiting well-marked specific differences.

The *chorinea* group has the following characters: Second segment of labial palpus tufted ventrally at apex; scales of front of head not produced into subconical mass; costal margin of forewing not lighter in color than median part of wing; male and female genitalia not obviously specifically distinct, existing differences being slight differences of degree in length and shape of various structures, differences seldom of greater magnitude than individual variation within a species.

G. pyrgo agrees with the species of the *sicheas* group, except that the apex of the second segment of the labial palpus has a well-developed ventral tuft and the scaling of the front of the head is rather intermediate. *G. nutrix* obviously belongs to the *chorinea* group, but the costal margin of the forewing is white and much lighter than the median part of the wing.

The coloration of the abdomen and of the inner margin of the hindwing generally differs in the two groups—orange in the *sicheas* group and brown or black in the *chorinea* group—but there are more intermediate species when those characters are employed to separate the two groups. Because of the intermediate species, I prefer to treat the two assemblages as species groups rather than subgenera, but if others wish to consider the groups as subgenera, the names *Gonodonta* Hübner and *Athysania* Hübner would be available.

NOMENCLATORIAL REMARKS

The following discussion of two nomenclatorial problems encountered in this study is provided to explain the treatment of certain generic and specific names in this bulletin.

The first problem relates to the use of *Gonodonta* Hübner (Zuträge zur Sammlung Exotischer Schmettlinge [sic], Erstes

Hundert, Augsburg, 1818, p. 11) rather than *Ptilodon* Hübner (Erste Zuträge zur Sammlung Exotischer Schmetterlinge, Augsburg, 1808, p. 4). Many lepidopterists have not accepted the latter paper, as there is considerable doubt that it was actually published. Furthermore, J. G. Franclemont of Cornell University has applied (Z.N. 353) to the International Commission on Zoological Nomenclature for the suppression, for nomenclatorial purposes, of Hübner's Erste Zuträge. Even if the Commission were to rule against suppression, there still remains the question of whether Hemming (1937, p. 439) is correct in his opinion that the subsequent publication of the plates of the Erstes Hundert of the Zuträge zur Sammlung Exotischer Schmettlinge [sic] in 1809-13 validated the names that were nomina nuda in Hübner's Erste Zuträge. Therefore, it seems desirable to use the familiar name *Gonodonta* Hübner for the taxon studied.

The second nomenclatorial problem relates to the validity of the names on plate 90, volume 7, of Seitz, Die Gross-Schmetterlinge der Erde, [1919-46]. This plate is one of several in this volume that were issued without covers and without text during or shortly after World War II. Accordingly, its date of publication is not known with certainty and is listed herein as [1940-46]. The plate is entitled "Anomis - Athysania." It is known from other plates with similar titles and for which text is available that the first generic name may be applied safely only to the figure at the extreme left of the top row and that likewise the second generic name may be applied with certainty only to the figure at the extreme right of the bottom row. The only way to determine the generic name or names for the other figures would be to examine the text that pertains to them. The specific names used are placed under each figure. Two of these names that refer to species of *Gonodonta* are new, but until text is available, they cannot be considered valid, and furthermore they apply to previously described species. Because of the absence of text and the uncertain date of publication, citations to this plate are not given in the specific bibliographies, but they are given in the text discussion, so that the figures may be used to help identify specimens.

DISTRIBUTION

Most of the species of *Gonodonta* appear to occur throughout the continental Neotropical region, except for the more arid areas. The absence of most, if not all, of the species in the arid areas may be due to the lack of food plants. Since only a few of these plants are known, such a suggestion may be erroneous, and other limiting factors may be responsible.

Thirty of the thirty-seven known species have been collected in Venezuela, and 5 others may occur there. I have examined specimens of 21 species from México and 24 species from southern Brasil, Paraguay, and northern Argentina. Sixteen species occur in both México and the South American countries mentioned. Seven species—only 1 of the *sicheus* group—occur throughout the Antilles, 6 of which are also found throughout Central and tropical

South America. The seventh, *G. nitidimacula* Guénéé, is known to occur on the mainland only in Venezuela, México, and Guatemala. Two species are found in southern Texas, 1 of them also has been captured in Arizona, and 4 others occur in Florida.

Species that appear to have rather restricted ranges are *G. unica* Neumoegen in Florida and Cuba; *distincta*, n. sp., in Venezuela; *amianta* (Hampson) in British and French Guiana; *paraequalis*, n. sp., in México and Guatemala; *separans* Walker from Tefé, Amazonas, Brasil; and *sitia* Schaus in Costa Rica, Panamá, and Colombia.

BIOLOGY AND ECONOMIC IMPORTANCE

Very little is known concerning the immature stages of the species of *Gonodonta*. The larvae of only seven species have been described. Six of these species belong to the *chorinea* group. They are semiloopers and lack prolegs on the third abdominal segment. Crumb (1956, pp. 269, 319, 321) has treated two of them and given characters by which they may be separated from species of other catocaline genera. The larva of the seventh species, which belongs to the *sicheas* group, was described by Mabilde (1896, p. 207) under the name *Gonodonta evadens* Walker, a synonym of *G. biarmata biarmata* Guénéé. In that description he stated that the larva has only two pairs of intermediate legs. If this observation is correct, the *chorinea* and *sicheas* groups may differ in the number of prolegs, and other characters, such as the difference in the shape of the front of the head (see Crumb 1956, p. 319), would have to be employed to separate larvae of the *sicheas* group from larvae of *Plusiodonta* Guénéé, which lack prolegs on the third and fourth abdominal segments.

The known larvae of the *chorinea* group are rather distinctive in coloration, the ground color being black or dark reddish brown, especially in the early instars, with dorsal and lateral spots of orange, pale yellow, or white. The number, size, and shape of these spots appear to vary according to the species, but all the larvae available to me—*G. unica* Neumoegen, *nutrix* (Cramer), and two other species, presumably *clotilda* (Stoll) and *chorinea* (Cramer)—have spots on the anterior margin of the prothoracic shield and the anterior side of the dorsal hump of the eighth abdominal segment. The larvae of *unica*, *clotilda*, and *nitidimacula* Guénéé have several fine, transverse, pale-yellow or white lines on each segment.

The larvae that are known feed on the leaves of plants, especially of the families Annonaceae (*Annona*, *Asimina*, and *Orandra*) and Piperaceae (*Piper* and *Pothomorphe*), but genera of other families, such as *Brunfelsia* and *Lycopersicon* (Solanaceae), *Ocotea* and *Persea* (Lauraceae), and *Ocimum* (Labiatae), have also been reported as food plants. Mabilde (1896, p. 208) reported that the larvae of *G. b. biarmata*, as *G. evadens*, feed on "diversas trepadeiras de sapos ordinarios, assim como na coirana," [various climbing vines of ordinary lianas, as well as on coirana]. The term "coirana" may refer to species of *Cestrum* or *Solanum*. The

host record "Arbes de Coton" [*Bombax* sp. (?)] listed by Stoll (1791, p. 92, pl. 18, fig. 8 [1790]) is not included here, because the larva illustrated is not that of *G. nutrix* as stated, and it is unlikely that it represents any other species of *Gonodonta*. The illustration is of a pale-green larva with a longitudinal, lateral, white band and four pairs of abdominal prolegs!

According to Swainson (1901, p. 81), the larvae of *G. incurva* (Sepp) pupate in a nest of cut-up leaves. She also stated that the nest is attached to the stem in a "curious way," but she did not explain further the method of attachment.

Bruner, Scaramuzza, and Otero (1945, p. 13) reported that *Lydellohoughia* sp. (Tachinidae), *Apanteles aletiae* Riley (Braconidae), and *Euplectrus platyhypenae* Howard (Eulophidae) parasitize the larvae and that *Trichogramma minutum* Riley (Trichogrammatidae) attacks the eggs of *G. nutrix*.

Unlike the larvae, which are not known to be of economic importance, the adults of some species of *Gonodonta* have occasionally caused injury of economic proportions to citrus by piercing the fruit. All the species of *Gonodonta* have the proboscis modified for piercing, but only five species—*nutrix*, *incurva*, *pyrgo* (Cramer), *clotilda*, and *bidens tenebrosa*, n. subsp.—have actually been observed feeding on citrus. One other species, *G. uxoria* (Cramer), as *G. marmorata* Schaus, has been reported feeding on different kinds of fruit in the laboratory by Bruner, Scaramuzza, and Otero (1945, p. 145). Oranges, tangerines, and grapefruit may be attacked, but the greatest injury has been to oranges. Other kinds of fruit that are known to be pierced are *Annona squamosa* (sugar-apple, anón) and *Flacourtia ramontchi* (governor's plum). Undoubtedly other tropical fruit are also injured, but observations are lacking, probably because of the nocturnal habits of the moths.

Fennah (1942, p. 54) described as follows how *G. incurva* and *Othreis apta* puncture the fruit: "... the moth uncoils the tongue and presses the barbed tip against the surface of the fruit and rocks the tip on its point by a rapid alternate inflation and deflation of the tongue by blood pressure." It is reported that a single fruit may be punctured many times. Fennah stated "... as many as a dozen times. ..." He also said that *Gonodonta*, presumably *incurva*, does not use a single hole more than once. John R. King, Citrus Experiment Station, University of Florida, informed me that he has counted as many as 14 punctures by *G. nutrix* in a single fruit from a grove near Fort Pierce, Fla. On the other hand, James Zetek, formerly of the Canal Zone Biological Area Smithsonian Institution, Barro Colorado Island, stated³ that in Panamá there were only 1 or 2 holes per fruit in oranges, but there were usually about 20 and sometimes as many as 100 punctures in grapefruit. However, the injuries observed by Zetek were the work not only of *G. pyrgo* but also of other fruit-piercing moths of other genera.

³ Observational notes accompanying specimens of lot No. 40 7692, dated Apr. 26, 1940. [Unpublished.]

The punctures made by these moths permit the oxidation and fermentation of the fruit, and subsequently it drops and rots. Injured fruit is attractive to other more abundant species of moths, which are nonpiercing, and it may also be invaded by saprophytic Diptera and Coleoptera. Many of the nonpiercing species of moths have been reported in the lists of fruit-piercing moths of various areas of the world, but an examination of their mouth parts indicates that they only feed on the injured fruit and do not cause primary injury.

Occasionally injuries caused by species of *Gonodonta* may reach serious economic proportions. Extensive losses to oranges of 10 to 100 percent of the crop occurred in México in the States of San Luis Potosí, Tamaulipas, and Nuevo León in the fall of 1953. The species causing most of the damage was *G. b. tenebrosa*, but *nutrix* was also involved. In 1941 there was a serious outbreak in Matanzas, Cuba, but the area in which the loss occurred was not nearly so extensive as in México. The species injuring fruit in Cuba was *nutrix*. It occurs throughout most of the Neotropical region and reaches southern Florida. It has never been reported as abundant in that State, but even so it probably does some damage in some areas there. King and Thompson (1958, pp. 61-65) have recorded observations on the activities of *nutrix* in Florida. They stated that about 20 percent of the fruit in two orange groves in St. Lucie County had been pierced.

Control measures that have been used, with varying degrees of success, include prompt harvesting of ripe fruit, poison baits, and repellents. Fennah (1942, p. 55) suggested that in Dominica successful control might be accomplished by destroying the food plants of the larvae.

KEY TO THE SPECIES¹

- | | | |
|----|---|----|
| 1. | Tornus of forewing produced, forming a tooth ----- | 2 |
| | Tornus of forewing rounded, not toothed ----- <i>ditissima</i> (p. 11) | |
| 2. | (1) Costal margin of forewing distinctly lighter in color than median part of wing, usually white or white suffused with other colors ----- | 3 |
| | Costal margin of forewing not distinctly lighter in color than median part of wing ----- | 17 |
| 3. | (2) Apex of second palpal segment tufted ventrally, appearing wider at apex than at middle ----- | 4 |
| | Apex of second palpal segment not tufted ventrally, width more or less uniform throughout its length ----- | 5 |
| 4. | (3) Inner margin of white costal streak of forewing straight; pale area of hindwing small, about equal in width to dark marginal band; fringe unicolorous ----- <i>pyrgo</i> (p. 22) | |
| | Inner margin of white costal streak of forewing irregular basally; pale area of hindwing large, about twice width of dark marginal band; fringe of hindwing interrupted with brown at veins, especially at M ₂ , Cu ₁ , and Cu ₂ ----- <i>nutrix</i> (p. 23) | |

¹ *G. soror* (Cramer), an unrecognized species, is not included. In this key the expression "pale area" denotes that area of the hindwing that is a shade of orange or yellow. Unless otherwise stated, the characters of the wings, based on color or pattern, refer to their upper surface.

5. (3) Hindwing completely fuscous or nearly so, pale areas, when present, restricted to inner margin and/or indistinct basal patches ----- 6
 Hindwing with basal half or more pale ----- 8
6. (5) Median part of inner margin of forewing grayish, lighter than remainder of median area of wing ----- 7
 Median part of inner margin of forewing concolorous with median area of wing ----- *syrna* (p. 14)
7. (6) Inner margin of forewing with large tooth immediately basad of median light patch; base of forewing nearly concolorous with median area of wing ----- *separans* (p. 18)
 Inner margin of forewing with small scale tooth immediately basad of median light patch; base of forewing distinctly lighter than dark median area of wing ----- *sinaldus* (p. 15)
8. (5) Inner margin of forewing with a tooth or scale tooth just basad of middle and/or grayish median patch ----- 10
 Inner margin of forewing concolorous and lacking tooth or scale tooth near middle ----- 9
9. (8) Distal area of forewing distinctly lighter in color than median part of wing, the two areas separated by thin, straight, brassy-yellow line ----- *syrna* (p. 14)
 Distal area of forewing concolorous with median area of wing, lines convex, brick red, and alternate with rows of indistinct black points ----- *sicheas* (p. 13)
10. (8) Emargination of inner margin of forewing about as deep as wide ----- *distincta* (p. 20)
 Emargination of inner margin of forewing at least twice as wide as deep ----- 11
11. (10) Inner margin of forewing with grayish median patch; head more or less concolorous with thorax ----- 13
 Inner margin of forewing lacking grayish patch medially; head distinctly lighter in color than thorax ----- 12
12. (11) Scale tooth near middle of inner margin of forewing small; palpi fuscous ----- *holosericea* (p. 11)
 Scale tooth near middle of inner margin of forewing large; palpi gray ----- *mexicana* (p. 12)
13. (11) Forewing with large tooth just basad of middle of inner margin ----- 14
 Forewing with only small scale tooth near middle of inner margin ----- 15
14. (13) From continental Neotropical region (México to Argentina) ----- *biarmata biarmata* (p. 19)
 From Galápagos Islands ----- *biarmata galapagensis* (p. 20)
15. (13) Median area of forewing metal bronze in color; dark marginal band of hindwing strongly tapered to point near anal angle, greatest width of band less than one-third length of wing ----- *lecha* (p. 18)
 Median area of forewing rich dark brown; dark marginal band of hindwing only moderately tapered, usually truncate near anal angle, greatest width of band one-third or more length of wing ----- 16
16. (15) White postmedial line of forewing extending basad along anal vein, separating dark brown of median area from lighter brown patch before tornus ----- *indentata* (p. 17)
 White postmedial line of forewing not extending basad along anal vein, dark brown of median area extending into tornus ----- *sinaldus* (p. 15)
17. (2) Front of head distinctly lighter than thorax ----- 24
 Front of head more or less concolorous with thorax ----- 18
18. (17) Hindwing completely dark ----- 19
 Hindwing with median pale area ----- 21
19. (18) Tornus of forewing orange or yellowish orange, lighter in color than remainder of wing ----- 20

- Tornus of forewing dull yellowish brown, not distinctly lighter than remainder of wing ----- *aequalis* (p. 30)
20. (19) Antemedial line prominent; median area of forewing suffused with opalescent scales; an irregular, transverse, brassy-yellow line distad of postmedial line ----- *chorinea* (p. 28)
- Antemedial line indistinct; median area of forewing lacking suffusion of opalescent scales; a series of alternating dark and light, slightly convex lines distad of postmedial line ----- *fulvidens* (p. 29)
21. (18) Transverse lines of forewing indistinct between fold and costa; pale area of hindwing about one-half as wide as dark area of inner margin of wing ----- *sitia* (p. 36)
- Transverse lines of forewing distinct between fold and costa; pale area of hindwing wider than dark area of inner margin of wing, or if less wide, only slightly so ----- 22
22. (21) Reniform of two small white spots; inner margin of underside of hindwing concolorous with pale median area --- *lineus* (p. 25)
- Reniform indistinct, of normal shape, brown, paler around edge; inner margin of underside of hindwing dark, not concolorous with pale median area ----- 23
23. (22) Forewing with dark spot on and about subterminal part of vein M_2 , extending basad toward postmedial line; adterminal line caudad of dark spot brown ----- *uzoria* (p. 26)
- Forewing with area on and about subterminal part of vein M_2 pale; adterminal line black, very prominently marked on veins M_1 and Cu_1 ----- *fernandezii* (p. 28)
24. (17) Pale area of hindwing present, distinct ----- 25
- Pale area of hindwing absent or very indistinct ----- 36
25. (24) Dorsum of abdomen completely orange, or orange with a series of spots or narrow longitudinal band of fuscous; upper surface of hindwing with a series of diffuse spots or narrow submarginal band; lower surface of hindwing entirely pale ----- *unica* (p. 41)
- Dorsum of abdomen entirely dark or with orange only at end; hindwing with at least some black or dark brown below and with wide dark marginal band above ----- 26
26. (25) Pale area of hindwing usually twice or more width of dark area of inner margin; median area of forewing darker than apical area ----- *correcta* (p. 34)
- Pale area of hindwing not twice as wide as dark area of inner margin, or if so, median area of forewing lighter than apical part of wing ----- 27
27. (26) Median area of forewing largely straw yellow or with poorly defined streak of straw yellow extending from basal area above fold to costa above reniform ----- 28
- Median area of forewing without straw-yellow coloration, or if present, not located as indicated above ----- 29
28. (27) Outer line of postmedial band of forewing convex distally; tornus more or less concolorous with median area of wing; antemedial band of forewing appearing in area of fold as pair of short, thin, parallel, white lines ----- *primulina* (p. 49)
- Outer line of postmedial band of forewing directly transverse, nearly straight; tornus not concolorous with median area of forewing; antemedial band of forewing appearing in area of fold as single, brick-red, oblique line bordered basally by faint opalescent scaling ----- *latimacula* (p. 48)
29. (27) Area of forewing basad of antemedial band distinctly lighter in coloration than median area of wing; vein Cu_1 of forewing not darkly colored ----- 30
- Area of forewing basad of antemedial band not distinctly lighter than median area of wing, or if so, vein Cu_1 of forewing darkly colored with brick red between antemedial and postmedial bands ----- 32

30. (29) Ventral surface of hindwing with area along inner margin yellow ----- 31
 Ventral surface of hindwing with area along inner margin fuscous ----- *bidens tenebrosa* (p. 40)
31. (30) Dark marginal band of ventral surface of hindwing extending into area between vein Sc and costal margin; that part of fringe of ventral surface of hindwing between veins M₂ and Cu₂ dark in color ----- *bidens meridionalis* (p. 39)
 Dark marginal band of ventral surface of hindwing not extending into area between vein Sc and costa; fringe between M₂ and Cu₂ of ventral surface of hindwing pale in color ----- *bidens bidens* (p. 38)
32. (29) Orange coloration of tornus of forewing produced into diffuse transverse band parallel to and distad of postmedial band ----- *fulvargula* (p. 42)
 Coloration of tornus not orange, or if so, not produced into diffuse transverse band as above ----- 33
33. (32) Postmedial band of forewing composed of fine, straight, blue line bordered on either side with broader lines of fuscous; postmedial band reaching costa at about one-third length of wing from apex ----- *maria* (p. 35)
 Postmedial band not as above, reaching costa at about one-fourth length of wing from apex or less ----- 34
34. (33) Veins of forewing in median area of wing, basad from postmedial band, darkly colored ----- 35
 Veins of forewing concolorous with adjacent areas of wing ----- *clotilda* (p. 36)
35. (34) Pale area of hindwing well developed; forewing with grayish (brassy yellow in certain aspects) transverse band immediately distad of postmedial band ----- *nitidimacula* (p. 47)
 Pale area of hindwing partly suffused with fuscous; forewing without grayish band as above, but with reddish striae between veins basad of postmedial line ----- *incurva* (p. 45)
36. (24) Posterior area of forewing from just before fold to inner margin suffused with gray, lighter than anterior part of wing; a transverse series of small whitish points immediately distad of postmedial band ----- *pulverea* (p. 32)
 Posterior area of forewing not distinctly lighter than anterior part; without a transverse series of small whitish points distad of postmedial band ----- 37
37. (36) Fold of forewing distinctly lighter in coloration than contiguous areas of wing ----- 38
 Fold of forewing unicolorous with contiguous areas of wing ----- 41
38. (37) Vein Cu₂ of forewing reddish brown, darker than contiguous areas of wing ----- 39
 Vein Cu₂ of forewing concolorous with contiguous areas of wing ----- 40
39. (38) Forewing with short, oblique, white line in fold above scale tooth of inner margin; outer margin of forewing lacking small black dot in fold; length of forewing about 20 mm. ----- *walkeri* (p. 43)
 Forewing without short, oblique, white line in fold above scale tooth; outer margin of forewing with small black dot in fold; a smaller species, length of forewing about 15 mm. ----- *pseudamianta* (p. 44)
40. (38) Lines of antemedial band of forewing much darker between fold and inner margin than between fold and costa ----- *paraequalis* (p. 31)
 Lines of antemedial band not darker between fold and inner margin of wing ----- *immacula* (p. 33)
41. (37) Lines of antemedial band of forewing between fold and inner margin parallel with costa ----- 42
 Lines of antemedial band of forewing between fold and inner margin transverse or slightly oblique ----- 43

42. (41) Tornus of forewing yellowish; veins and spaces between veins marked with longitudinal reddish-brown striae -- *incurva* (p. 45)
 Tornus of forewing brown with small median white spot; veins and spaces between veins without reddish-brown striae ----
 ----- *parens* (p. 32)
43. (41) Distal line of postmedial band followed by minutely waved opalescent line, which in turn is bordered by dark-brown line
 ----- *amianta* (p. 44)
 Distal line of postmedial band followed by a series of small brassy-colored crescents or angular marks ---- *immacula* (p. 33)

THE SPECIES OF GONODONTA

Gonodonta ditissima Walker(Pls. 1, *F*; 6, *D*; 7, *X*; 10, *E-G*)

Gonodonta ditissima Walker, 1858, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 15, p. 1790.

This species is easily distinguished from all other species of the genus by the absence of a tooth at the tornus of the forewing and by the distinctive male and female genitalia. (See pls. 7, *X*; 10, *E-G*.) *G. ditissima* is illustrated in color in Seitz ([1919-46], pl. 90 [1940-46], row *i*) as "recta." Length of forewing: Male, 19 to 25 mm.; female, 22 to 25 mm.

Type.—In the British Museum (Natural History).

Type locality.—"Rio de Janeiro."

Food plant.—Unknown.

Distribution.—Twenty-three specimens from the following localities have been examined: PANAMÁ. *Canal Zone*: Barro Colorado Island. VENEZUELA. *Carabobo*: Las Quiguas, San Esteban Valley; Valle del Río Borburata. *Aragua*: Rancho Grande. *Bolívar*: Route El Dorado-Santa Elena, Km. 38. BRASIL. *Distrito Federal*: Rio de Janeiro. *Santa Catarina*: "St. Catherine's." *Espirito Santo*: "Espírito Santo."

Method of determination.—A specimen identified from the original description was compared with the type by D. S. Fletcher.

Gonodonta holosericea Guénéé(Pls. 1, *I*; 6, *G*; 7, *O*; 10, *A-B*; 12, *D*)

Gonodonta holosericea Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 371. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 954. — Druce, 1887, in Godman and Salvin, Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 256. — Dognin, 1894, Lépidoptères de Loja et Environs (Equateur), pt. 3, p. 73. — Schaus, 1896, Ent. News 7: 8; 1901, Ann. and Mag. Nat. Hist., Ser. 7, 8: 90.

This large species of the *sicheas* group is similar to *mexicana*. They both differ from the other species of this group by the following combination of characters: Tooth at tornus, front of head lighter in color than thorax, and apex of second segment of labial palpus not tufted ventrally. *G. holosericea* may be separated from *mexicana* by the size of the scale tooth of the inner margin of the forewing (small in *holosericea* and large in *mexicana*); by the

presence of a thin, black subterminal line on the forewing; by the much darker, nearly black, median area of the forewing, thorax, and palpi; and by the characteristic male and female genitalia. (See pls. 7, O; 10, A-B; 12, D.) This species is illustrated in color in Seitz ([1919-46], pl. 90 [1940-46], row e) as "holosericea." The illustration is rather poor, especially the coloration of the thorax, the details of maculation, and the coloration of the distal part of the forewing. Length of forewing: Male, 19 to 21 mm.; female, 21 to 25 mm.

Type.—D. S. Fletcher has selected and labeled one of the syntypes, a female, as the lectotype. In addition to the lectotype label, the specimen is labeled "holosericea Gn. Sp. 1222, Colombie." The lectotype is in the British Museum (Natural History).

Type locality.—As indicated above.

Food plant.—Unknown.

Distribution.—Forty-five specimens from the following localities have been examined: GUATEMALA. *Izabal*: Cayuga. COSTA RICA. *Cartago*: Juan Viñas. PANAMÁ. *Canal Zone*: Barro Colorado Island. COLOMBIA. *Boyacá*: Muzo. VENEZUELA. *Yaracuy*: Aroa. *Aragua*: Rancho Grande; Route Maracay-Choroní, Km. 25. *Carabobo*: Valle del Río Borburata. *Distrito Federal*: Route Caracas-Colonia Tovar, Km. 22. *Lara*: Terepaima. BOLIVIA. *Cochabamba*: Cochabamba.

Method of determination.—A specimen identified by means of the original description was compared with the lectotype candidate in the British Museum (Natural History) by D. S. Fletcher.

Gonodonta mexicana Schaus

(Pls. 1, J; 7, W; 9, E-F; 11, E)

Gonodonta mexicana Schaus, 1901, Ann. and Mag. Nat. Hist., Ser. 7, 8: 90.

G. mexicana is similar to *holosericea*, as indicated in the description of that species (p. 11), but it may be readily distinguished from the latter by the lighter coloration (metal bronze) of the median area of the forewing, by the presence of a large scale tooth (wider than tooth at tornus) of the inner margin of the forewing, by the absence of a black subterminal line of the forewing, by the presence of a black-margined, blue-centered, subtriangular spot in the anal fold above the tornus of the forewing, by the grayish-brown thorax and palpi, by the pale fringe of the hindwing, and by the distinct male and female genitalia. (See pls. 7, W; 9, E-F; 11, E.) This species is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row e) as "mexicana." Length of forewing: Male, 19 to 20 mm.; female, 22 to 24 mm.

Type.—In the United States National Museum.

Type locality.—Jalapa, México.

Food plant.—Unknown.

Distribution.—Twenty-nine specimens from the following localities have been examined: MÉXICO. *Veracruz*: Jalapa. COSTA RICA. *Cartago*: Juan Viñas. ECUADOR. *Loja*: Environs de Loja. BOLIVIA. *Cochabamba*: Incachaca; Cochabamba. BRASIL.

Santa Catarina: "St. Catherines." VENEZUELA. *Distrito Federal*: El Junquito.

Method of determination.—By examination of the type.

Gonodonta sicheas (Cramer)

(Pls. 1, E; 7, P; 8, C-D; 11, D)

- Phal.[aena] Noct.[ua] sicheas* Cramer, 1777, De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America (Papillons Exotiques, des Trois Parties du Monde, l'Asie, l'Afrique et l'Amérique), v. 2, pp. 86, 150 [index], pl. 150, fig. E.
- Gonodonta sicheas* (Cramer). — Hübner, 1818, Beiträge zur Sammlung Exotischer Schmettlinge [sic], Erstes Hundert, p. 11; 1823, Verzeichniss Bekannter Schmettlinge [sic], p. 263. — Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 372. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 950.
- Phalaena Noctua hesione* Drury, 1782, Illustrations of Natural History, v. 3, p. 29, pl. 22. [New synonymy.]
- Noctua? hesione* Drury. — Westwood, 1837, Illustrations of Exotic Entomology, v. 3, p. 30, [facsimile of Drury's "Illustrations of Natural History" with text changes and additional comments by Westwood].
- Gonodonta hesione* (Drury). — Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 372. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 954. — Lucas, 1857, in Guérin-Méneville, Animaux Articulés (v. 7 of Histoire Physique, Politique et Naturelle de l'île de Cuba by Ramon de la Sagra), p. 728. — Herrich-Schäffer, 1868, Corresp.-Blatt Zool.-Min. Ver. Regensburg (Naturw. Ver. Regensburg) 22: 185. — Gundlach, 1881, Contribución á la Entomología Cubana, Lepidopteros, v. 1, p. 336. — Druce, 1887, in Godman and Salvin, Biología Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 256. — Müschler, 1890, Senckenb. Naturf. Gesell. Abhandl. 16: 183. — Gundlach, 1891, Soc. Españ. de Hist. Nat. Ann. 20: 189. — Wolcott, 1924, Porto Rico Dept. Agr. Jour. 7: 176. — Schaus, 1940, Scientific Survey of Porto Rico and the Virgin Islands, v. 12, pt. 2, p. 259. — Wolcott, (1948) 1951, Puerto Rico Univ. Jour. Agr. 32: 617.
- Gonodonta unica* Hübner, 1818, Beiträge zur Sammlung Exotischer Schmettlinge [sic], Erstes Hundert, p. 11; 1823, Verzeichniss Bekannter Schmettlinge [sic], p. 263. — Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 372, [as synonym of *hesione*].

This species agrees with *synna*, in that the tooth or scale tooth is absent near the middle of the inner margin of the forewing. The other species of the *sicheas* group that agree with *sicheas* in that the front of the head is more or less concolorous with the thorax have the inner margin of the forewing with a tooth or scale tooth near the middle. *G. sicheas* may be separated from *synna* by the presence of brick-red convex lines on the forewing, by the concolorous ground of the apical and median areas of the forewing, and by the distinctive male and female genitalia. (See pls. 7, P; 8, C-D; and 11, D.) In addition to the illustrations noted in the specific bibliography, this species is illustrated in color in Seitz ([1919-46], pl. 90 [1940-46], row i) as "unica." Length of forewing: Male, 16 to 19 mm.; female, 20 to 23 mm.

Types.—There are two specimens, a male and a female, in the Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands, from the original Stoll collection. The female has a round, neatly writ-

ten label "Bescke"; the male bears a similar but rectangular and less neat label. I select the male to be the lectotype of *Phal. [aena] Noct. [ua] sicheas* Cramer. The type of *Phalaena Noctua hesione* Drury is apparently lost, or at least the specimen has not been recognized. The types of Drury are supposed to be in the collection of the British Museum (Natural History), but several searches have failed to reveal the material. According to Horn and Kahle (1935, p. 119), the types of lepidopterous species described by Jacob Hübner are in the Naturhistorisches Museum in Vienna, Austria. I have not been able to learn whether the type of *uncina* is in that collection.

Type localities.—The lectotype of *sicheas* is from Surinam. The specimens from which *hesione* and *uncina* were described were from Brasil.

Food plant.—Unknown.

Distribution.—A total of 208 specimens have been examined. They are from the following localities: MÉXICO. Veracruz: Jalapa; Orizaba; Córdoba; Presidio. Puebla: Puebla. GUATEMALA. Izabal: Cayuga. HONDURAS. Atlántida: Tela. COSTA RICA. Cartago: Turrialba. Limón: Guápiles; Río Sixaola. "Avangarez." PANAMÁ. Canal Zone: Barro Colorado Island; Tabernilla. Chiriquí: "Chiriquí." ECUADOR. "Chuchuras." PERÚ. Huánuco: Tingo María. BOLIVIA. Cochabamba: Cochabamba; Río Christalmayo. ARGENTINA. Tucumán: Tucumán. PARAGUAY. "Paraguay." BRASIL. Rio Grande do Sul: Pelotas. Santa Catarina: Neu Bremen; Jaraguá; "St. Catherines." Pará: Belém; Santarém. São Paulo: Serrado. Espírito Santo: "Espírito Santo." "Brazil." SURINAM. Moengo, Boven Cottica Rivier. BRITISH GUIANA. Essequibo: Tumatumari, Potaro River. VENEZUELA. Yaracuy: Aroa. Aragua: Route Maracay-Choroní; Ranch Grande; El Castano, "cr." Maracay. Bolívar: Suapure, Río Caura; Route El Dorado-Santa Elena, Km. 107. Mérida: Mérida. Trujillo: La Puerta. Carabobo: Valle del Río Borburata; Las Quiguas. Distrito Federal: Caracas; Caracas-Colonia Tovar, Km. 16.5. TRINIDAD. "Trinidad." PUERTO RICO. Bayamon; Yauco-Lares Road, Km. 29. JAMAICA. May Hill; Constant Spring; Greenhills, Hardwar Gap; Mandeville, Manchester. CUBA. Habana: Habana; vicinity of Habana; Santiago de las Vegas. Pinar del Río: Sierra Rangel. Camaguey: Limones. Oriente: Baracoa; south side of Pico Turquino. Las Villas: San Blas. Matanzas: Matanzas. "Cuba." FLORIDA. Palm Beach County: Belle Glade.

Method of determination.—A specimen was identified by means of the original descriptions and the illustrations accompanying them. A specimen so determined has also been compared with one of the lectotype candidates of *sicheas*.

Gonodonta syrna Guénéé

(Pls. I, G-H; 6, C; 7, S; 9, C-D; 12, E)

Gonodonta syrna Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuelites II), p. 371. — Walker, 1857,

List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 955. — Möschler, 1880, Zool.-Bot. Gesell. Wien, Verhandl. 30: 393.

G. syrna can be separated from all the other species of the *sicheas* group, except *sicheas*, by the absence of a tooth or scale tooth near the middle of the inner margin of the forewing, the concolorous nature of the inner margin and the median part of the forewing, and the concolorous nature of the head and thorax. It can be distinguished from *sicheas* by the distal area of the forewing, which is distinctly lighter in color than the median part and separated from that area by a thin, straight, transverse, brassy-yellow line. *G. syrna* has the forewing more acuminate than any other species, especially in the males. The male and female genitalia (see pis. 7, S; 9, C-D; 12, E) are distinctly different from those of the other species of the genus. There is considerable variation in the coloration of the upper surface of the hindwing. Some specimens have a well-developed pale area; others have the hindwing completely fuscous or nearly so. This species is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row i) as "janeira." Length of forewing: Male, 20 to 22 mm.; female, 19 to 23 mm.

Type.—In the British Museum (Natural History).

Type locality.—"Cayenne" (French Guiana).

Food plant.—Unknown.

Distribution.—Ninety-two specimens from the following localities have been examined: GUATEMALA. *Izabal*: Cayuga. *Escuintla*: Escuintla. HONDURAS. *Atlántida*: Tela. PANAMÁ. *Canal Zone*: Barro Colorado Island. BOLIVIA. *Cochabamba*: Cochabamba. BRASIL. *Santa Catarina*: Jaraguá. *São Paulo*: São Paulo. *Pará*: Belém. *Rio de Janeiro*: Therezópolis; Itatiaia. *Amazonas*: Monte Cristo, Rio Tapajós; Miracema, Rio Purús; Nova Olinda, Rio Purús. "Brazil." FRENCH GUIANA. Cayenne. BRITISH GUIANA. *Essequibo*: Tumatumari, Potaro River; Omai. VENEZUELA. *Yaracuy*: Aroa. *Carabobo*: Las Quiguas, San Esteban Valley; Valle del Río Borburata. *Mérida*: Mérida. *Aragua*: Rancho Grande. *Bolívar*: Guayaraca Mountain, Auyantepui; Route El Dorado-Santa Elena, Km. 106.

Method of determination.—A specimen identified from the original description was compared with the type by D. S. Fletcher.

Gonodonta sinaldus Guénéé

(Pls. 2, C-D; 6, B; 7, U; 9, A-B; 12, A)

Gonodonta sinaldus Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuelites II), p. 372. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 954. — Druce, 1887, in Godman and Salvin, Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 256. — Dognin, 1891, Lépidoptères de Loja et Environs (Equateur), pt. 2, p. 40. — Schaus, 1896, Ent. News 7: 8.

Gonodonta ginaldus Guénéé, Dyar nec Guénéé, 1914, U. S. Natl. Mus. Proc. 47: 203, [misspelling of *sinaldus* Guénéé].

This is one of the most abundant and most variable species of the genus. It is closely related to *lecha* and to *indentata*, with

which it has been confused in collections. In addition to the group characters of the *sicheas* group, all three species have the head concolorous with the thorax, the median area of the inner margin of the forewing with a gray patch, and a small scale tooth on the inner margin immediately basad of the light patch. On characters of maculation of the forewing, *sinaldus* is easily distinguished from *indentata*, because the thin postmedial line does not extend basad along the anal vein and the dark coloration of the median area extends into the area of the tornus. The differences in maculation between *sinaldus* and *lecha* are more subtle but sufficient to separate the two species. In *sinaldus* the median part of the forewing is dark chocolate brown, but in *lecha* it is much lighter and metal bronze in color. The postmedial line in *sinaldus* is extremely variable, but usually sinuous and often bent basad between M_2 and the anal fold; in *lecha* the postmedial line is straight and terminates in a weak black crescent in the anal fold. The light costal streak is usually concolorous with the distal part of the forewing in *sinaldus*, but in *lecha* it is white and much lighter than the distal part of the wing. The dark marginal band of the hindwing is wider in *sinaldus* than in *lecha*. In the former the greatest width of the band is one-third or more (hindwing completely fuscous in some specimens) the length of the wing, and the band ends bluntly before the anal angle. In *lecha* the greatest width of the marginal band is about one-fourth the length of the wing, and the band tapers to a thin point before the anal angle. The male and female genitalia are distinctive. (See pls. 7, U; 9, A-B; and 12, A.) *G. sinaldus* is illustrated in color in Seitz ([1919-46], pl. 90 [1940-46], row e) as "*sinaldus*" and as "*lecha*." Length of forewing: Male, 15 to 19 mm.; female, 16 to 22 mm.

Type.—D. S. Fletcher has selected a male syntype in the British Museum (Natural History) as the lectotype of this species. In addition to the lectotype label applied by Fletcher, this specimen is labeled as follows: "Gonodonta Sinaldus Gn. Colombie No. 1 Envoi Dbday."

Type locality.—"Colombie."

Food plant.—Unknown.

Distribution.—Three hundred and two specimens have been examined. They are from the following localities: MEXICO. *Chiapas*: La Granja. *Veracruz*: Córdoba; Jalapa; Orizaba; Jicaltepec; Paso San Juan; "Mozorongo" [Motzorongo (?)]. "Fstino" [Faustinos, Estado de Chihuahua (?)]. "Jacala" [Estado de Hidalgo (?)]. (GUATEMALA. *Izabal*: Cayuga. *Baja Verapaz*: Chejel. *Sololá*: "Olas de Moka" [Mocá (?)]. HONDURAS. *Atlántida*: Tela. COSTA RICA. *Cartago*: Juan Viñas; Tuis. *Limón*: Río Banana [Río Banano (?)]; Guápiles; Río Sixaola. *San José*: San José. "Avangarez." "Costa Rica." PANAMÁ. *Canal Zone*: Barro Colorado Island. *Chiriquí*: "Chiriqui." COLOMBIA. *Cauca*: Popayán. ECUADOR. *Loja*: Loja. *Napo-Pastaza*: Jatúnycu. "Pacific Slope." PERÚ. *Huánuco*:

Tingo María. "Perú." BOLIVIA. *Cochabamba*: Incachaca; Cocha-bamba. BRASIL. *Rio Grande do Sul*: Guarani. *Santa Catarina*: Hansa Humbolt; Jaraguá; Neu Bremen; "St. Catherines." *São Paulo*: Alto da Serro; São Paulo. *Distrito Federal*: Rio de Janeiro. *Espírito Santo*: "Espírito Santo." *Mato Grosso*: Chapada, near Cuiabá. *Amazonas*: Monte Christo, Rio Tapajós; Nova Olinda, Rio Purús; Tefé. "Canta Gallo." BRITISH GUIANA. *Essequibo*: Kartabo; Rupununi River; Tumatumari, Potaro River. VENEZUELA. *Yaracuy*: Aroa. *Aragua*: Maracay; Rancho Grande; Route Maracay-Choroní; Route Maracay-Ocumare de las Costa; Guiripa-San Casimiro. *Distrito Federal*: El Junquito; Massif du Naiguatá; Route Caracas-Colonia Tovar; Serranía, El Avila; Caracas. *Carabobo*: Las Quiguas, San Esteban Valley; Valle del Río Borburata. *Miranda*: San Antonio, near Los Teques; Laguna Tacarigua. *Trujillo*: Valera. *Bolívar*: Route El Dorado-Santa Elena, Kms. 38, 106, and 107. *Territorio Federal Amazonas*: Yavita. TRINIDAD. "Trinidad."

Method of determination.—A specimen agreeing with the original description was sent to D. S. Fletcher, who compared it with the specimen selected as the lectotype.

Gonodonta indentata (Hampson), new combination

(Pls. 2, A; 7, R; 9, I; 12, C)

Athysania indentata Hampson, 1926, *New Genera and Species of Noctuidae* in the British Museum, p. 371.

This species resembles *sinuldus*, from which it may be distinguished by the shape of the postmedial line, which is bent basad along the anal vein and thus separates the rich reddish brown of the median area of the forewing from the brown of the tornus; by the presence of a small black spot on the base of the collar immediately above and behind the eye; and by the distinctive male and female genitalia. (See pls. 7, R; 9, I; 12, C.) Length of forewing: Male, 14 to 16 mm.; female, 16 to 18 mm.

Type.—In the British Museum (Natural History).

Type locality.—Las Quiguas, San Esteban Valley, Carabobo, Venezuela.

Food plant.—Unknown.

Distribution.—Thirty-four specimens have been examined: They are from the following localities: COSTA RICA. *Cartago*: Orosi, Volcán Irazú. PANAMÁ. *Canal Zone*: Barro Colorado Island. *Coclé*: La Venta. VENEZUELA. *Carabobo*: Las Quiguas, San Esteban Valley; Valle del Río Borburata. *Aragua*: Rancho Grande. *Bolívar*: Route El Dorado-Santa Elena, Km. 106. BRITISH GUIANA. *Essequibo*: Kartabo; Ormai; Tumatumari, Potaro River. BRASIL. *Amazonas*: Tefé; San Antonio, Rio Madeira; Hyutanahan, Rio Purús. *Santa Catarina*: Neu Bremen. BOLIVIA. *Cochabamba*: Cochabamba; Rio Christalmayo.

Method of determination.—A specimen agreeing with the original description was compared with the type by D. S. Fletcher.

Gonodonta lecha Schaus

(Pls. 1, B; 7, N; 9, G-H; 11, F)

Gonodonta lecha Schaus, 1911, Ann. and Mag. Nat. Hist., Ser. 8, 7: 84.

G. lecha is closely related to *sinaldus*, from which it may be separated most readily by the bronze color of the median part of the forewing (not dark chocolate brown as in *sinaldus*), by the narrower marginal band of the hindwing, and by the male and female genitalia. (See pls. 7, N; 9, G-H; 11, F.) The illustration in Seitz ([1919-40], pl. 90 [1940-46], row e) over the name "lecha" is not this species; it is an illustration of *sinaldus*. Length of forewing: Male, 16 to 17 mm.; female, 18 to 19 mm.

Type.—In the United States National Museum.

Food plant.—Unknown.

Distribution.—Only 10 specimens of this species have been studied. They are from the following localities: GUATEMALA. *Izabal*: Cayuga. HONDURAS. *Cortés*: San Pedro Sula. COSTA RICA. "Avangarez." PANAMA. *Canal Zone*: Barro Colorado Island. *Chiriquí*: "Chiriquí." VENEZUELA. *Carabobo*: Las Quiguas, San Esteban Valley. *Trujillo*: Valera. *Aragua*: Rancho Grande.

Method of determination.—Study of the type.

Gonodonta separans Walker

(Pls. 5, F; 7, T; 8, A-B)

Gonodonta separans Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 956.

This species resembles slightly those specimens of *sinaldus* that have the hindwings mostly fuscous, but it may be separated from them by the presence of a large tooth on the inner margin of the forewing basad of the median light patch, by the bronze coloration of the median area of the forewing, and by the small light patch of the inner margin of the forewing, which is only slightly wider than long. *G. separans* agrees with two other species, *biarmata* and *distincta*, in having a large tooth on the inner margin of the forewing, but it may be readily separated from both by the absence of a distinct pale area on the hindwing and by the very distinct male genitalia. (See pls. 7, T; 8, A-B.) Length of forewing: Male, 17 mm.

Type.—In the British Museum (Natural History).

Type locality.—"Ega." This locality, now known as Tefé, is in Amazonas, Brasil.

Food plant.—Unknown.

Distribution.—Known only from the type locality.

Method of determination.—Walker had only the type before him when describing the species, but D. S. Fletcher has discovered a second specimen in the collection of the British Museum (Natural History). The latter, a male, agrees with the type, and it is identically labeled and similarly prepared. I have examined this specimen.

Gonodonta biarmata biarmata Guénéé

(Pls. 1, C; 6, E; 7, M; 8, I-J; 11, C)

Gonodonta biarmata Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuelites II), p. 373. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 955.

Gonodonta evadens Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 955. — Mabilde, 1896, Guia Practica para os Principiantes Colleccionadores de Insectos, p. 207. [New synonymy.]

Gonodonta elegans Druce, 1889, in Godman and Salvin, Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 76, p. 257; v. 3, table 26, fig. 1. — Dognin, 1891, Lépidoptères de Loja et Environs (Équateur), pt. 2, p. 40. — Schaus, 1923, Zoologica 5: 27.

In general habitus and coloration this species bears some resemblance to *lecha*, but the presence of a large tooth on the inner margin of the forewing immediately basad of the middle readily distinguishes *biarmata* from *lecha* and from all other species of the *sicheas* group, except *separans*. *G. b. biarmata* may be separated from *separans* by the presence of a pale area on the hindwing and by the distinctive male genitalia. (See pls. 7, M; 8, I-J.) *G. b. biarmata* is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row h) as "hesione." Length of forewing: Male, 17 to 20 mm.; female, 18 to 22 mm.

Types.—This species was originally described from four specimens from "Nouvelle-Fribourg (Bresil)." D. S. Fletcher has selected and labeled one of them, a male, as the lectotype. In addition to the lectotype label, the specimen is labeled as follows: "Gonodonta biarmata Gn. Nlle. fribourg au bresil envoi Berke." The specimens of *elegans* and *evadens*, which were labeled as types by the authors, are also in the British Museum (Natural History). They have been selected and labeled lectotypes by Fletcher.

Type localities.—The lectotype of *biarmata* is from "Nouvelle-Fribourg (Bresil)," that of *evadens* is from the "West coast of America," and that of *elegans* is from San Geronimo, Guatemala.

Food plants.—Mabilde (1896, p. 208) stated that the larva is found on various climbing vines of ordinary lianas, as well as on "*coirana*" [species of the genera *Solanum* or *Cestrum* (?)].

Distribution.—Thirty-four specimens of the nominate subspecies have been examined. They are from the following localities: MEXICO. Veracruz: Coatepec; Jalapa. Chiapas: Mountains, near Soconusco; La Florida. "Mexico." GUATEMALA. Baja Verapaz: Chejel. COSTA RICA. Cartago: Juan Viñas. PERÚ. Puno: Río Huacamaya, Carabaya; Tinguri, Carabaya. BOLIVIA. Cochabamba: Cochabamba. ARGENTINA. Tucumán: Tucumán. URUGUAY. "Uruguay." BRASIL. Santa Catarina: Joinville; Jaraguá; Neu Bremen. Distrito Federal: Rio de Janeiro. Paraná: Castro; Ponta Grossa. Minas Gerais: Vicosá. Rio Grande do Sul: Pelotas. "Prov. Rio." VENEZUELA. Mérida: Mérida. Miranda: San Antonio, near Los Teques.

Method of determination.—A specimen agreeing with the

original description of *biarmata* was compared with the specimen selected as the lectotype. *G. elegans* is easily identified by means of the illustration. The identity of *evadens* was determined by examining a syntype from the British Museum (Natural History).

Remarks.—The two specimens of *evadens* in the British Museum are larger and darker than most specimens of the nominate subspecies and have some suffusion of pale cinereous coloration on the forewing. Because of the pale cinereous coloration of the forewing, they resemble, to some extent, specimens of *biarmata galapagensis*.

Gonodonta biarmata galapagensis, new subspecies

Gonodonta biarmata Guénee. — Schaus, 1923, *Zoologica* 5: 27. — Richards, 1941, *Allan Hancock Pacific Expeditions*, v. 5, No. 6, p. 242.

This subspecies is similar to the nominate subspecies, but the forewing, especially the anterior half, is suffused with pale cinereous coloration, and the pale area of the hindwing is less yellow. In the females there is some suffusion of fuscous over the pale area of the hindwing, but the amount varies with the specimen. Length of forewing: Male, 17 to 19 mm.; female, 19 to 22 mm.

Type.—Type, male, Indefatigable Island, Galápagos, accession No. 30440, male genitalia slide No. 284, E. L. Todd; 6 male paratypes, same locality and accession number; 2 male paratypes, same place, January 7, 1936, W. von Hagen, accession No. 34358; 2 male paratypes, same data except January 8, 1936; 1 female paratype, same data except January 10, 1936; 2 male paratypes, Santa Cruz Island, Galápagos, November 7, 1935, W. von Hagen, accession No. 34358; in the American Museum of Natural History. One male and one female paratypes, same data as the type in the United States National Museum. One male paratype, same data as the type; 1 female paratype, Chatham Island, Galápagos, June 12, 1923, F. A. Phillips; in the British Museum (Natural History).

Food plant.—Unknown.

Distribution.—This subspecies is restricted to the Galápagos Islands. The specimen examined by Schaus was from Conway Bay, Indefatigable Island, Richards' material was from Charles Island, and the specimens I examined were from Indefatigable, Santa Cruz, and Chatham Islands.

Gonodonta distincta, new species

(Pls. 1, *D*; 7, *V*; 10, *C-D*; 11, *A*)

Vestiture of head, palpi, and thorax concolorous, light brown; apices of tegulae, ventral part of palpi, and metathoracic tuft darker. Outer margin of forewing rather truncate; inner margin very short, tooth at tornus directly behind reniform spot, excavation of inner margin only slightly wider than long; silvery-white basal line prominent on anterior half of wing, excurved level with cell, bent distad at costa and extending along costa to or beyond postmedial line; median area of wing bronze, extending into tornus; reniform indistinct, mainly small, round, dark-brown

point, but with indications of other paler brown marks; postmedial band composed of series of straight or slightly convex, bronze and brassy-yellow lines extending from outer third of costa to point on outer margin immediately caudad of anal fold; distal part of wing pale brown without obvious maculation, except for two series of indistinct points on veins, one series just beyond postmedial band, other subterminal, veins lighter in color between points, and dark subterminal point in anal fold; light patch of inner margin of forewing extending from middle of excavation into small but distinct scale tooth. Hindwing with basal three-fifths pale, yellow orange in color; marginal band fuscous, narrowing toward anal angle; outer margin of wing strongly excavated between veins Cu_1 and second A in male, weakly concave in female. Underside of forewing yellowish basally and along costa, fuscous apically. Hindwing beneath mostly yellow but with weak indication of fuscous near apex. Length of forewing: Male, 17 mm.; female, 18 mm.

Male genitalia distinctive. (See pls. 7, V; 10, C-D.) Uncus moderately stout, with prominent apical hook and with weak dorsal and lateral carinae near apex. Valve with apical margin concave, extension of sacculus exceeding apex of valve, enlarged beyond middle and with apex bent mesad and dorsad immediately beyond enlargement. Juxta somewhat bulbous, subpyramidoidal. Aedeagus slender, enlarged distally with transverse row of three small pointed projections on right side of dorsum; vesica small, armed with two clusters of small cornuti.

Female genitalia characteristic. (See pl. 11, A.) Ductus bursae large, well sclerotized; posterior half of bursa copulatrix sclerotized, with longitudinal folds; anterior half of bursa membranous, signum absent; ductus seminalis arising from dorsal surface of posterior end of bursa copulatrix.

Type.—Holotype, female, Las Quiguas, San Esteban Valley, northern Venezuela, November to March 1910, female genitalia slide No. 535, E. L. Todd, in the Carnegie Museum, Pittsburgh, Pa. One female paratype, same locality data as holotype, in the United States National Museum. One male paratype, Valle del Río Borburata, Carabobo, Venezuela, 675 meters, July 1, 1956, René Lichy, in his collection, Caracas, Distrito Federal, Venezuela. One male paratype, Km. 107, Route El Dorado-Santa Elena, Bolívar, Venezuela, August 16, 1957, F. Fernández Yépez and C. J. Rosales, in the collection of the Universidad Central de Venezuela, Maracay, Aragua, Venezuela.

Food plant.—Unknown.

Distribution.—As indicated for the type series.

Remarks.—This species superficially resembles *biarmata*, but the peculiar wing shape and distinctive genitalia immediately distinguish it from that species, as well as from the other known species of the genus.

Gonodonta pyrgo (Cramer)

(Pls. 1, A; 7, Q; 8, G-H; 12, F)

Phal.[acna] Noct.[ua] pyrgo Cramer, 1777, De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America (Papillons Exotiques, des Trois Parties du Monde, l'Asie, l'Afrique et l'Amérique), v. 2, pp. 65, 150 [index], pl. 139, fig. D.

Gonodonta pyrgo (Cramer). — Guénee, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 371. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 953. — Möscher, 1880, Zool.-Bot. Gesell. Wien, Verhandl. 30: 393. — Druce, 1887, in Godman and Salvin, Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 256. — Dognin, 1894, Lépidoptères de Loja et Environs (Équateur), pt. 3, p. 73. — Dyar, 1914, U. S. Natl. Mus. Proc. 47: 203. — Barnes and McDunnough, 1917, Check List of the Lepidoptera of Boreal America, p. 87. — McDunnough, 1938, South. Calif. Acad. Sci. Mem. v. 1, p. 124. — Rihard and Wene, 1955, Kans. Ent. Soc. Jour. 28: 103, 106.

Gonodonta serix Guénee, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 370. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 954, [synonym of *pyrgo* (Cramer)].

G. pyrgo is an abundant, widely distributed species, which is easily identified by the straight inner margin of the white costal streak of the forewing, by the ventrally tufted apex of the second segment of the labial palpus, by the reduced pale area and the pale unicolorous fringe of the hindwing, and by the distinctive male and female genitalia. (See pls. 7, Q; 8, G-H; 12, F.) This species is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row f) as "pyrgo." Length of forewing: Male, 19 to 25 mm.; female, 20 to 27 mm.

Types.—The type of *pyrgo* is apparently lost, at least it is not in the Rijksmuseum van Natuurlijke Historie at Leiden, Netherlands, with other Cramer types. Two of the syntypes of *serix* (Saunders collection) from the Hope Department of Entomology, University Museum, Oxford, England, have been examined by D. S. Fletcher. He has selected and labeled one, a male, "gonodonta Serix Colum. Dys. Sdrs.," as the lectotype.

Type localities.—For *pyrgo*, "Surinam" and for *serix*, "Colombia."

Food plant.—Unknown.

Distribution.—Two hundred and ninety-one specimens have been examined. They are from the following localities: ARIZONA. *Pima County*: Baboquivari Mountains. TEXAS. *Cameron County*: Esper Ranch, near Brownsville. MEXICO. *Veracruz*: Coatepec; Jalapa; Paso de San Juan. *Distrito Federal*: México; San Angel. *Morelos*: Morelos; Cuernavaca; Zacualpan. *Chiapas*: La Granja. GUATEMALA. *Guatemala*: Guatemala. *Baja Verapaz*: Purulha. HONDURAS. *Atlántida*: Lancetilla. TELA. COSTA RICA. *Cartago*: Juan Viñas. *Limón*: Guápiles; Limon. "Avangarez." PANAMÁ. *Canal Zone*: Barro Colorado Island; Balboa. *Chiriquí*: Chiriquí. "Panama." COLOMBIA. *Cundinamarca*: Bogotá; Villavicencio, near Bogotá. "U. S. Columbia." ECUADOR. *Loja*: Loja. PERÚ. "Perú." BOLIVIA. *Cochabamba*: Cochabamba. PARAGUAY. "Paraguay." BRASIL. *Santa Catarina*:

Blumenau; Jaraguá; Neu Bremen. *Paraná*: Castro; Ponta Grossa. *Pará*: Obidos. *Amazonas*: Hyutanahan, Rio Purús. "Brazil." "Amazons." BRITISH GUIANA. *Essequibo*: Omai. "British Guiana." VENEZUELA. *Mérida*: Mérida; Valle "La Mucuy." Sierra Nevada de Mérida. *Yaracuy*: Aroa. *Aragua*: Rancho Grande; El Limón, near Maracay; Maracay; Route Maracay-Ocumare, Km. 22; El Castano, "cr." Maracay. *Carabobo*: Macapo; Valle del Río Borburata. *Miranda*: San Antonio, near Los Teques. *Distrito Federal*: Caracas; Route Caracas-Colonia Tovar, Kms. 16.5-23; Antímano. *Trujillo*: Carvajal. *Bolívar*: Route El Dorado-Santa Elena, Km. 107.

Method of determination.—This species has been identified by means of the original description and the accompanying illustration. A specimen thus determined was compared by D. S. Fletcher with the specimen selected as the lectotype of *serix*.

Remarks.—James Zetek observed adults of *pyrgo* piercing citrus in Panamá in 1940 and also several species of other genera injuring the fruit. He stated⁵ that oranges and grapefruit were damaged, but he did not indicate whether this species injured both kinds. On July 24, 1958, F. A. Estrada R., Jefe del Departamento de Entomología, Ministerio de Agricultura y Ganadería, Managua, Nicaragua, wrote me of damage to fruit in the vicinity of Madera and Calera, Managua, Nicaragua. Moths from there were sent to me for identification (lot No. 58 14029). Except for two specimens of a nonpiercing species, all were *pyrgo*.

Gonodonta nutrix (Cramer)⁶

(Pls. 2, G; 6, A; 7, I)

Phal.[aena] Noct.[ua] nutrix Cramer, 1780, De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America (Papillons Exotiques, des Trois Parties du Monde, l'Asie, l'Afrique et l'Amérique), v. 4, pp. 46, 251 [index, 1782], pl. 312, fig. B. — Stoll, 1791, Aanhangsel van het Werk, de Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America, door den Heere Pieter Cramer, pp. 92, 383 [index, error for 183], pl. 18, fig. 8 [larva, published 1790].

Noctua nutrix (Cramer). — Olivier, 1811, in Encyclopédie Méthodique, Zoologie, Histoire Naturelle Insectes, v. 8, p. 296.

Gonodonta nutrix (Cramer). — Hübner, 1823, Verzeichniss Bekannter Schmettlinge [sic], p. 263. — Guénéée, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 370. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 949. — Herrich-Schäffer, 1868, Corresp.-Blatt Zool.-Min. Ver. Regensburg (Naturw. Ver. Regens-

⁵ See footnote 3, p. 6.

⁶ In the Catalogue of the Books, Manuscripts, Maps and Drawings in the British Museum (Natural History), 1903, volume 1, page 398, there is a statement that the pages of volume 4 beyond page 32 of Cramer's De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America should be credited to Caspar Stoll. Except for the signed footnotes and the 29-page Proeve, which were written by Stoll, I consider Cramer to be the author of the entire volume. In the bibliographic citations in the supplementary work, Aanhangsel van het Werk, de Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America, Stoll credits the species described in volume 4 to Cramer.

burg) 22: 185. — Möschler, 1878, Stettin. Ent. Ztg. 39: 433; 1880, Zool.-Bot. Gesell. Wien, Verhandl. 30: 393. — Gundlach, 1881, Contribución á la Entomología Cubana, Lepidopteros, v. 1, p. 335. — Druce, 1887, in Godman and Salvin, Biología Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 254. — Möschler, 1890, Senckenb. Naturf. Gesell. Abhandl. 16: 182. — Dyar, 1903, U. S. Natl. Mus. Bul. 52, p. 198. — Barnes and McDunnough, 1917, Check List of the Lepidoptera of Boreal America, p. 87. — Grossbeck, 1917, Amer. Mus. Nat. Hist. Bul. 37: 64. — McDunnough, 1938, South. Calif. Acad. Sci. Mem., v. 1, p. 124. — Bruner, Scaramuzza, and Otero, 1945, Cuba Estac. Expt. Agron. Bol. 63, pp. 13, 14, 50. — Crumb, 1956, U. S. Dept. Agr. Tech. Bul. 1135, p. 321. — King and Thompson, 1958, Fla. Ent. 41: 61.

Phalaena acneptera Sepp, [1832-40 (?)],⁷ Surinaamsche Vlinders, v. 1, p. 105, pl. 49.

Gonodonta acneptera (Sepp). — Walker, 1858, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 15, p. 1790. — Möschler, 1878, Stettin. Ent. Ztg. 39: 433, [synonym of *nutrix* (Cramer)].

The broad white costal streak of the forewing sets this species apart from all the other species of the *chorinea* group. The ventral tuft of scales on the apex of the second segment of the labial palpus distinguishes this species from those of the *sicheas* group, except *pyrgo*. *G. nutrix* can be separated from *pyrgo* by the irregular basal part of the inner margin of the white costal streak; by the very large pale area of the hindwing, which is about twice as wide as the dark marginal band; by the fringe of the hindwing being interrupted with brown at the veins, especially M_2 , Cu_1 , and Cu_2 ; and by the male and female genitalia. This species is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row f) as "nutrix." Length of wing: Male, 17 to 20 mm.; female, 17 to 20 mm.

Types.—There are two males from the Stoll collection in the Rijksmuseum van Natuurlijke Historie in Leiden, Netherlands. Both are labeled "Raye, Surinam." One specimen bears a round white label; the other has a small rectangular and less neatly written label. I select the male with the round label as the lectotype of *nutrix*. The location of the type of *Phalaena acneptera* Sepp is unknown, and it is presumed to be lost.

Type localities.—The specimens on which the descriptions of *nutrix* and *acneptera* were based were all from Surinam.

Food plants.—*Annona glabra* (pond-apple, bagá), *squamosa* (sugar-apple, anón), *Brunfelsia undulata*, and *Lycopersicon esculentum* (tomato, tomate).

Distribution.—Fifty-two specimens have been examined. They are from the following localities: MÉXICO. *San Luis Potosí*: Near Valles. SALVADOR. San Salvador. PANAMÁ. *Canal Zone*: Barro Colorado Island. BOLIVIA. *Gutiérrez*: Province del Sara. PARAGUAY. San Bernardino; Sapucay. BRASIL. *Santa Catarina*: Jaraguá. Amazonas: Ponte Nova, Rio Xinga. FRENCH GUIANA. Saint-Jean; Saint-Laurent. SURINAM. Moengo, Boven Cottica Rivier. VENEZUELA. *Aragua*: El Limón. SAINT LUCIA. "St. Lucia." JAMAICA. Rae Town; Baron Hill, Trelawny; "Jamaica." CUBA. *Habana*: Santiago de

⁷ See footnote 12, p. 45.

las Vegas. *Pinar del Río*: San Vicente de los Baños. *Oriente*: Cuabitas, Santiago de Cuba. "Torriente." "Cuba." FLORIDA. *Dade County*: Florida City; Homestead; Miami; Royal Palm Park. *Broward County*: Fort Lauderdale. *St. Lucie County*: Fort Pierce.

Method of determination.—A specimen was identified from the illustration in Cramer's work. The synonym *G. acmeptera* (Sepp) is also satisfactorily illustrated.

Remarks.—According to the literature and data on labels on specimens in the collection of the United States National Museum, *nutrix* pierces oranges and fruit of species of *Annona*. In 1941 *nutrix* was very abundant in localized areas of Matanzas, Cuba, and caused serious losses of oranges there. Since then it has been observed piercing oranges in México and in Florida. King and Thompson (1958, pp. 61-65) have reported on injuries caused by *nutrix* in Florida.

Gonodonta lincus (Cramer)

(Pls. 2, F; 6, H)

Phal.[aena] Bombyx lincus Cramer, 1775, De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America (Papillons Exotiques, des Trois Parties du Monde, l'Asie, l'Afrique et l'Amérique), v. 1, pp. 79, 153 [index, 1776], pl. 50, fig. H.

Bombyx lincus (Cramer). — Fabricius, 1781, Species Insectorum, v. 2, p. 192; 1787, Mantissa Insectorum, v. 2, p. 125. — Olivier, 1790, in Encyclopédie Méthodique, Zoologie, Histoire Naturelle Insectes, v. 5, p. 79.

Gonodonta lincus (Cramer). — Hübner, 1823, Verzeichniss Bekannter Schmettlinge [sic], p. 263. — Guénee, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 366. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 952. — Druce, 1887, in Godman and Salvin, Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 255.

Athysania lincus (Cramer). — Kaye and Lamont, 1927, Trinidad and Tobago Dept. Agr. Mem. 3, p. 46.

Gonodonta superba Möschler, 1880, Zool.-Bot. Gesell. Wien, Verhandl. 30: 393, pl. 9, fig. 48. [New synonymy.]

This beautiful species may be separated from all the other species of the *chorinea* group, except *sitia*, *uxoria*, and *fernandezi*, by the combination of the darkly colored head and the presence of a pale area on the hindwing. *G. lincus* may be separated from the three species mentioned by the pale inner margin of the ventral surface of the hindwing, a continuation of the pale coloration of the median area, not fuscous as in the other species, and by the distinctive pattern of the dorsal surface of the forewing, dark basad of a black oblique postmedial line, except for two white spots that represent the reniform and some irregular white marks near the costa that represent the antemedial band. This species is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row g) as "lincus." Length of forewing: Male, 18 to 20 mm.; female, 18 to 20 mm.

Types.—The type of *lincus* is in the Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands. Since Möschler's types are

supposed to be in the Zoologisches Museum, Berlin, Germany, the type of *superba* may be in that collection.

Type localities.—The type of *lincus* is from Surinam. The specimens on which the description of *superba* was based were from Paramaribo, Surinam.

Food plant.—Unknown.

Distribution.—Twenty specimens have been examined. They are from the following localities: MÉXICO. *Veracruz*: Presidio. COSTA RICA. *Cartago*: Sitio [Sitio de Avance (?)]. COLOMBIA. *Cundinamarca*: Pueblo Guasca, Bogotá. PERÚ. *Loreto*: Iquitos. BOLIVIA. *Cochabamba*: Cochabamba. BRASIL. *Santa Catarina*: Hansa Humbolt; Jaraguá. *Espirito Santo*: "Espirito Santo." BRITISH GUIANA. *Essequibo*: Omai. "Brit. Guiana." VENEZUELA. *Aragua*: Route Maracay-Choroní. *Distrito Federal*: Caracas. *Bolivar*: Route El Dorado-Santa Elena, Km. 107.

Method of determination.—A specimen was identified by means of the illustration accompanying the original description. The identity of *superba* as a synonym of *lincus* is based on the illustration published with Möschler's description.

Gonodonta uxoria (Cramer)

(Pls. 2, E; 6, O)

Phal.[aena] Noct.[ua] uxoria Cramer, 1780, De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America (Papillons Exotiques, des Trois Parties du Monde, l'Asie, l'Afrique et l'Amérique), v. 3, pp. 150, 176 [index], pl. 276, fig. A.

Gonodonta uxoria (Cramer). — Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuélites II), p. 368. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 953. — Herrich-Schäffer, 1868, Correspondenzblatt Zool.-Min. Ver. Regensburg (Naturw. Ver. Regensburg) 22: 185. — Möschler, 1880, Zool.-Bot. Gesell. Wien, Verhandl. 30: 393. — Gundlach, 1881, Contribución a la Entomología Cubana, Lepidopteros, v. 1, p. 333. — Stahl, 1883, Fauna de Puerto Rico, Catálogo del Gabinete Zoológico, p. 194. — Wolcott, 1924, Porto Rico Dept. Agr. Jour. 7: 176. — Schaus, 1940, Scientific Survey of Porto Rico and the Virgin Islands, v. 12, pt. 2, p. 258. — Wolcott, (1948) 1951, Puerto Rico Univ. Jour. Agr. 32: 617.

Athysania uxoria (Cramer). — Kay and Lamont, 1927, Trinidad and Tobago Dept. Agr. Mem. 3, p. 46.

Gonodonta marmorata Schaus, 1906, U. S. Natl. Mus. Proc. 30: 111; 1940, Scientific Survey of Porto Rico and the Virgin Islands, v. 12, pt. 2, p. 258. — Bruner, Scaramuzza, and Otero, 1945, Cuba Estac. Expt. Agron. Bol. 63, pp. 131, 140, 145. — Wolcott, (1948) 1951, Puerto Rico Univ. Jour. Agr. 32: 617. [New synonymy.]

Gonodonta soror (Cramer) auct. nec Cramer. — Wolcott, 1924, Porto Rico Dept. Agr. Jour. 7: 176. — Schaus, 1940, Scientific Survey of Porto Rico and the Virgin Islands, v. 12, pt. 2, p. 258. — Wolcott, (1948) 1951, Puerto Rico Univ. Jour. Agr. 32: 617. [See comments under *soror*, p. 50.]

This species agrees with *sitia*, *lincus*, and *fernandezi* in having the head darkly colored and a pale area present on the hindwing. *G. uxoria* differs from *sitia* by the presence of well-marked transverse lines in the anterior part of the forewing and the fuscous

area between the inner margin of the hindwing and the inner edge of the pale area being not wider than the pale area. Characters for the separation of *uxoria* and *lincus* are given under the latter species (p. 25). The closely related *fernandezii* may be separated from *uxoria* by characters of maculation of the subterminal part of the forewing and by the extent of the fuscous scaling along the costal margin of the lower surface of the hindwing. In *uxoria* a dark fuscous and lilacine spot is present on the subterminal part of vein M_2 , and the adterminal line is dark in the cells on either side of vein Cu_1 . In *fernandezii* the coloration around the subterminal part of M_2 is lighter than that of the adjacent areas of the wing, and there are very distinct black parts of the adterminal line on veins M_3 and Cu_1 . In *fernandezii* there is a short dash of dark scaling on the lower surface of the hindwing from the base of the wing between Sc and the costal margin. This dark scaling is not present in *uxoria*. *G. uxoria* is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row h) as "marmorata." Length of the forewing: Male, 14 to 19 mm.; female, 16 to 20 mm.

Types.—The type of *uxoria* is not in the collection of the Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands, with other Cramer types and is presumed to be lost. The type of *marmorata* is in the United States National Museum.

Type localities.—The type of *uxoria* was from Surinam and that of *marmorata* from Coatepec, México.

Food plants.—*Pothomorphe peltata* (caisimón), *Piper* sp. (platanillo de Cuba), and *Persea americana* (American avocado, aguacate).

Distribution.—Forty-nine specimens have been examined. They are from the following localities: MÉXICO. Veracruz: Coatepec; Jalapa; Orizaba; Presidio; Motzorongo. GUATEMALA. Izabal: Cayuga. Baja Verapaz: Chejel. COSTA RICA. Cartago: Juan Viñas. PANAMÁ. Canal Zone: Barro Colorado Island. PERÚ. "Peru." ARGENTINA. Tucumán: Tucumán. BRITISH GUIANA. Essequibo: Rockstone. VENEZUELA. Carabobo: Las Quiguas, San Esteban Valley; Valle del Río Borburata. Aragua: Rancho Grande. Distrito Federal: La Florida, Caracas. Bolívar: Route El Dorado-Santa Elena, Km. 107. PUERTO RICO. Lares; "P. R." REPÚBLICA DOMINICANA. San Lorenzo; Sánchez. JAMAICA. Bath, St. Thomas; Greenhills, Hardwar Gap; "Jamaica." CUBA. Habana: Santiago de las Vegas. Matanzas: Matanzas. "Cuba."

Method of determination.—*G. uxoria* was recognized from the illustration accompanying the original description. The illustration is very poor, and Schaus refused to accept it as being of the same species as his *marmorata*, although he did state that it might be the same. I believe they are the same and have placed *G. marmorata* Schaus as a synonym of *G. uxoria* (Cramer).

Remarks.—Bruner, Scaramuzza, and Otero (1945, p. 145) reported that adults of *uxoria* fed on different kinds of fruit in the laboratory.

Gonodonta fernandezi, new species

(Pls. 5, E; 6, P)

Vestiture of head, palpi, and thorax mostly dark gray or fuscous; ventral and inner surfaces of palpi pale brown; small white spot on head immediately caudad of base of antenna; front of head, patagia, tegulae, and thorax with some pale-tipped scales. Outer margin of forewing weakly angled at M_3 ; tooth at tornus and scale tooth of inner margin small; fringe serrate, darker at veins; anterior part of forewing fuscous, except transverse bands and apex; posterior part of forewing suffused with metallic gray scales; reniform vague, except white toward inner margin of wing; antemedial band conspicuous, lighter than remainder of wing near costa, bent basad in area of fold; postmedial band rather vague, especially distally, mostly of dark elements, except for pale-blue patch at costa; subterminal line serrate, black, but with apices of serrations pink; adterminal line black, strongly serrate in anterior part of wing, straight and heavily marked on M_3 and Cu_1 . Hindwings fuscous, except for narrow, orange, pale area extending from costa to distal fourth. Forewing below mostly fuscous, fringe and area along inner margin pale straw yellow. Lower surface of hindwing similar to upper surface, except for spur of fuscous into pale area at base of wing. Length of forewing: Male, 17 mm.; female, 18 to 19 mm.

Male and female genitalia similar to those of other species of *chorinea* group.

Type.—Holotype, female, Rockstone, Essequibo, British Guiana, type No. 63456; one male paratype, Valle del Río Borburata, Carabobo, Venezuela, July 6, 1956, R. Lichy; in the United States National Museum. Two female paratypes, Valle del Río Borburata, Carabobo, Venezuela, July 7, 1956, R. Lichy; one female paratype, same place and collector, February 14, 1942; one female paratype, same place and collector, March 5, 1957; in the private collection of Mr. Lichy, Caracas, Venezuela.

Food plant.—Unknown.

Distribution.—As given for the type series.

Remarks.—*G. fernandezi* is similar to *uxoria*, but it is easily separated from that species by the following characters: Adterminal line of forewing straight and heavily marked on veins M_3 and Cu_1 , forewing lacking fuscous patch between adterminal and subterminal lines on vein M_2 , and spur of fuscous scaling extending from base of wing into pale area of lower surface of hindwing.

Gonodonta chorinea (Cramer)

(Pls. 4, H; 6, I)

Phal.[aena] Noct.[ua] chorinea Cramer,* 1780, De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America

* The spelling of the specific name is that found in the Dutch text and in the index. In the French text the specific name is given as "*chorinea*."

- (Papillons Exotiques, des Trois Parties du Monde, l'Asie, l'Afrique et l'Amérique), v. 4, pp. 42, 248 [index, 1782], pl. 310, fig. F.
- Athysania chorinea* (Cramer). — Hübner, 1823, Verzeichniss Bekannter Schmettlinge [sic], p. 263. — Kay and Lamont, 1927, Trinidad and Tobago Dept. Agr. Mem. 3, p. 46.
- Gonodonta chorinea* Hübner.* — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 951.
- Phal.[aena] Noct.[ua] choninea* Cramer, 1780, De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America (Papillons Exotiques, des Trois Parties du Monde, l'Asie, l'Afrique et l'Amérique), v. 4, p. 42, pl. 310, fig. F [misspelling].
- Gonodonta choninea* (Cramer). — Guénee, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuéliés II), p. 366. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 951. — Druce, 1887, in Godman and Salvin, Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 255.

This species has the head dark, concolorous with the thorax. The hindwing lacks a pale area, although some females show some orange scaling on veins M_2 and Cu_1 immediately distad of the cell. In the color of the head and hindwing, *chorinea* agrees only with *aequalis* and *fulvidens*. The bright orange-colored tornus, which is lighter than the rest of the forewing, separates *chorinea* from *aequalis*. The well-defined antemedial line and the suffusion of opalescent scaling in the median area of the forewing of *chorinea* distinguish it from *fulvidens*. The illustrations in Seitz ([1919-46], pl. 90 [1940-46], row g) of "*chorinea* ♀" and "*chorinea* ♂" are not of this species but are of *immacula*. In each illustration the head is white, the tornus dark, and the median area of the forewing is not suffused with opalescent scaling. Length of forewing: Male, 16 to 20 mm.; female, 15 to 21 mm.

Type.—The type is apparently lost, at least it is not in the Rijksmuseum van Natuurlijke Historie in Leiden, Netherlands, with other Cramer types.

Type locality.—Surinam.

Food plant.—*Piper* sp. Adults reared from larvae collected on *Piper* in British Guiana are in the collection of the United States National Museum.

Distribution.—Only 10 specimens have been available for study. They are from the following localities: BOLIVIA. *Santa Cruz*: Buena Vista. BRASIL. *Santa Catarina*: Jaraguá; Neu Bremen. *Distrito Federal*: Rio de Janeiro. *Espirito Santo*: "Espirito Santo." FRENCH GUIANA. Sixty miles up Maroni River. BRITISH GUIANA. *Demerara*: Georgetown.

Method of determination.—A specimen was identified from the original description and illustration.

Gonodonta fulvidens Felder and Rogenhofer

(Pls. 4, C; 6, L; 11, B)

Gonodonta fulvidens Felder and Rogenhofer, 1872, Reise der Österreichischer Fregatte Novara um die Erde, Zoologischer Theil, v. 2, Abt. 2, Atlas,

* Walker erroneously credited the specific name to Hübner and listed it as a synonym of *Gonodonta choninea* (Cramer).

Inhalts-Verzeichniss Heterocera, p. 10, pl. 111, fig. 14.
Athysania flavidens Hampson, 1926, New Genera and Species of Noctuidae
 in the British Museum, p. 372. [New synonymy.]

The dark head and dark hindwings separate *fulvidens* from most of the species of the *chorinea* group. The only other species with this combination are *chorinea* and *aequalis*. Characters for the separation of *fulvidens* from *chorinea* may be found in the diagnosis of the latter (p. 28). The tornus of *fulvidens* is yellowish orange and distinctly lighter in color than the rest of the forewing, whereas the tornus of *aequalis* is dull yellowish brown. *G. fulvidens* is closely related to *incurva* and *nitidimacula*, but these species have white heads and usually some orange on the hindwing. Length of forewing: Male, 15 to 19 mm.; female, 17 to 19 mm.

The female genitalia of *fulvidens* are specifically distinct from those of the other species of the *chorinea* group. The ductus bursae is nearly three times as long as wide (see pl. 11, B), whereas in the other species it is less than twice as long as wide (see pl. 12, B).

Types.—As a type was not indicated in the original description and as the authors had more than one specimen (two localities are given), it is necessary to select a lectotype for this species. There is a female specimen from the Felder collection in the British Museum (Natural History) labeled as follows: "Bogota 676" "Novara" "imacula Guen. noch mehr aequalis Walk. affinis" "cxi 14 *Gonodonta fulvidens* Bogota" and "?? v *Chorinea* Cram. 310 f." It is designated as the lectotype and has been so labeled by D. S. Fletcher. The type of *G. flavidens* (Hampson) is also in the British Museum.

Type localities.—The lectotype of *fulvidens* is from Bogotá, Colombia. The type of *flavidens* is from Ega, Amazonas, Brasil.

Food plant.—Unknown.

Distribution.—Seven specimens have been examined. They are from the following localities: BRASIL. "Brazil." FRENCH GUIANA. Cayenne. BRITISH GUIANA. *Essequibo*: Kartabo; Tumatumari. Potaro River. VENEZUELA. *Territorio Federal Amazonas*: Samariapo.

Method of determination.—The species was identified from the excellent illustration in the Atlas of the Reise der Österreichischen Fregatte Novara um die Erde, Zoologischer Theil (v. 2, Abt. 2, pl. 111, fig. 14).

Gonodonta aequalis Walker

(Pls. 4, G; 7, B)

Gonodonta aequalis Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 956.

The dull yellowish-brown tornus separates *aequalis* from *chorinea* and *fulvidens*, the only other species of the *chorinea* group that lack a pale area on the hindwing and have the head concolorous with the thorax. In the last two species the tornus is orange (*chorinea*) or yellowish orange (*fulvidens*) and distinctly lighter in color than the rest of the forewing. *G. aequalis* super-

ficially resembles *immacula*, but the dark head and the dark-brown lines of the antemedial band between the fold and the inner margin of the forewing of *aequalis* separate it from *immacula*. The maculation of the forewing is nearly identical to that of the following species, *paraequalis*, but the head of the latter is white. Length of forewing: Male, 14 to 16 mm.; female, 16 to 18 mm.

Type.—In the British Museum (Natural History).

Type locality.—"Santarem."

Food plant.—Unknown.

Distribution.—Fifteen specimens from the following localities have been examined: COLOMBIA. *Magdalena*: Río Frio. VENEZUELA. *Yaracuy*: Aroa. *Aragua*: Rancho Grande; El Castano "cr." Maracay. *Carabobo*: Valle del Río Borburata. *Trujillo*: Carvajal. TRINIDAD. "Trinidad."

Method of determination.—A specimen agreeing with the original description was sent to D. S. Fletcher, who compared it with the type.

Remarks.—Schaus (1940, p. 259) has followed Möscher in applying the name *G. aequalis* Walker to a species of *Calpe* Ochs. Walker's species is a *Gonodonta*, but it does bear some superficial resemblance to some of the species of *Calpe*.

Gonodonta paraequalis, new species

(Pls. 4, F; 7, F)

Vestiture of head white, except lateral surface of second segment of palpus and narrow occipital fringe, which are brown; vestiture of thorax mostly of brown hairlike scales, but with some wider pale-tipped scales. Termen of forewing weakly convex from apex to M_3 , straight from M_3 to tornus; fringe uniform, concolorous with contiguous area of wing; tooth at tornus and scale tooth of inner margin moderately large, dull orange, except apex of tooth at tornus, which is gray; basal and medial areas of wing yellowish brown, area distad of postmedial band paler; reniform vague, but discernible, with usual small black point at middle of basal margin; fold of forewing conspicuously marked by pale-brown opalescent-tipped scales; black terminal point and black postmedial crescent in fold; antemedial band well marked only between fold and inner margin, elements dark brown, distinctly contrasting with ground color of wing; postmedial band rather vague, distal elements straight, slightly darker than ground color; adterminal line serrate, serrations acute toward base, rounded toward termen. Hindwings entirely fuscous. Lower surface of both wings grayish brown, dark-brown spot at base of tornus of forewing being only conspicuous maculation.

Male and female genitalia similar to those of other species of *chorinea* group. Length of forewing: Male, 17 mm.; female, 18 mm.

Type.—Holotype, male, Orizaba, México, August 1909, R. Muller, type No. 63457; one female paratype, Quirigua [Quirigua Viejo (?)], Guatemala, February, Wm. Schaus; in the United States National Museum.

Food plant.—Unknown.

Distribution.—As given above.

Remarks.—Except for the coloration of the head, the maculation of this species is almost identical to that of *aequalis*, and *paraequalis* may be only a subspecies of that species. However, in the absence of evidence to the contrary, the differences of head coloration and geographic distribution are considered to be of specific magnitude.

Gonodonta pulverea Schaus

(Pls. 4, I; 6, R)

Gonodonta pulverea Schaus, 1911, Ann. and Mag. Nat. Hist., Ser. 8, 7: 83.

This species can be separated from all the other species of the genus by the very characteristic maculation of the forewing, the posterior area from just before the fold to the inner margin suffused with gray, lighter in color than the anterior part of the wing, and a transverse series of small whitish points immediately distad of the postmedial band. *G. pulverea* is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row g) as "pulverea." Length of forewing: Male, 15 to 18 mm.; female, 16 to 18 mm.

Type.—In the collection of the United States National Museum.

Type locality.—Tuis, Costa Rica.

Food plant.—Unknown.

Distribution.—Only 11 specimens have been examined. They are from the following localities: GUATEMALA. *Izabal*: Cayuga. COSTA RICA. *Cartago*: Tuis. PERÚ. *San Martín*: Jepelacio. VENEZUELA. *Yaracuy*: Aroa. *Carabobo*: Las Quiguas, San Esteban Valley.

Method of determination.—Examination of the type.

Gonodonta parens Guénéé

(Pls. 4, B; 7, A)

Gonodonta parens Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 366. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 952.

Gonodonta plumbicineta Dyar, 1912, U. S. Natl. Mus. Proc. 42: 79. [New synonymy.]

G. parens is obviously closely related to *nitidimacula*, but the complete or nearly complete suffusion of the pale area of the hindwing, the straight, slightly convex adterminal line of the forewing, and the absence of a contrasting fold in *parens* separate it from *nitidimacula*. The other species of the *chorinea* group that have the head lighter in color than the thorax and lack a distinct pale area on the hindwing and a contrasting fold in the forewing either have reddish-brown striae between the veins or have the elements of the antemedial band between the fold and inner margin directly transverse or slightly oblique to the costa of the forewing. The specimen illustrated in Seitz ([1919-46], pl. 90 [1940-46], row g) as "plumbicineta" is not this species, as there is a distinct

pale area on the hindwing and the elements of the antemedial band of the forewing are oblique to the costa of the wing. Length of forewing: Male, 17 to 19 mm.; female, 18 to 20 mm.

Types.—The type of *parens* is in the British Museum (Natural History) and that of *plumbicincta* is in the United States National Museum.

Type localities.—The type of *parens* is from Guadeloupe and that of *plumbicincta* from Orizaba, México.

Food plant.—Unknown.

Distribution.—Twenty-six specimens from the following localities were available for this study: MÉXICO. *Veracruz*: Orizaba. PANAMÁ. *Canal Zone*: Barro Colorado Island. VENEZUELA. *Aragua*: Rancho Grande; Route Maracay-Choroní, Km. 25. *Miranda*: San Antonio, near Los Teques. *Distrito Federal*: Massif du Naiguatá. *Carabobo*: Valle del Río Borburata, vicinity of Puerto Cabello.

Method of determination.—A specimen agreeing with the type of *plumbicincta* was sent to D. S. Fletcher, and he compared it with the type of *parens*.

Gonodonta immacula Guénéé

(Pls. 4, E; 7, K)

Gonodonta immacula Guénéé, 1852, *Histoire Naturelle des Insectes, Species Général des Lépidoptères*, v. 6 (Noctuérites II), p. 365. — Walker, 1857, *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum*, pt. 12, p. 951. — Druce, 1887, in Godman and Salvin, *Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera*, v. 1, pt. 60, p. 255. — Dyar, 1914, *U. S. Natl. Mus. Proc.* 47: 203.

Athysania panoana Schaus, 1933, *Ann. and Mag. Nat. Hist.*, Ser. 10, 12: 374. [New synonymy.]

Because of variation in the coloration of the fold of the forewing, this species will be found to run to two different points in the key to the species of the genus. Specimens in which the fold is distinctly lighter in color than the contiguous areas of the wing may be separated from other similarly marked species of the *chorinea* group that have a white head and lack a pale area on the hindwing by the following characters: Vein Cu₂ of forewing concolorous with contiguous areas and line of antemedial band between fold and inner margin not distinctly darker than between fold and costa. Those specimens of *immacula* in which the fold is concolorous with the contiguous areas of the wing may be separated from the other species of the *chorinea* group as follows: Head white, hindwings lacking pale area, lines of antemedial band between fold and inner margin not parallel to costa, and distal line of postmedial band followed by a series of small brassy-colored crescents or angular points. *G. immacula* is generally characterized by its dull-brown coloration and its lack of contrasting marking, except for the brassy crescents distad of the postmedial band. The ground color varies from dark brown to yellowish brown. The type of *G. panoana* (Schaus) is in my opinion a large specimen of this species, in which the ground color is yellowish brown. The variation in color does not appear to be of a geo-

graphic nature, and I therefore place the Schaus name in the synonymy of *immacula*. This species is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row g) as "chorinea ♀" and "chorinea ♂." Length of forewing: Male, 14 to 19 mm.; female, 15 to 18 mm.

Types.—Guénéé described the species from two specimens, one from "Cayenne" and the other from "Bresil," both from "Coll. Feisth." It is presumed that the specimens were from the collection of M. le général Baron Joaq. Frc. Philib. de Feisthamel. I have been unable to find any information relative to the fate of his collection and accordingly of the syntypes of this species. There is a specimen determined as *immacula* by Guénéé in the British Museum (Natural History). It cannot be one of the syntypes, as it is known to have been determined after the publication of the description. In the absence of type material, it is considered to be representative of the species. The type of *G. panoana* (Schaus) is in the United States National Museum.

Type localities.—The specimens before Guénéé at the time of the original description were from "Cayenne" and "Bresil." The type of *panoana* is from Alto da Serro, São Paulo, Brasil.

Food plant.—Unknown.

Distribution.—One hundred and eight specimens have been studied. They are from the following localities: MÉXICO. *Veracruz*: Córdoba; Jalapa; Presidio; Misantla. GUATEMALA. *Izabal*: Cayuga; Quirigua [Quiriquá Viejo (?)]. *Baja Verapaz*: Chejel. *Retalhuleu*: San Sebastian. HONDURAS. *Atlántida*: Lancetilla, Tela. COSTA RICA. *Limón*: Río Banana [Banano (?)]. "Avangarez." PANAMÁ. *Canal Zone*: Barro Colorado Island. *Chiriquí*: "Chiriquí." PERÚ. *San Martín*: Tarapoto. BOLIVIA. *Cochabamba*: Cochabamba; Yungas del Espíritu Santo. PARAGUAY. Sapucay; "Paraguay." BRASIL. *Rio Grande do Sul*: Pelotas. *São Paulo*: Alto da Serro. *Amazonas*: Monte Christo, Río Tapajós. FRENCH GUIANA. Saint-Jean; Saint-Laurent; Cayenne. SURINAM. Saramacca Punt [Sint Barbara Pin]; Suriname Rivier. VENEZUELA. *Yaracuy*: Aroa. *Aragua*: Rancho Grande; Guiripa-San Casimiro. *Carabobo*: Las Quiguas, San Esteban Valley; Valle del Río Borburata. TRINIDAD. Arepo Savanna, Cumuto River; "Trinidad."

Method of determination.—A specimen agreeing with the original description was sent to D. S. Fletcher, and he compared it with the specimen that was determined as *immacula* by Guénéé.

Gonodonta correcta Walker

(Pls. 2, H; 7, H)

Gonodonta correcta Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 947. — Druce, 1887, in Godman and Salvin, *Biología Centrali-Americana*, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 254.

G. correcta differs from the other species of the *chorinea* group that also have the head lighter than the thorax, a pale area present on the hindwing, and the inner margin with some fuscous coloration.

tion, except *nutrix* and an occasional specimen of *latimacula*, in that the pale area of the hindwing is large, at least twice as wide as the fuscous coloration along the inner margin. The white costal streak of the forewing of *nutrix* and the straw-yellow coloration of the anterior part of the median area of the forewing of *latimacula* readily separate them from *correcta*. Length of forewing: Male, 21 to 23 mm.; female, 21 to 23 mm.

Type.—In the British Museum (Natural History).

Type locality.—"Mexico."

Food plant.—Unknown.

Distribution.—Twenty-eight specimens have been examined. They are from the following localities: MÉXICO. Veracruz: Jalapa; Coatepec. GUATEMALA. *Baja Verapaz*: Chejel. COSTA RICA. Cartago: Sitio de Avance. Limón: Guápiles. COLOMBIA. Vaupés: Upper Río Negro. BOLIVIA. Cochabamba: Cochabamba. VENEZUELA. Aragua: Route Maracay-Ocumare de las Costa; Rancho Grande. Carabobo: Valle del Río Borburata.

Method of determination.—A specimen agreeing with the original description was sent to D. S. Fletcher, who verified the determination by comparing the specimen with the type in the British Museum.

Gonodonta maria Guénéé

(Pls. 3, G; 6, Q)

Gonodonta maria Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuélites II), p. 369. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 953.

Gonodonta avangareza Schaus, 1911, Ann. and Mag. Nat. Hist., Ser. 8, 7: 83. [New synonymy.]

G. maria differs from all the other species of the *chorinea* group that have a white head and a pale area on the hindwing, because the postmedial band of the forewing is composed of a fine, straight, blue line bordered on either side by broader lines of fuscous coloration and it reaches the costa at about one-third the length of the wing from the apex. In the other closely related species the lines of the postmedial band are not as described above, and the band reaches the costa at about one-fourth or less the length of the wing from the apex. Length of forewing: Male, 17 to 19 mm.; female, 19 to 20 mm.

Types.—D. S. Fletcher has selected and labeled one of the syntypes, a female, as the lectotype. The specimen selected is labeled "Gonod. Maria Gn. Spec. 1218, No. 1 Rio-janeiro M. Palmer." The lectotype is in the British Museum (Natural History). The type of *avangareza* is in the United States National Museum.

Type localities.—The lectotype of *maria* is from Rio de Janeiro, Brasil. The locality given for all specimens in the original description is "Bresil." The type of *avangareza* is from "Avangarez," Costa Rica.

Food plant.—Unknown.

Distribution.—Sixteen specimens from the following localities have been examined: MÉXICO. Veracruz: Jalapa. COSTA RICA.

"Avangarez." PERÚ. Loreto: Iquitos. BRASIL. Distrito Federal: Rio de Janeiro. "Brazil." BRITISH GUIANA. Essequibo: Tumatumari, Potaro River. VENEZUELA. Aragua: Rancho Grande. Bolívar: Route El Dorado-Santa Elena, Km. 107.

Method of determination.—A specimen agreeing with the type of *avangareza* and with the original description of *maria* was sent to D. S. Fletcher, who compared it with the specimen selected as the lectotype.

Gonodonta sitia Schaus

(Pls. 3, D; 6, K)

Gonodonta sitia Schaus, 1911, Ann. and Mag. Nat. Hist., Ser. 8, 7: 83.

G. sitia differs from *limous*, *uxoria*, and *fernandezi* of the *chorinea* group that have a dark head and a pale area on the hindwing, in that the ordinary lines of the forewing are indistinct between the fold and costa and the pale area of the hindwing is only about one-half as wide as the dark inner margin of the wing. The maculation of the forewing, except that it is darker, is very similar to that of *clotilda*, and it may be but a dark form of that species, but the necessary proof is lacking, so *sitia* is retained as a valid species.

Type.—In the United States National Museum.

Type locality.—The type is labeled "El Sitio, Costa Rica." The only locality of a similar spelling that I can find is Sitio de Avance, which is in the Province of Cartago.

Food plant.—Unknown.

Distribution.—It would appear, judging from the localities of the 12 specimens available for study, that this species is rather restricted in distribution. The known localities are as follows: COSTA RICA. "El Sitio" [Cartago: Sitio de Avance (?)]. PANAMÁ. Canal Zone: Barro Colorado Island. COLOMBIA. Santander: Landaruri.

Method of determination.—By examination of the type.

Gonodonta clotilda (Stoll)

(Pls. 3, C; 7, L)

Phal.[aena] *Noctua clotilda* Stoll, 1791, Aanhangel van het Werk, de Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America, door den Heere Pieter Cramer, pp. 153-155, 383 [index, error for 183], pl. 34, fig. 4.

Gonodonta clotilda (Stoll). — Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 369. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 949. — Druce, 1887, in Godman and Salvin, Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 254. — Schaus, 1940, Scientific Survey of Porto Rico and the Virgin Islands, v. 12, pt. 2, p. 258. — Bruner, Scaramuzza, and Otero, 1945, Cuba Estac. Expt. Agron. Bol. 63, pp. 13, 14, 50, 120, 124. — Wolcott, (1948) 1951, Puerto Rico Univ. Jour. Agr. 32: 616.

Gonodonta maria Guénéé auct. nec Guénéé. — Gundlach, 1831, Contribución á la Entomologia Cubana, Lepidopteros, v. 1, p. 335. — Stahl, 1883, Fauna de Puerto Rico, Catálogo del Gabinete Zoológico, p. 194. — Möschler, 1890, Senckenb. Naturf. Gesell. Abhandl. 16: 183. — Gundlach, 1891, Soc.

Españ. de Hist. Nat. Ann. 20: 188-189. — Wolcott, 1924, Porto Rico Dept. Agr. Jour. 7: 176. — Martorell, (1945) 1948, Puerto Rico Univ. Jour. Agr. 29: 510.

This well-known, widespread species may be separated from the other species of the *chorinea* group that have a white head and a pale area in the hindwing by the following combination of characters: Pale area of hindwing small, usually only about one-half as wide as fuscous band of inner margin; ordinary lines of anterior part of forewing vague; basal area of forewing not noticeably lighter than median area; ground color of anterior part of forewing basad of postmedial band brown, lighter than area between fold and inner margin; and a linear series of brassy crescents or angular marks immediately distad of postmedial band. *G. clotilda* is illustrated in color in Seitz ([1919-46], pl. 90 [1940-46], row h) as "clotilda." Length of forewing: Male, 16 to 19 mm.; female, 16 to 21 mm.

Type.—In the Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.

Type locality.—"Surinam."

Food plants.—*Annona glabra* (pond-apple, bagä), *squamosa* (sugar-apple, anón), *muricata* (soursop, guanábana), *cherimola* (cherimoya), *Orandira lanceolata* (lancewood, yaya), *Ocotea exaltata* (boniato amarillo).

Distribution.—One hundred and twenty-four specimens have been examined. They are from the following localities: MÉXICO. Veracruz: Jalapa. Yucatán: "Yucatan." "Mexico." COSTA RICA. San José: San José. PANAMÁ. Canal Zone: Barro Colorado Island. BOLIVIA. Cochabamba: Cochabamba; Incachaca. Gutiérrez: "Prov. del Sara." ARGENTINA. Tucumán: Tucumán. La Rioja: La Rioja. PARAGUAY. "Paraguay." BRASIL. Santa Catarina: Jaraguá; Hansa Humbolt; "Santa Catharina." Distrito Federal: Rio de Janeiro. Rio de Janeiro: Itatiaia. Pará: Belém. São Paulo: São Paulo. "Brazil." BRITISH GUIANA. Essequibo: Omai. "Brit. Guiana." VENEZUELA. Yaracuy: Aroa. Aragua: Rancho Grande; Cumbre Choroni. Carabobo: Valle del Río Borburata. Mérida: Valle "La Mucuy," Sierra Nevada de Mérida. Bolívar: Route El Dorado-Santa Elena, Kms. 38 and 107. TRINIDAD. "Trinidad." PUERTO RICO. *Sorbus*: Penón Collao. JAMAICA. Rae Town [Renon Town (?)]; "Jamaica." CUBA. Oriente: Baracoa; Sierra Maestra; Cuabitas, Santiago de Cuba. Las Villas: Soledad; Central Soledad. Matanzas: Matanzas. Habana: Vicinity of Habana. "Cba," "Cuba," "Torriente," "Santiago Prov."

Method of determination.—Recognized from the original description and illustration.

Remarks.—This species has been reported in the literature as piercing citrus fruit in the adult stage. I have a specimen that was observed piercing fruit of *Citrus* in Cuba.

Gonodonta bidens bidens Geyer

(Pls. 3, A; 5, G--H)

Gonodonta bidens Geyer, 1832, in Hübner, *Zuträge zur Sammlung Exotischer Schmetterlinge*, Viertes Hundert, p. 24, figs. 695, 696 (1826). — Walker, 1857, *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum*, pt. 12, p. 949. — Druce, 1887, in Godman and Salvin, *Biologia Centrali-Americana*, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 254 [partim].

Gonodonta bidens Hübner.¹⁰ — Guénee, 1852, *Histoire Naturelle des Insectes, Species Général des Lépidoptères*, v. 6 (Noctuérites II), p. 369. — Lucas, 1857, in Guérin-Méneville, *Animaux Articulés* (v. 7 of *Histoire Physique, Politique et Naturelle de l'Île de Cuba* by Ramon de la Sagra), p. 728. — Möschler, 1890, *Senckenb. Naturf. Gesell. Abhandl.* 16: 182. — Schaus, 1940, *Scientific Survey of Porto Rico and the Virgin Islands*, v. 12, pt. 2, p. 259. — Wolcott, (1948) 1951, *Puerto Rico Univ. Jour. Agr.* 32: 617.

Gonodonta soror (Cramer) auct. nec Cramer. — Gundlach, 1881, *Contribución a la Entomología Cubana*, Lepidopteros, v. 1, p. 334. — Möschler, 1890, *Senckenb. Naturf. Gesell. Abhandl.* 16: 182. — Gundiach, 1891, *Soc. Españ. de Hist. Nat. Ann.* 20: 188.

G. bidens differs from most of the other species of the *chorinea* group, in that the forewing basad of the antemedial band is distinctly lighter in color than the median part of that wing. Occasionally specimens of a few other species may have the basal area of the forewing lighter than the median area, but usually only slightly so and, unlike *bidens*, with Cu_2 of the forewing brick red in color. Length of forewing: Male, 18 to 19 mm.; female, 19 to 20 mm.

Type.—Unknown. I have not been able to learn whether it is in the Naturhistorisches Museum, Vienna, Austria.

Type locality.—"Cuba."

Food plant.—Unknown.

Distribution.—Only eight specimens of the typical subspecies were available for study. They were from the following localities: CUBA. *Matanzas*: Matanzas; San Miguel de los Baños. *Pinar del Rio*: Sierra Rangel. HAÏTI. Port-au-Prince; Pétionville.

Method of determination.—Identified by the excellent illustrations with the original description.

Remarks.—The specimens of this species that I examined may be divided by means of the characters of the ventral surface of the hindwing into three geographic populations. These populations are treated as subspecies, although two of them partially overlap one another in Colombia and Venezuela. The nominate subspecies is found in the Greater Antilles. The other two subspecies, *bidens meridionalis* and *bidens tenebrosa*, are continental in distribution, although a single specimen of one has been collected on Saint Lucia in the Lesser Antilles.

Specimens of *bidens bidens* may be identified by distribution and by characters of the ventral surface of the hindwing, i. e., by the reduced dark marginal band, which does not extend into the area between Sc and the costa, and by the yellow fringe between M_2 and Cu_2 . There is considerable color variation in the nominate

¹⁰ Guénee, Lucas, Möschler, Schaus, and Wolcott erroneously credited the specific name to Hübner.

subspecies. The size of the dark marginal band of the ventral surface of the hindwing is extremely variable as is the color of the fringe of the dorsal surface of the hindwing. In the latter character, specimens from Cuba vary from a completely yellow to a completely fuscous fringe. *G. bidens* is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row g and h) as "plumbicincta" and as "bidens," but it is not possible to determine the subspecies, as only the upper surfaces are illustrated.

Gonodonta bidens meridionalis, new subspecies

(Pl. 5, I)

Gonodonta soror (Cramer) auct. nec Cramer. — Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 368 [partim]. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 948 [partim]. — Felder and Rogenhofer, 1872, Reise der Österreichischen Fregatte Novara um die Erde, Zoologischer Theil, v. 2, Abt. 2, Atlas, Inhalts-Verzeichniss Heterocera, p. 10, pl. 111, fig. 13.

This subspecies differs from the nominate subspecies, in that the dark marginal band of the ventral surface of the hindwing extends into the area between Sc and the costa and the fringe of the ventral surface of the hindwing is usually darkly colored between veins M_2 and Cu_2 . Length of forewing: Male, 17 to 20 mm.; female, 17 to 21 mm.

Type.—Holotype, male, type No. 63527, Hansa Humbolt, Santa Catarina, Brasil; 3 female paratypes, same place; 1 female paratype, Belém, Pará, Brasil, Moss; 4 male paratypes, Tucumán, Tucumán, Argentina, R. Schreiter; 1 female paratype, same place, collection of Dognin; 1 male paratype, same place, May 1905; E. Dinelli; 2 female paratypes, Castro, Paraná, Brasil; 2 female paratypes, Espírito Santo, Brasil; 1 female paratype, Nova Teutonia, Santa Catarina, Brasil, June 1938, Fritz Plauman; 1 male paratype, Brasil, June 9, 1929, Zikan; 1 female paratype, 17° 46'-55' S. - 63° 5'-34' W. [vicinity of Santa Cruz], Santa Cruz, Bolivia; 2 male paratypes, Incachaca, Cochabamba, Bolivia, J. Steinbach; 1 male paratype, Perú, collection of Wm. Schaus; 1 female paratype, Sapucay, Paraguay, W. T. Foster; in the United States National Museum. Two male and two female paratypes, Neu Bremen, Santa Catarina, Brasil, December 12, 13, and 19, 1933, Fritz Hoffmann; 1 male paratype, same place and collector, January 25, 1934; 2 male paratypes, same place and collector, January 14, 1934; 1 female paratype, same place and collector, November 3, 1933; 1 male paratype, same place and collector, December 19, 1935; 1 female paratype, Jaraguá, Santa Catarina, Brasil, August 24, 1935, Fritz Hoffmann; 1 female paratype, same place and collector, December 19, 1933; in the collection of John G. Franclemont, Cornell University, Ithaca, N. Y. Two male paratypes, São Paulo, São Paulo, Brasil; 2 female paratypes, Rio de Janeiro, Distrito Federal, Brasil, November; 4 male and 4 female paratypes, Cochabamba, Bolivia, J. Steinbach, accession No. 6873; in the Carnegie Museum, Pittsburgh, Pa. One male paratype, Guarani, Rio Grande do Sul, Brasil, December 18, 1932,

C. M. de Biezanko; 1 female paratype, Pelotas, Rio Grande do Sul, Brasil, October 1947, C. Biezanko; in the collection of the Department of Entomology, Cornell University, Ithaca, N. Y. One female paratype, Blumenau, Santa Catarina, Brasil; 1 female paratype, Pelotas, Rio Grande do Sul, January 18, 1956, C. M. de Biezanko; 1 male paratype, same place and collector, December 4, 1955; in the Museum of Comparative Zoology, Harvard College, Cambridge, Mass.

Food plant.—Unknown. [See Remarks.]

Distribution.—*G. b. meridionalis* occurs from northern Argentina and Uruguay north to Colombia. In Venezuela and Colombia its range overlaps that of *bidens tenebrosa*, and therefore the specimens from these two countries have been eliminated from the paratype series of both subspecies. The specimens of *meridionalis* from Venezuela and Colombia are from the following localities: VENEZUELA. *Bolívar*: Suapure; Route El Dorado-Santa Elena, Km. 107. *Aragua*: Rancho Grande. *Carabobo*: Las Quiguas, San Esteban Valley; Valle del Río Borburata. COLOMBIA. *Tolima*: Amero. Including the type, paratypes, and the specimens from Venezuela and Colombia, 79 specimens have been studied.

Remarks.—The specimen from Amero, Colombia, is labeled as being from "Coconut Palm." Considering the known food plants of other species, it seems unlikely that coconut palm is the food plant. Possibly the label indicates that the adults were taken resting on the plant. One specimen, a female, labeled "Paraguay, Pouillon" is of the phenotype of the Central American subspecies.

Gonodonta bidens tenebrosa, new subspecies

(Pls. 3, B; 5, J; 6, F and S; 8, E-F; 12, B)

Gonodonta bidens Geyer. — Druce, 1887, in Godman and Salvin, *Biologia Centrali-Americana*, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 254 [partim].

Gonodonta bidens Hübner.¹¹ — Riherd and Wene, 1955, *Kans. Ent. Soc. Jour.* 28: 103, 106.

This subspecies differs from typical *bidens*, in that the dark marginal band of the ventral surface of the hindwing extends into the area between Sc and the costa. *G. b. tenebrosa* may be separated from both typical *bidens* and *bidens meridionalis* by the entirely fuscous band of the inner margin of the ventral surface of the hindwing. Length of forewing: Male, 18 to 21 mm.; female, 17 to 22 mm.

Type.—Holotype, male, Juan Viñas, Costa Rica, January, type No. 63528, Schaus and Barnes; 1 male and 2 female paratypes, Jalapa, México, Wm. Schaus; 1 female paratype, Orizaba, México, July 1906, R. Muller; 1 female paratype, Río Sixaola, Costa Rica, March; 1 female paratype, Barro Colorado Island, Canal Zone, Panamá, July 1941, J. Zetek; 1 male paratype, General Terán, Nuevo León, México, October 20, 1953, W. E. Stone; 1 male paratype, near Valles, San Luis Potosí, November 15, 1954, H. D. Smith; in the collection of the United States National Museum.

¹¹ Hübner as author of *bidens* is erroneous. See footnote 10, p. 38.

One male paratype, Chejel, Guatemala, September, Schaus and Barnes; 1 female paratype, Costa Rica, Cooper; 1 male paratype, Juan Viñas, Costa Rica, January, Schaus; 1 male paratype, same place and collector, November; 1 female paratype, Sitio [Sitio de Avance (?)], Costa Rica, May, Schaus; 1 male paratype, Cachí, Costa Rica, October, Schaus; in the collection of the Carnegie Museum, Pittsburgh, Pa. One male paratype, Barro Colorado Island, Canal Zone, Panamá, November 26, 1934, M. Bates, in the Museum of Comparative Zoology, Harvard College, Cambridge, Mass. One male paratype, Jalapa, México; 1 female paratype, San Pedro de los Pinos, Federal District, México, August 12, 1913, C. C. Hoffmann; 1 female paratype, Barro Colorado Island, Canal Zone, Panamá, February 11, 1936, Gertsch, Lutz, and Wood; 1 female paratype, Orizaba, Veracruz, México, October 1911, C. C. Hoffmann; in the American Museum of Natural History, New York, N. Y.

Food plant.—Unknown.

Distribution.—*G. b. tenebrosa* is found from Texas (see Riherd and Wene, 1955, pp. 103, 106) to Colombia and Venezuela. In the southern part of its range this subspecies overlaps with the South American subspecies. The specimens of *bidens tenebrosa* from this overlap area are from the following localities: COLOMBIA. Tolima: Amero. VENEZUELA. Yaracuy: Aroa. Aragua: Rancho Grande; Route Maracay-Choroní, Km. 25. Trujillo: Carvajal. Lara: Tecepaima. Carabobo: Valle del Río Borburata.

Remarks.—The adults of *bidens tenebrosa* caused extensive losses to citrus growers in northern México during the fall of 1953 by piercing ripening fruit. One specimen that was taken during this outbreak at General Terán, Nuevo León, México, is of the South American phenotype. The occurrence of this specimen in México and of another of the Central American phenotype in Paraguay, with no evidence of intermediates in northern South America, suggests that the color of the inner marginal area of the ventral surface of the hindwing is determined by a single gene.

Gonodonta unica Neumoegen

(Pls. 2, B; 7, J)

Gonodonta unica Neumoegen, 1891, Canad. Ent. 23: 125. — Smith, 1893, U. S. Natl. Mus. Bul. 44, p. 259. — Dyar, 1900, U. S. Natl. Mus. Proc. 23: 272; 1901, Wash. Ent. Soc. Proc. 4: 455; 1903, U. S. Natl. Mus. Bul. 52, p. 198. — Forbes, 1906, Field Tables of Lepidoptera, p. 110. — Barnes and McDunnough, 1917, Check List of the Lepidoptera of Boreal America, p. 87. — Grossbeck, 1917, Amer. Mus. Nat. Hist. Bul. 37: 63. — Holland, 1937, The Moth Book, p. 236, pl. 28, fig. 10. — McDunnough, 1938, South. Calif. Acad. Sci. Mem., v. 1, p. 124. — Crumb, 1956, U. S. Dept. Agr. Tech. Bul. 1135, p. 321.

G. unica differs from all the known species of the *chorinea* group except *nutrix* in the coloration of the abdomen and of the lower surface of the hindwing. In *unica* and *nutrix* the dorsum of the abdomen is completely orange or orange with a dark line or linear series of spots, but in the other species the orange coloration is absent or present only at the tip of the abdomen. *G. unica* lacks

the white costal streak that is present on the forewing of *nutria*. The lower surface of the hindwing of *unica* is completely pale yellow, but the other species have some black or dark brown below. Length of forewing: Male, 16 to 17 mm.; female, 17 to 19 mm.

Type.—In the United States National Museum.

Type locality.—Indian River, Fla.

Food plants.—*Annona glabra* (pond-apple, bagá) and *squamosa* (sugar-apple, anón).

Distribution.—FLORIDA. Royal Palm State Park; Florida City; Chokoloskee; Indian River; Paradise Key; Palm Beach; Miami; Coconut Grove. CUBA. *Oriente*: Cuabitas, Santiago de Cuba.

Method of determination.—Examination of the type.

Gonodonta fulvangula Geyer

(Pls. 5, A; 7, E)

Gonodonta fulvangula Geyer, 1832, in Hübner, Zuträge zur Sammlung Exotischer Schmetterlinge, Viertes Hundert, p. 32, figs. 737, 738. — Guénee, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 367. — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 952. — Jones, 1882, Liverpool Lit. and Phil. Soc. Proc. 36: 375.

Athysania chrysotornus Hampson, 1926, New Genera and Species of Noctuínae in the British Museum, p. 372. [New synonymy.]

In this species the orange coloration of the tornus of the forewing is produced into a diffuse transverse line parallel to and immediately distad of the postmedial band. No other known species of the genus have such coloration. *G. fulvangula* is illustrated in Seitz ([1919-46], pl. 90 [1940-46], row f) as "nitidimacula." In that illustration the production of the orange from the tornus is only faintly indicated. Length of forewing: Male, 16 to 20 mm.; female, 17 to 20 mm.

Types.—The location of the type is unknown. I have not been able to ascertain whether it is in the Hofmuseum in Vienna, Austria. The type of *G. chrysotornus* (Hampson) is in the British Museum (Natural History).

Type localities.—*G. fulvangula* was described from a specimen from "Monte Video." The type of *chrysotornus* is from Demerara, British Guiana.

Food plant.—According to Jones (1882, p. 375), the food plant is *Araticú*. This name refers to species of *Annona* and possibly to *A. montana*.

Distribution.—Thirty-five specimens have been examined. They are from the following localities: MÉXICO. *Veracruz*: Jalapa; Coatepec; Paso de San Juan. PANAMÁ. *Canal Zone*: Barro Colorado Island. COLOMBIA. *Magdalena*: El Banco, Magdalena Valley. BRASIL. *Santa Catarina*: Hansa Humbolt. *Rio de Janeiro*: Itatiaia. BRITISH GUIANA. *Essequibo*: Kartabo. "British Guiana." VENEZUELA. *Aragua*: Rancho Grande; Route Maracay-Choroní, Km. 25. *Carubobo*: Las Quiguas, San Esteban Valley; Valle del Río Borburata. *Distrito Federal*: Route Caracas-Colonia Tovar, Km. 16.5. *Bolívar*: Route El Dorado-Santa Elena, Km. 107. TRINIDAD. "Trinidad."

Method of determination.—A specimen identified by means of the original description and illustration was compared with the type of *G. chrysotornus* (Hampson) by D. S. Fletcher.

Gonodonta walkeri, new species

(Pls. 4, J; 7, G)

Head lighter than thorax, scales white, those at vertex tipped with yellowish brown; outer surface of palpi mostly yellowish brown; third segment, dorsal margin of second segment, and inner surface of palpi white; vestiture of patagia, tegulae, and thorax mostly of hairlike orangish-brown scales, but also with some broad, gray, pale-tipped scales; abdomen gray dorsally, white or straw yellow ventrally. Termen of forewing weakly rounded in male, apex weakly acuminate, termen more strongly rounded in female; tooth at tornus large; scale tooth at inner margin small; fringe even, unicolorous from apex to tornus; anterior part of forewing orangish brown, without distinct transverse lines, except outer elements of postmedial band; apical part of forewing distad of postmedial band slightly lighter than remainder of wing; posterior part of wing between fold and inner margin mostly brick red; tornus orange with fine reddish lines; veins immediately basad of postmedial band reddish brown; basal line of antemedial band bordered by fine opalescent line at fold; fold distinct, lighter than contiguous areas of wing; outer elements of postmedial band consisting of straight reddish line followed by broken reddish line, latter bordered with brassy-yellow scales; reniform rather vague, dark point at middle of basal margin; middle of costa with fine short line of opalescent scales. Hindwings entirely fuscous. Underside of forewing fuscous, paler toward termen; costal margin dull orange; tip of tornus brown. Underside of hindwing with veins and fringe straw yellow; diffuse fuscous marginal band present; median area, except veins, straw yellow suffused with fuscous coloration. Length of forewing: Male, 18 to 19 mm.; female, 19 to 20 mm.

Type.—Holotype, female, Sitio [Sitio de Avance (?)], Costa Rica, June, Type No. 63455, Schaus and Barnes; 1 female paratype, Juan Viñas, Costa Rica, June, Schaus and Barnes; in the United States National Museum. One female paratype, Yunga del Espíritu Santo, Cochabamba, Bolivia, 1888-89, P. Germain; 1 male paratype, Ilha Grande, Bahia, Brasil, October 1900, P. de la Garde; 1 male paratype, Castro, Paraná, Brasil; 1 female paratype, Moyobamba, Perú, 1888, M. de Mathan; in the British Museum (Natural History).

Food plant.—Unknown.

Distribution.—As given for the type series.

Remarks.—*G. walkeri* resembles *amianta* and *pseudamianta*, but it is larger and has an opalescent line bordering the basal line of the antemedial band in the fold of the forewing. The latter character, the size, and general habitus make me believe that this species is closely related to *fulvangula*. However, the latter species has a pale area on the hindwing and the orange coloration of the tornus is projected into a transverse line.

Gonodonta amianta (Hampson), new combination

(Pl. 4, A)

Athysania amianta Hampson, 1924, Ann. and Mag. Nat. Hist., Ser. 9, 13: 435. — Kaye and Lamont, 1927, Trinidad and Tobago Dept. Agr. Mem. 3, p. 46.

G. amianta may be separated from the other species of the *chorinea* group that have the head lighter in color than the thorax and lack a distinct pale area on the hindwing by the following combination of characters of the forewing: Ground color orangish brown, without distinctly contrasting fold, Cu_2 not reddish brown, no reddish striae between veins basad of postmedial band, subterminal line serrate, and serrations rounded or truncate distally. Length of forewing: Female, 17 to 18 mm.

Type.—In the British Museum (Natural History).

Type locality.—Demerara, British Guiana.

Food plant.—Unknown.

Distribution.—I have seen only two specimens of this species. They are from Saint-Laurent, French Guiana.

Method of determination.—A specimen agreeing with the original description was compared with the type by D. S. Fletcher.

Gonodonta pseudamianta, new species

(Pls. 4, D; 7, C)

Head lighter than thorax, scales elongate, white, tipped with yellow or yellowish brown; outer surfaces of palpi yellowish brown, third segment and apex of second segment slightly paler; vestiture of patagia, tegulae, and thorax mostly of hairlike orangish-brown scales, but with some intermixed, broad, gray, opalescent-tipped scales; abdomen gray dorsally, white or straw yellow ventrally; slightly depressed tufts of gray setae on metathorax and first two abdominal tergites. Outer margin of forewing rounded; tooth at tornus moderate; scale tooth of inner margin small; fringe even, unicolorous, except at tornus; anterior part of forewing orangish brown, without distinct transverse lines, except outer elements of postmedial band; apical part, except fringe, more or less concolorous with median part of wing; reniform vague, dark point at middle of basal margin; fold distinctly marked with opalescent scaling and bordered anteriorly by vein Cu_2 , which is dark reddish brown; tornus and scale tooth of inner margin orange, tornus with some fine reddish-brown lines; antemedial band distinctly marked only between fold and inner margin, elements consist of two parallel dark reddish-brown lines; postmedial band with only outer elements, straight reddish-brown transverse line followed distally by fine line of opalescent scales clearly indicated; subterminal line only slightly darker than ground color, serrate; black marginal point in fold. Hindwing entirely fuscous or with vague orange median area; fringe pale, suffused with fuscous toward base. Underside of forewing fuscous, except for orange along costa, pale fringe and brown marks at end of tooth at tornus. Underside of hindwing com-

pletely fuscous or straw yellow, with broad marginal band of fuscous and longitudinal fuscous streaks extending from marginal band toward base in spaces caudad of Sc, M₁, and Cu₂. Length of forewing: Male and female, 16 mm.

Type.—Holotype, male, San Estevan, near Puerto Cabello, Venezuela, "6-71877" [June and July 1877 (?)], Hahnel de Sagan; 3 female paratypes, La Chima, Province los Ríos, Ecuador, "1" Semestre, 1893," Marc de Mathan; in the British Museum (Natural History). One female paratype, "Sto. Paulo d'Oliveira," Amazonas, Brasil, "Juin, Juillet, 1883," Marc de Mathan; 1 female paratype, La Chima, Province los Ríos, Ecuador, "1" Semestre, 1893," Marc de Mathan; in the United States National Museum.

Food plant.—Unknown.

Distribution.—As indicated for the type series.

Remarks.—*G. pseudamianta* is very similar in general habitus to *amianta*, but it may be separated from that species by its distinctly contrasting fold, reddish-brown vein Cu₂ of the forewing, and differences in the subterminal line and the outer elements of the postmedial band. *G. incurva*, especially specimens without the pale area of the hindwing, also resembles this species, but *incurva* has reddish intervenular striae basad of the postmedial band.

Gonodonta incurva (Sepp)

(Pls. 5, B-D; 7, D)

Phalacna incurva Sepp, 1832-40,¹² Surinaamsche Vlinders, v. 2, p. 201, pl. 89.
Gonodonta incurva (Sepp). — Walker, 1858, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 15, p. 1790. — Möschler, 1878, Stettin. Ent. Ztg. 39: 437. — Butler, 1894, Entomologist 27: 213. — Hampson, 1898, London Ent. Soc. Trans., p. 253. — Swainson, 1901, N. Y. Ent. Soc. Jour. 9: 81. — Schaus, 1940, Scientific Survey of Porto Rico and the Virgin Islands, v. 12, pt. 2, p. 258. — Fennah, 1942, The Citrus Pests Investigation in the Windward and

¹² The date for this description has been listed as 1850, 1850?, or the date has not been cited. The Catalogue of the Books, Manuscripts, Maps and Drawings in the British Museum (Natural History), 1913, volume 4, page 1902, gives dates for the first 5 parts of volume 1 and states that the last part or parts were completed in 1848, referring to the date at the end of the preface of volume 1, "Junij, 1848." The preface of volume 2 is not dated, and the British Museum Catalogue states that the date is unknown. It also states that volume 3 was completed in 1855. That volume has the preface dated "11 November 1852."

To ascertain the date of publication of volume 2, which contains the description of *G. incurva* (Sepp), I discovered that "Sepp, Histoire Naturelle des Insectes de Surinam, 3 parts," was listed in the Transactions of the Entomological Society of London, New Series, 1854, volume 2, page xiii, under the title "Additions to the Library. From the 1st January, 1852, to the 31st Decemboer, 1853." Since I could not determine whether the 3 parts referred to volumes, I wrote to A. Diakonoff of Leiden, Netherlands. He informed me that according to the librarian of the Library of the Teyler's Foundation, Haarlem, Netherlands, the exact date of receipt could be determined from old bills of receipt for all 38 parts of the entire work, except those containing the description in question. Even so, Diakonoff is certain from available information that pages 201-202 must have been published between 1832 and December 18, 1840.

Leeward Islands, British West Indies, 1937-1942, pp. 54-55. — Bruner, Scaramuzza, and Otero, 1945, Cuba Estac. Expt. Agron. Bol. 63, pp. 50, 140, 145. — Ebeling, 1950, Subtropical Entomology, pp. 533, 539. — Wolcott, (1948) 1951, Puerto Rico Univ. Jour. Agr. 32: 617.

Gonodonta temperata Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 957. — Butler, 1894, Entomologist 27: 213, [synonym of *incurva* (Sepp)].

Gonodonta teretimacula Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 367. — Herrich-Schäffer, 1868, Corresp.-Blatt Zool.-Min. Ver. Regensburg (Naturw. Ver. Regensburg) 22: 184. — Möschler, 1880, Zool.-Bot. Gesell. Wien, Verhandl. 30: 393. — Gundlach, 1881, Contribución á la Entomología Cubana, Lepidopteros, v. 1, p. 333. — Stahl, 1883, Fauna de Puerto Rico, Catálogo del Gabinete Zoológico, p. 194. — Druce, 1887, in Godman and Salvin, Biología Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 253. — Möschler, 1890, Senckenb. Naturf. Gesell. Abhandl. 16: 183. — Gundlach, 1891, Soc. Españ. de Hist. Nat. Ann. 20: 189. — Butler, 1894, Entomologist 27: 213, [synonym of *incurva* (Sepp)]. — Wolcott, 1924, Porto Rico Dept. Agr. Jour. 7: 176. — Viette, 1951, Soc. Linn. de Lyon, Bul. Mens. 20: 161.

Gonodonta dentata Felder and Rogenhofer, 1872, Reise der Österreichischen Fregatte Novara um die Erde, Zoologischer Theil, v. 2, Abt. 2, Atlas, Inhalts-Verzeichniss Heterocera, p. 10, pl. 111, fig. 14. — Druce, 1887, in Godman and Salvin, Biología Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 253, [synonym of *teretimacula* Guénéé].

Gonodonta elaborans Dyar, 1914, U. S. Natl. Mus. Proc. 47: 425. [New synonymy.]

Gonodonta velata Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 957. — Druce, 1887, in Godman and Salvin, Biología Centrali-Americana, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 253, [synonym of *teretimacula* Guénéé]. — Butler, 1894, Entomologist 27: 213, [synonym of *incurva* (Sepp)].

Gonodonta soror Guénéé.¹⁰ — Stahl, 1883, Fauna de Puerto Rico, Catálogo del Gabinete Zoológico, p. 194. [Specimen 74-90 from Puerto Rico, now in the collection of the United States National Museum, was identified under this name by Stahl.]

The reddish striae between the veins basad of the postmedial band separate this species from all others of the genus. The amount of orange on the hindwing is variable, but the orange never reaches the costa of the wing. In some specimens the hindwings are completely fuscous. *G. incurva* is illustrated in color in Seitz ([1919-46], pl. 90 [1940-46], row i) as "teretimacula." Length of forewing: Male, 16 to 20 mm.; female, 17 to 20 mm.

Types.—The location of the type of *incurva* is unknown and it is presumed to be lost. The lectotype of *teretimacula* selected by Viette (1951, p. 161) is in the Muséum National d'Histoire Naturelle, Paris, France. The types of *dentata*, *temperata*, and *velata* are in the British Museum (Natural History). The type of *elaborans* is in the United States National Museum.

Type localities.—The types were from the following localities: *G. incurva*, "Suriname"; *dentata*, "Amazonas"; *temperata*, "Venezuela"; and *elaborans*, "Dominica." The lectotype of *teretimacula*

¹⁰ It is not known whether Guénéé was a lapsus for (Cramer) or whether Stahl intended to indicate that he believed his specimen or specimens were the *G. soror* (Cramer) of Guénéé.

is stated to be from "Cayenne." Walker did not know the source of the specimens of *velata*, on which he based his description.

Food plants.—*Pothomorphe peltata* (caisimón), *Piper* sp. (platanillo de Cuba), and *Ocimum* sp. (basil).

Distribution.—One hundred and nineteen specimens from the following localities have been examined: MÉXICO. Veracruz: Orizaba; Jalapa; Presidio. "Mexico." GUATEMALA. Izabal: Cayuga. Baja Verapaz: Chejel. Retalhuleu: San Sebastián. HONDURAS. Alántida: Tela. COSTA RICA. Cartago: Juan Viñas. BOLIVIA. Gutierrez: "Prov. del Sara." PARAGUAY. "Paraguay." BRASIL. Distrito Federal: Rio de Janeiro. "Brazil." BRITISH GUIANA. Essequibo: Tumatumari, Potaro River. VENEZUELA. Yaracuy: Aroa. Aragua: Rancho Grande; Route Maracay-Choroní, Km. 25. Mérida: Mérida. Miranda: San Antonio, near Los Teques. Carabobo: Las Quiguas, San Esteban Valley. Trujillo: Caravajal. Bolívar: Route El Dorado-Santa Elena, Km. 107. GRENADA. "Grenada." SAINT VINCENT. "St. Vincent." SAINT LUCIA. Castries. DOMINICA. Ridgefield; "Dominica." NEVIS ISLAND. South side of Mt. Nevis. PUERTO RICO. Mayagüez; "P. R." REPÚBLICA DOMINICANA. San Lorenzo. JAMAICA. Constant Spring; Baron Hill, Trelawny; Bath; Moneague; Great Valley, Hanover; Troy; Claremont; Cumberland District, Clarendon; Port Antonio; "Jamaica." CUBA. Habana: Santiago de las Vegas. Matanzas: Matanzas. Oriente: Baracoa. Las Villas: San Blas. "Cuba." FLORIDA. Pinellas County: St. Petersburg. Hillsborough County: Vicinity of Tampa.

Method of determination.—This species was identified from the original description and illustration. Verification of the synonymy of the species, the types of which are in the British Museum, was accomplished through the assistance of D. S. Fletcher. The new synonymy of *elaborans* was determined through examination of the type.

Remarks.—Adults have been observed feeding on oranges, grapefruit, and governor's plum (*Flacourtia ramontchi*).

Gonodonta nitidimacula Guénéé

(Pls. 3, E-F; 6, N)

Gonodonta nitidimacula Guénéé, 1852, Histoire Naturelle des Insectes, Species Général des Lépidoptères, v. 6 (Noctuérites II), p. 368, pl. 12, fig. 5 (1858). — Walker, 1857, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, pt. 12, p. 948. — Wolcott, 1924, Porto Rico Dept. Agr. Jour. 7: 176; 1927, Entomologie d'Haiti, p. 289. — Schaus, 1940, Scientific Survey of Porto Rico and the Virgin Islands, v. 12, pt. 2, p. 258. — Martorell, (1945) 1948, Puerto Rico Univ. Jour. Agr. 29: 511, pl. 13. — Wolcott, (1948) 1951, Puerto Rico Univ. Jour. Agr. 32: 617.

Gonodonta latimacula, auct. nec Guénéé, Herrich-Schäffer, 1868, Corresp.-Blatt Zool.-Min. Ver. Regensburg (Naturw. Ver. Regensburg) 22: 185. — Gundlach, 1881, Contribución á la Entomología Cubana, Lepidopteros, v. 1, p. 336. — Möschler, 1890, Senckenb. Naturf. Gesell. Abhandl. 16: 183. — Gundlach, 1891, Soc. Españ. de Hist. Nat. Ann. 20: 189. — Wolcott, 1924, Porto Rico Dept. Agr. Jour. 7: 176. — Bruner, Scaramuzza, and Otero, 1945, Cuba Estac. Expt. Agron. Bol. 63, p. 140. [The author concurs with Schaus (1940, p. 258), who treated these references to *latimacula* as misidentifications of *nitidimacula*.]

G. nitidimacula may be separated from the other species of the *chorinea* group that have some of the veins basad of the postmedial band darker than the contiguous areas of the wing by the presence of a pale area on the hindwing and/or the presence of a prominent gray (brassy yellow in certain aspects) shade immediately distad of the postmedial band. The illustration in Seitz ([1919-46], pl. 90 [1940-46], row f) as "nitidimacula" is not of this species but refers to *fulvangula*. Length of forewing: Male, 15 to 18 mm.; female, 16 to 20 mm.

Type.—The species was originally described from three specimens from the collections of Boisduval and Guénée. One of the syntypes, a female, is in the British Museum (Natural History), and it has been selected and labeled lectotype by D. S. Fletcher. In addition to the lectotype label, the specimen bears the following data: "Gonod. Nitidimacula Gn., Sp. 1213, Ile St. thomas?"

Type locality.—As indicated above.

Food plants.—*Piper* sp. (platanillo de Cuba), *Piper amalago* or *medium* (soot soot, higuillo de limon).

Distribution.—Forty-one specimens have been studied. They are from the following localities: MÉXICO. *Veracruz*: Jalapa; Orizaba; Córdoba. *Tabasco*: Teapa. GUATEMALA. *Izabal*: Cayuga. *Baja Verapaz*: Chejel. VENEZUELA. *Yaracuy*: Aroa. *Aragua*: Pozo Diablo, El Limón; Rancho Grande; Route Maracay-Choroní, Km. 25. *Miranda*: San Antonio, near Los Teques. *Carabobo*: Las Quiguas, San Esteban Valley; Valle del Río Borburata. *Mérida*: Mérida. VIRGIN ISLANDS. *St. Croix*: Christiansted; Kingshill. PUERTO RICO. Cayey; Manati; Rio Piedras; "P. R." REPÚBLICA DOMINICANA. San Lorenzo. JAMAICA. Mandeville; Claremont. CUBA. *Habana*: Santiago de las Vegas. *Oriente*: Río Turquino.

Method of determination.—A specimen agreeing with the original description was sent to D. S. Fletcher, and he compared it with the specimen selected as lectotype.

Gonodonta latimacula Guénée

(Pls. 3, H-J; 6, M)

Gonodonta latimacula Guénée, 1852, *Histoire Naturelle des Insectes, Species Général des Lépidoptères*, v. 6 (Noctuérites II), p. 367. — Walker, 1857, *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum*, pt. 12, p. 953. — Schaus, 1940, *Scientific Survey of Porto Rico and the Virgin Islands*, v. 12, pt. 2, p. 258.

This species is closely related to *primulina*, but it may be distinguished from it by the outer line of the postmedial band, which is nearly straight and not convex distally; by the coloration of the tornus, which is not concolorous with the median area of the forewing; and by the antemedial band, which appears as a brick-red line margined with faint opalescent scaling basally in the area of the fold of the wing. These two species have the median area of the forewing either mostly straw yellow or with a diffuse streak of straw yellow extending from the basal area above the fold to the costa above the reniform. The other species of the *chorinea*

group that agree with these species in the coloration of the head and hindwings either lack the straw-yellow coloration in the forewings or, if present, the color is not located as indicated above. The size of the pale area of the hindwing is extremely variable in *latimacula*. (See pl. 3, H-J.) Length of forewing: Male, 17 to 20 mm.; female, 17 to 21 mm.

Type.—One of the syntypes, a male, now in the British Museum (Natural History), has been selected and labeled "lectotype" by D. S. Fletcher. In addition, the specimen is labeled "Gonod. *Latimaculata* Gn. Spec. 1212. Columbia." The spelling of the specific name on this label is obviously a lapsus.

Type locality.—As indicated above.

Food plant.—Unknown.

Distribution.—Thirty-four specimens have been studied. They are from the following localities: MEXICO. *Veracruz*: Córdoba. *Chiapas*: La Florida. GUATEMALA. *Izabal*: Cayuga. HONDURAS. *Alántida*: Lancetilla, Tela. COSTA RICA. *Limón*: Río Sixaola. *Puntarenas*: Palmar. PANAMÁ. *Canal Zone*: Barro Colorado Island. COLOMBIA. *Valle del Cauca*: Yuntas, near Cali. *Cundinamarca*: Bogotá. PERÚ. *Loreto*: Iquitos. BRAZIL. *Santa Catarina*: Blumenau; Neu Bremen; "St. Catherines." *Pará*: Belém. *Espírito Santo*: "Espírito Santo." "Brazil." FRENCH GUIANA. Cayenne. BRITISH GUIANA. *Demerara*: Georgetown. *Essequibo*: Omai. VENEZUELA. *Carabobo*: Valle del Río Borburata. *Aragua*: Rancho Grande. *Bolívar*: Route El Dorado-Santa Elena, Km. 107. TRINIDAD. "Trinidad."

Method of determination.—A specimen agreeing with the original description was sent to D. S. Fletcher, and he compared it with the specimen selected as lectotype.

Remarks.—Schaus (1940, p. 258) stated that the specific name "*latimacula*" has been applied to *nitidimacula* by several lepidopterists in their papers on the Lepidoptera of the West Indies and that *latimacula* is not known to occur in that area.

Gonodonta primulina Druce

(Pls. 2, I-J; 6, J)

Gonodonta primulina Druce, 1887, in Godman and Salvin, *Biologia Centrali-Americana*, Insecta, Lepidoptera, Heterocera, v. 1, pt. 60, p. 255; v. 3, table 25, fig. 15.

G. primulina differs from all the other species of the *chorinea* group, except *latimacula*, in that the median area of the forewing is mostly a pale straw yellow. This species may be separated from *latimacula* by the following characters: Tornus pale, more or less concolorous with median area of forewing; outer line of postmedial band convex distally; antemedial band of forewing in area of fold appearing as pair of short, thin, parallel, white lines. In addition to the illustration accompanying the original description, this species is illustrated in color in Seitz ([1919-46], pl. 90 [1940-46], row f) as "*primulina*." Length of forewing: Male, 17 to 21 mm.; female, 20 to 24 mm.

Type.—D. S. Fletcher has selected and labeled one of the syn-

types as lectotype. It bears three additional labels as follows: "Panima Vera Paz Champion," "Godman-Salvin Coll. 98-40 B. C. A. Lep. Het. Gonodonta primulina Type Sp. figured," and "Gonodonta primulina Druce Type." The lectotype is in the British Museum (Natural History).

Type locality.—Panima, Verapaz, Guatemala.

Food plant.—Unknown.

Distribution.—Seventeen specimens from the following localities have been examined: MEXICO. Veracruz: Misantla. GUATEMALA. Alta Verapaz: Cahabón. COSTA RICA. Cartago: Juan Viñas; Orosi. Volcán Irazú. COLOMBIA. Cundinamarca: Cananche. "Colombia." ECUADOR. Loja: Loja. PERÚ. Madre de Dios: Chanchamayo. BOLIVIA. Cochabamba: Cochabamba. VENEZUELA. Carabobo: Valle del Río Borburata. Aragua: Rancho Grande. "Venez."

Method of determination.—A specimen agreeing with the original description and the accompanying illustration was compared with the selected lectotype by D. S. Fletcher.

UNRECOGNIZED SPECIES

Gonodonta soror (Cramer)

Phalaena {*Noct.* {*ua* } *soror* Cramer, 1780, De Uitlandsche Kapellen Voorkomende in de Drie Waereld-Deelen Asia, Africa en America (Papillons Exotiques, des Trois Parties du Monde, l'Asie, l'Afrique et l'Amérique), v. 3, p. 150, pl. 276, fig. B.

This name has been applied by some lepidopterists to the species treated in this bulletin as *G. bidens bidens* Geyer. The illustration accompanying the original description of *soror* resembles *bidens* more than any of the other known species of the genus, but it differs in so many respects that I do not believe it should be recognized as that species. The type appears to be lost, at least it is not in the Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands, with other Cramer types. Furthermore, the name has been often incorrectly applied to several other species. Therefore, it is my opinion that *soror* should be treated as an unrecognized species.

I have also been unable to recognize the species identified as *soror* by the following authors: Druce, 1887, in Godman and Salvin, *Biologia Centrali-Americana, Insecta, Lepidoptera, Heterocera*, v. 1, pt. 60, p. 254, and Hampson, 1898, *London Ent. Soc. Trans.*, p. 253.

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INDEX TO THE SPECIES AND SUBSPECIES

(Synonyms are in italics)

	Page		Page
<i>acneptera</i> (Sepp) -----	24	<i>lecha</i> Schaus -----	18
<i>aequalis</i> Walker -----	30	<i>lincus</i> (Cramer) -----	25
<i>amianta</i> (Hampson) -----	44	<i>maria</i> Guénée -----	35
<i>avangareza</i> Schaus -----	35	<i>marmorata</i> Schaus -----	26
<i>biarmata</i> <i>biarmata</i> Guénée ----	19	<i>meridionalis</i> Todd (See <i>bidens</i> .)	
<i>biarmata</i> <i>galapagensis</i> Todd ---	20	<i>mexicana</i> Schaus -----	12
<i>bidens</i> <i>bidens</i> Geyer -----	38	<i>nitidimacula</i> Guénée -----	47
<i>bidens</i> <i>meridionalis</i> Todd -----	39	<i>nutrix</i> (Cramer) -----	23
<i>bidens</i> <i>tenebrosa</i> Todd -----	40	<i>panoana</i> (Schaus) -----	33
<i>choneina</i> (Cramer) -----	29	<i>paraequalis</i> Todd -----	31
<i>chorinea</i> (Cramer) -----	28	<i>parens</i> Guénée -----	32
<i>chrysotornus</i> (Hampson) -----	42	<i>plumbicincta</i> Dyar -----	32
<i>ciotilda</i> (Stoll) -----	36	<i>primulina</i> Druce -----	49
<i>correcta</i> Walker -----	34	<i>pseudamianta</i> Todd -----	44
<i>dentata</i> Felder and Rogenhofer ---	46	<i>pulverea</i> Schaus -----	32
<i>distincta</i> Todd -----	20	<i>pyrgo</i> (Cramer) -----	22
<i>ditissima</i> Walker -----	11	<i>separans</i> Walker -----	18
<i>elaborans</i> Dyar -----	46	<i>serix</i> Guénée -----	22
<i>elegans</i> Druce -----	19	<i>sicheas</i> (Cramer) -----	13
<i>evadens</i> Walker -----	19	<i>sinaldus</i> Guénée -----	15
<i>fernandezi</i> Todd -----	28	<i>sitia</i> Schaus -----	36
<i>flavidens</i> (Hampson) -----	30	<i>soror</i> auct ----- 26, 38, 39,	46
<i>fulvangula</i> Geyer -----	42	<i>soror</i> (Cramer) -----	50
<i>fulvidens</i> Felder and Rogenhofer ---	29	<i>superba</i> Möscher -----	25
<i>galapagensis</i> Todd (See <i>biarmata</i> .)		<i>syrna</i> Guénée -----	14
<i>ginaldus</i> Dyar -----	15	<i>temperata</i> Walker -----	46
<i>hesione</i> (Drury) -----	13	<i>tenebrosa</i> Todd (See <i>bidens</i> .)	
<i>holosericea</i> Guénée -----	11	<i>teretimacula</i> Guénée -----	46
<i>immacula</i> Guénée -----	33	<i>uncina</i> Hübner -----	13
<i>incurva</i> (Sepp) -----	45	<i>unica</i> Neumoegen -----	41
<i>indentata</i> (Hampson) -----	17	<i>uxoria</i> (Cramer) -----	26
<i>latimacula</i> Guénée -----	48	<i>velata</i> Walker -----	46
		<i>walkeri</i> Todd -----	43



A



B



C



D



E



F



G



H



I



J

89-7340X

Adults of *Conodonta* Hübner: A, *pyrgo*; B, *lecha*; C, *biarmata biarmata*; D, *distincta*; E, *sichcas*; F, *ditissima*; G, *syrnu*; H, *syrnu*, dark form; I, *holosericea*; J, *mexicana*.



A



B



C



D



E



F



G



H



I



J

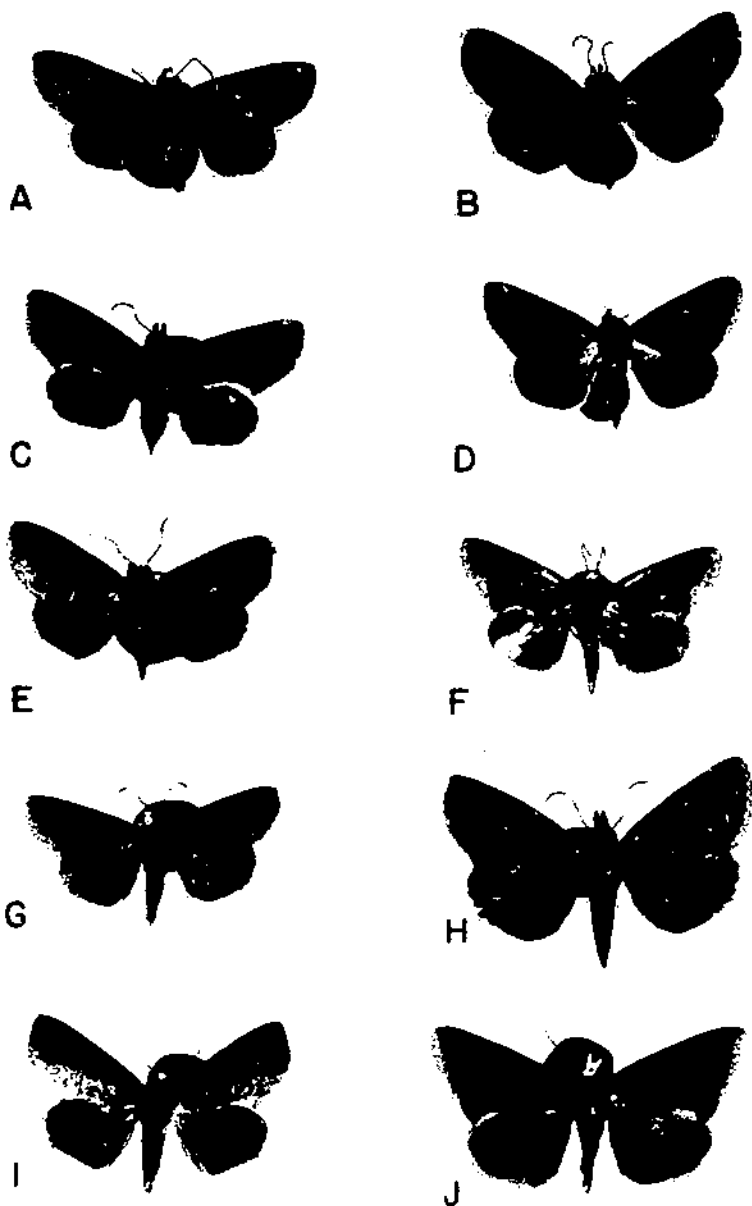
BN-7341X

Adults of *Gonodonta* Hübner: A, *indentata*; B, *unica*; C, *sinaldus*, dark form; D, *sinaldus*; E, *usoria*; F, *lineus*; G, *nutrix*; H, *correcta*; I, *primulina*; J, *primulina*, dark form.



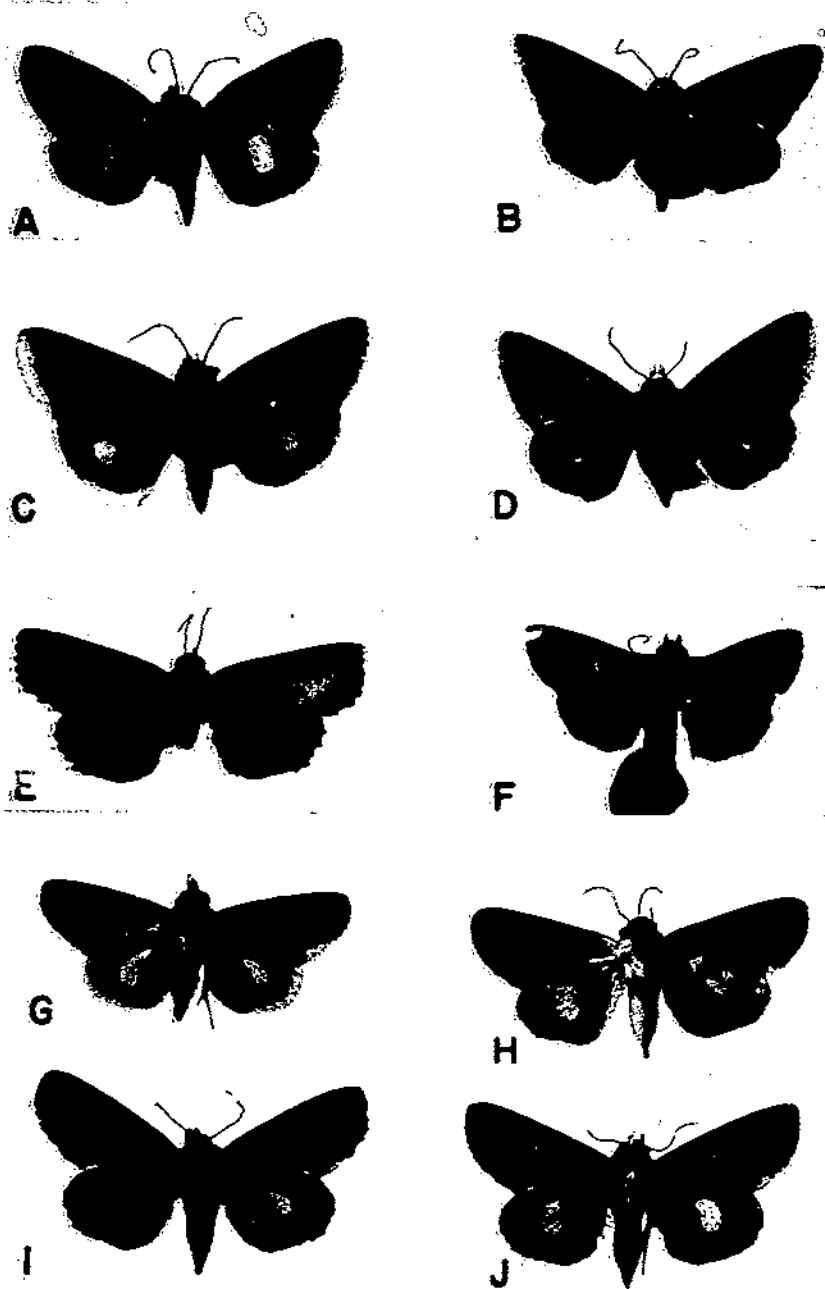
BN 7342X

Adults of *Gonodonta* Hübner: A, *bidens bidens*; B, *bidens tenobrosa*; C, *clatilda*; D, *sitia*; E, *nitidimacula*, median area of forewing with some straw-yellow coloration; F, *nitidimacula*; G, *maria*; H, *latimacula*, dark form; I, *latimacula*; J, *latimacula*, pale form.



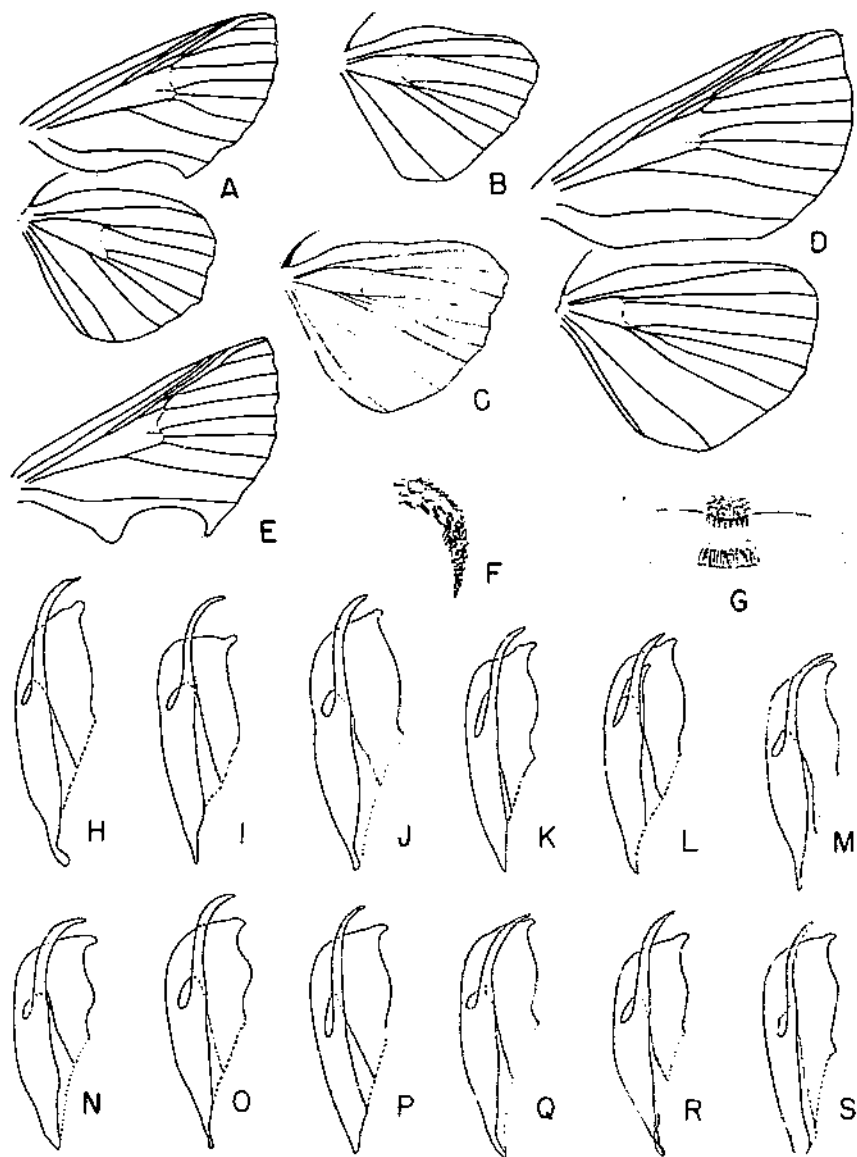
BN 7141X

Adults of *Gonodonta* Hübner: A, *umbinata*; B, *paucus*; C, *fulvidens*; D, *pseudantianta*; E, *innocula*; F, *paraequalis*; G, *aequalis*; H, *choirinea*; I, *pulverea*; J, *walkeri*.



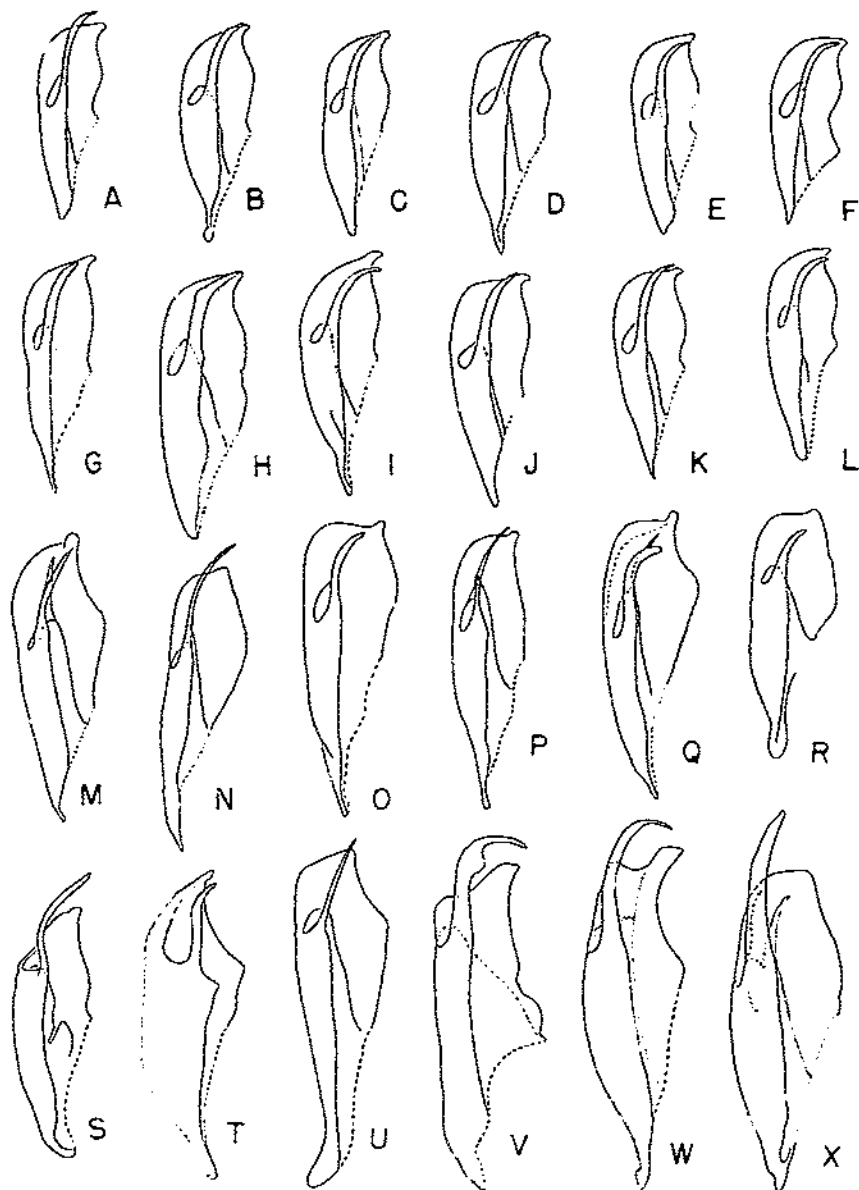
BN-7344X

Dorsal view, A-F, and ventral view, G-J, of adults of *Gomodonia* Hübner: A, *fulvangulara*; B, *incurva*, pale area of hindwing absent; C, *incurva*, pale area of hindwing moderately large; D, *incurva*, pale area of hindwing small; E, *fernandezi*; F, *separans*; G, *bidens bidens*; H, *bidens bidens*, darker specimen; I, *bidens meridionalis*; J, *bidens trabebrusa*.



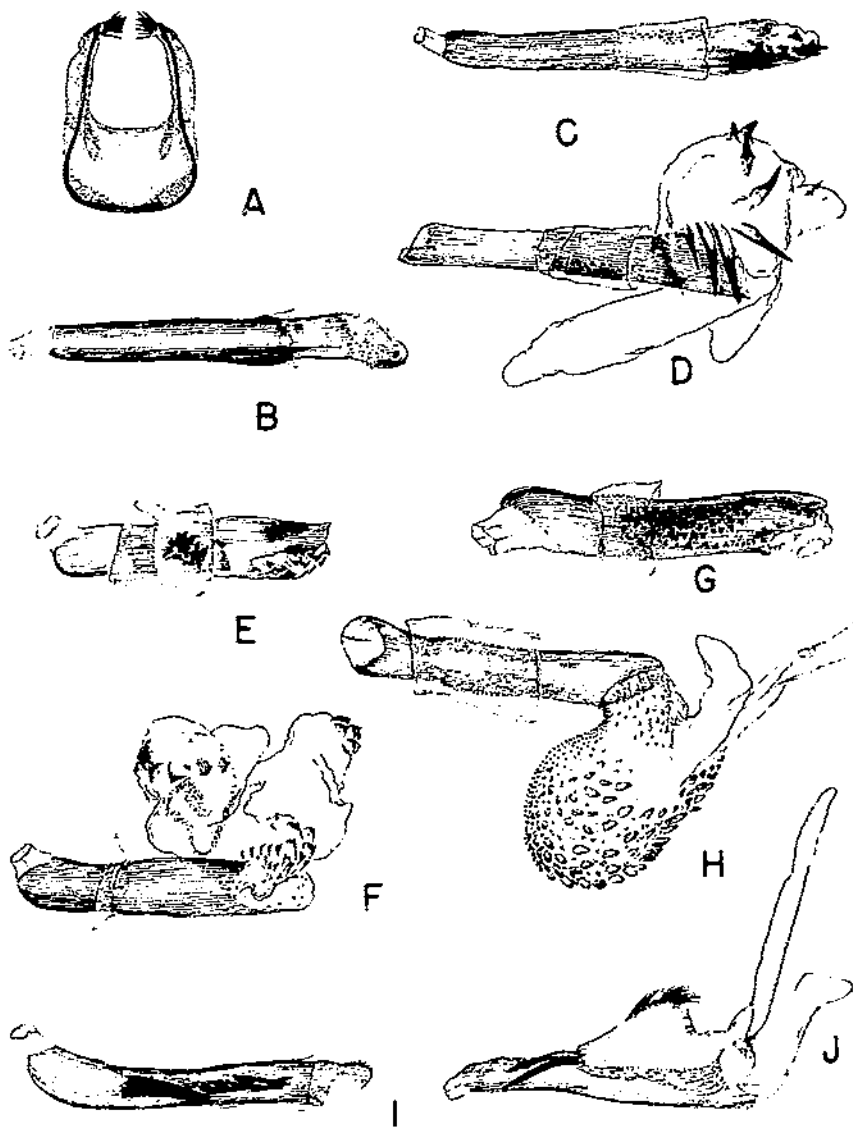
BN 7345X

Wing venation, A-E; end of proboscis, F; specialized scales of abdominal sternites V and VI, G; left valves of male genitalia, H-S; of species of *Gonodonta* Hübner: A, *nutrix*; B, *sinualdis*; C, *syrra*; D, *dilissima*; E, *biarmata biarmata*; F, *bidens tenebrosa*; G, *holosericea*; H, *lincus*; I, *choriuea*; J, *primulina*; K, *silia*; L, *fulvidens*; M, *latimaenta*; N, *nitidimacula*; O, *uxoria*; P, *fernandesi*; Q, *maria*; R, *pulverea*; S, *bidens tenebrosa*.



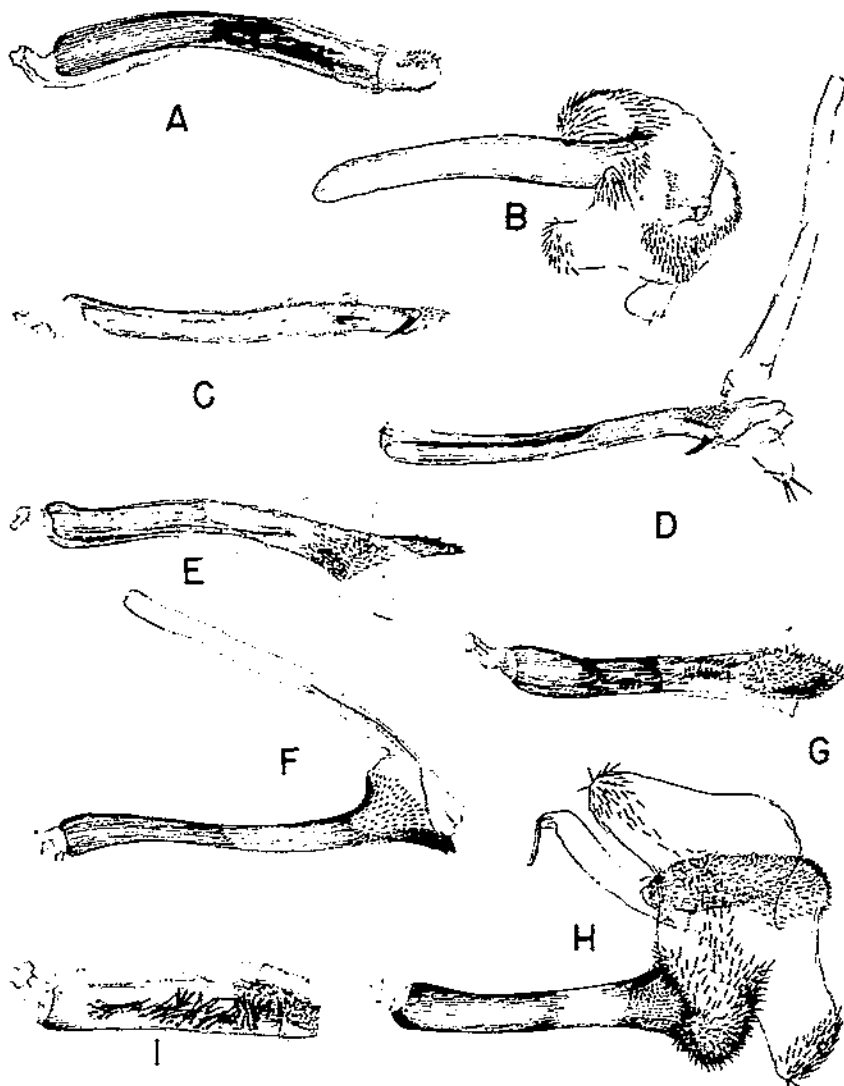
GN 7346X

Left valves of male genitalia of species of *Gonodonta* Hübner: A, *parvus*; B, *aequalis*; C, *pseudamianta*; D, *incurva*; E, *fulvangua*; F, *poraequalis*; G, *walkeri*; H, *correcta*; I, *nutrix*; J, *unica*; K, *immacula*; L, *clotilda*; M, *biarmata biarmata*; N, *lecha*; O, *holosericea*; P, *siclus*; Q, *pyrgo*; R, *indentata*; S, *syrna*; T, *separans*; U, *sinaldus*; V, *distincta*; W, *mexicana*; X, *ditissima*.



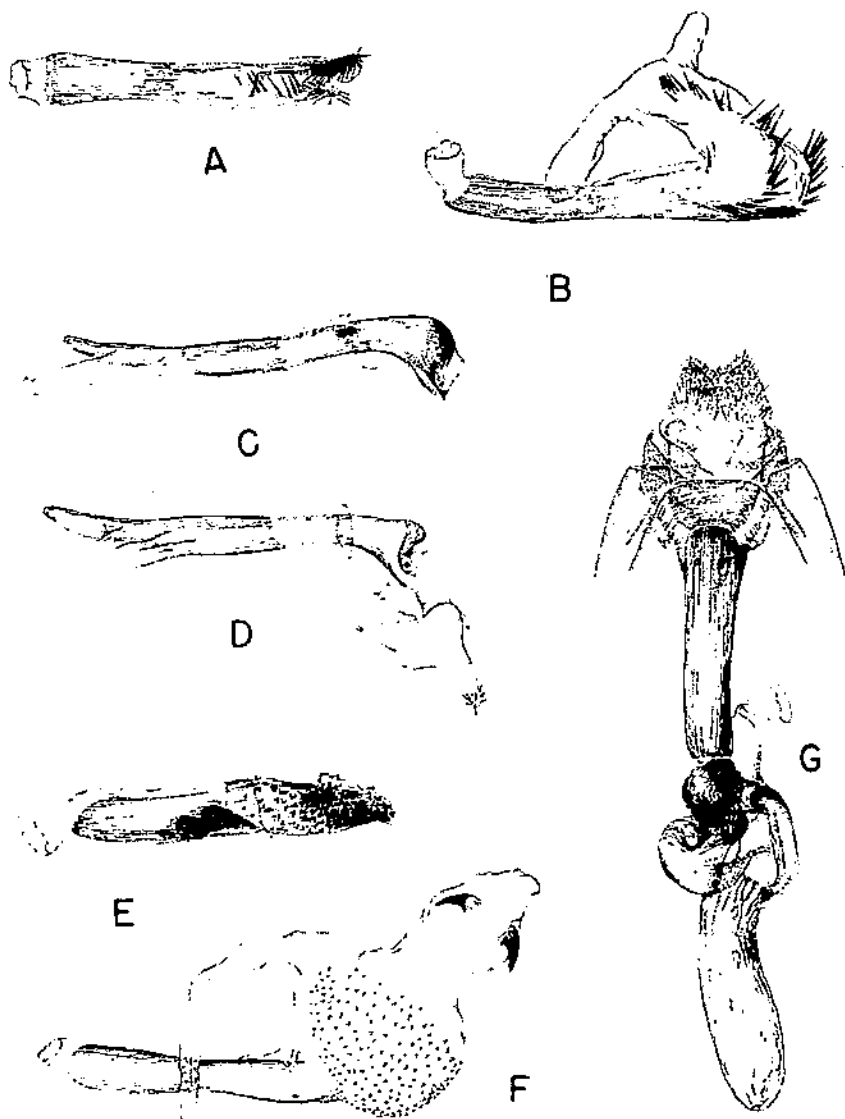
BN 7347X

Male genitalia, juxta, A, and aedeagi (vesica distended, D, F, H, J.), B-J, of species of *Gonodonta* Hübner: A-B, *separans*; C-D, *sicheas*; E-F, *bideus tenebrosa*; G-H, *pyrga*; I-J, *biarmata biarmata*.



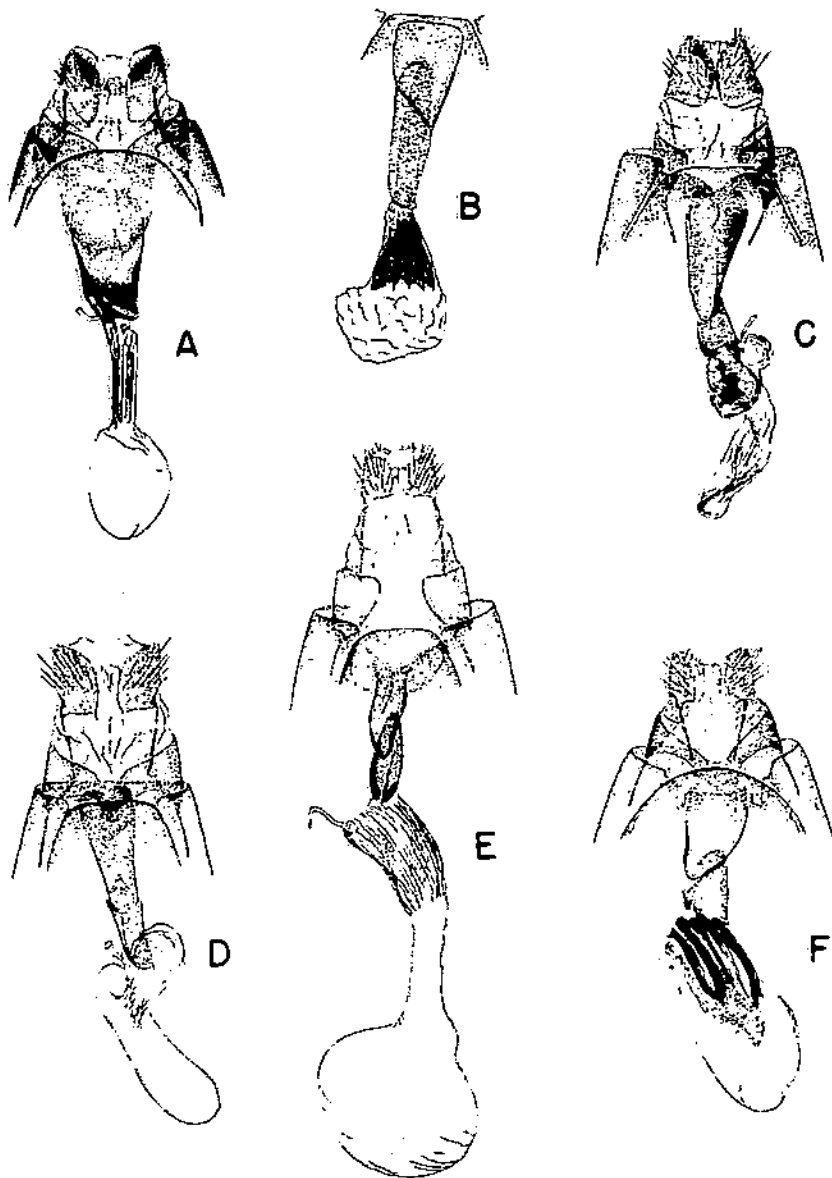
BH 7348X

Aedeagi (vesica distended, B, D, F, H,) of male genitalia of species of *Gonodonta* Hübner: A-B, *sinaldus*; C-D, *syrna*; E-F, *mexicana*; G-H, *lechu*; I, *indentata*.



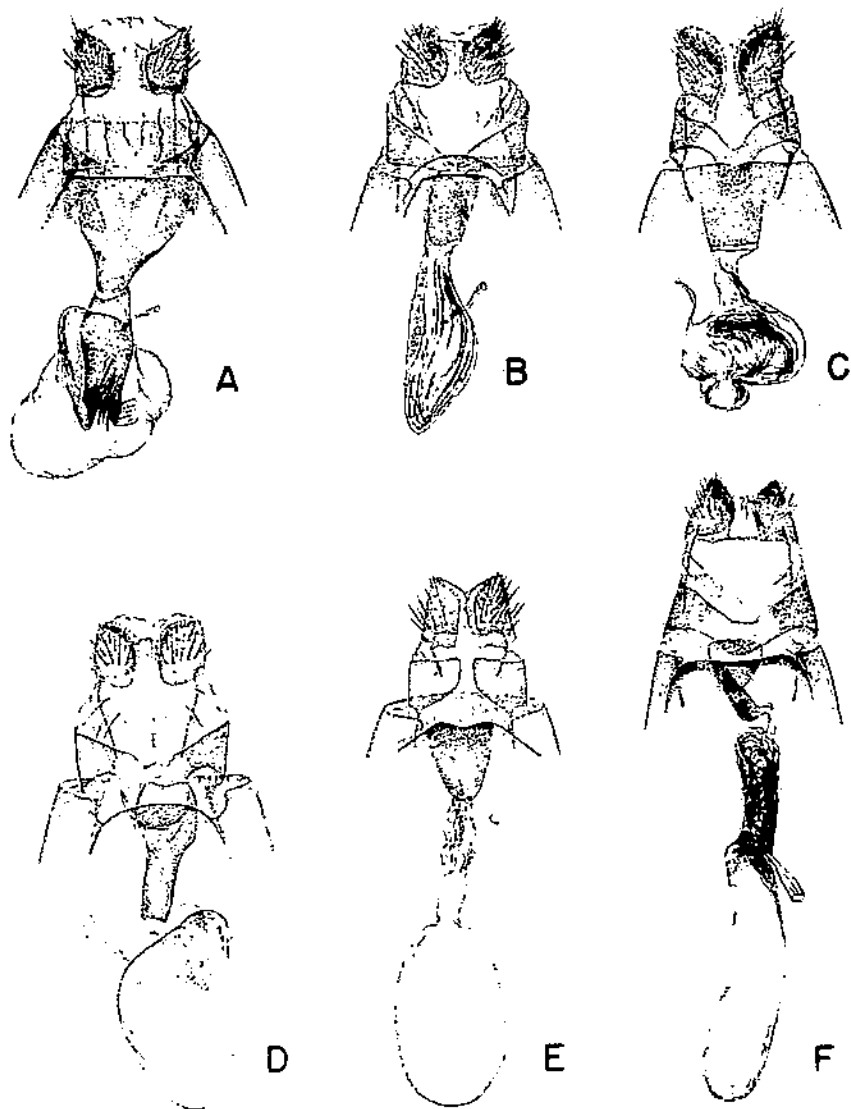
DN 7349X

Aedeagi (vesica distended, *B, D, F,*) of male genitalia, *A-F,* and female genitalia, *G,* of species of *Gonodonta* Hübner: *A-B,* *holosericea*; *C-D,* *distincta*; *E-G,* *dilissima*.



BN-7350X

Female genitalia of species of *Gonodonta* Hübner: A, *distincta*; B, *fulvidens*; C, *biarmata biarmata*; D, *siccas*; E, *mexicanu*; F, *lecha*.



BN-7351X

Female genitalia of species of *Gonodonta* Hübner: A, *simuldas*; B, *bidens tenebrosa*; C, *indentata*; D, *holosericeu*; E, *syna*; F, *pyrgo*.

END