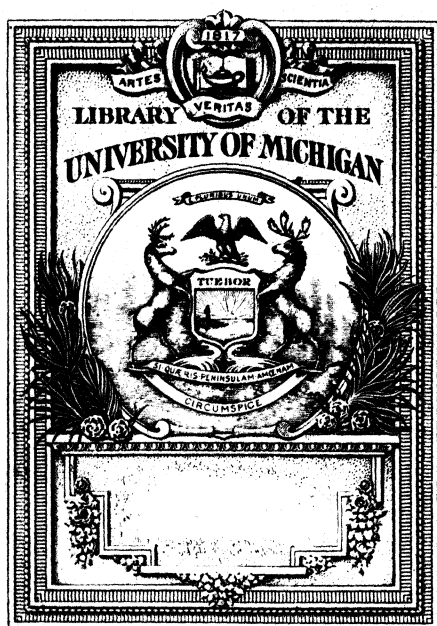


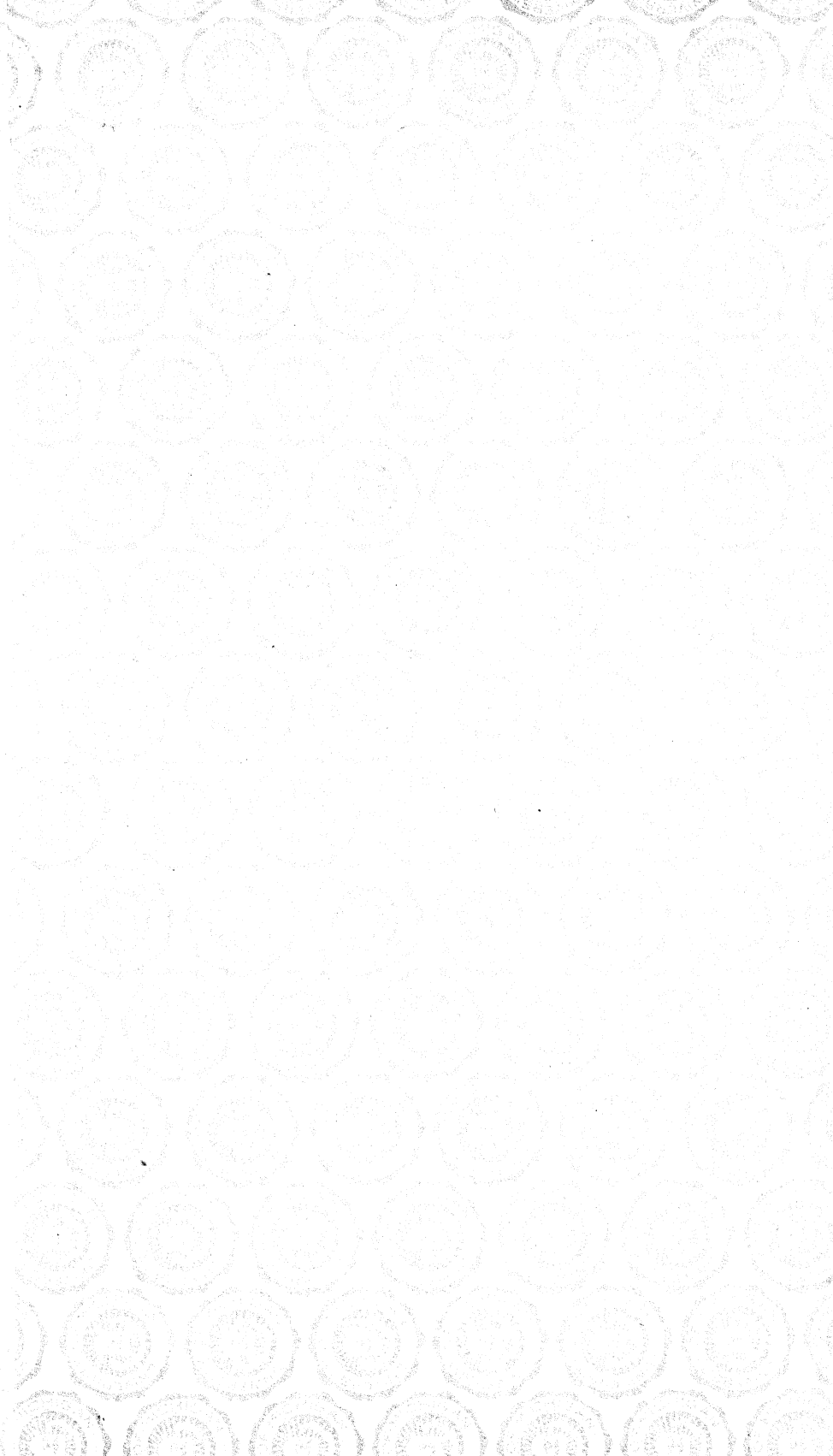
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CONTENTS OF VOLUME IX

	Page
Title-page	i
Contents	iii
Dates of Publication of Parts.....	iii
List of Illustrations.....	iv
Mammals of Porto Rico, Living and Extinct—Chiroptera and Insectivora.	
By H. E. ANTHONY.....	1
Mammals of Porto Rico, Living and Extinct—Rodentia and Edentata.	
By H. E. ANTHONY.....	97
The Birds of Porto Rico and the Virgin Islands—Colymbiformes to	
Columbiformes. By ALEXANDER WETMORE.....	243
The Birds of Porto Rico and the Virgin Islands—Psittaciformes to	
Passeriformes. By ALEXANDER WETMORE.....	409
Index	573

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- Part 4, December 22, 1927.

74

LIST OF ILLUSTRATIONS

FIGURES

	Page
<i>Noctilio leporinus mastivus</i> $\times 2/1$; Old Loiza, Porto Rico.....	14
<i>Chilonycteris parnelli portoricensis</i> $\times 3/1$; adult δ ; Trujillo Alto, Porto Rico	19
<i>Chilonycteris fuliginosa inflata</i> $\times 3/1$; adult δ ; Pueblo Viejo, Porto Rico	22
<i>Mormoops blainvillii</i> $\times 8/3$; adult δ ; Trujillo Alto, Porto Rico.....	26
<i>Mormoops blainvillii</i> $\times 4/1$; adult δ ; Trujillo Alto, Porto Rico.....	27
<i>Monophyllus portoricensis</i> $\times 3/1$; adult δ ; Pueblo Viejo, Porto Rico.....	30
<i>Monophyllus frater</i> $\times 2/1$; type; Morovis, Cueva Catedral, Porto Rico....	33
<i>Brachyphylla cavernarum</i> $\times 2/1$; adult φ ; Pueblo Viejo, Porto Rico.....	36
<i>Stenoderma rufus</i> . Skull figures $\times 3/1$; dentition $\times 14/3$; Morovis, Cueva Catedral, Porto Rico. A, crown view of maxillary tooth-row; B, crown view of mandibular tooth-row.....	40
<i>Artibeus jamaicensis jamaicensis</i> $\times 2/1$; adult δ ; Utuado, Porto Rico... ..	45
<i>Phyllonycteris major</i> $\times 2/1$; type; Morovis, Cueva Catedral, Porto Rico	49
<i>Erophylla bombifrons</i> $\times 3/1$; adult δ ; Pueblo Viejo, Porto Rico.....	53
<i>Eptesicus fuscus wetmorei</i> $\times 8/3$; adult φ ; Pueblo Viejo, Porto Rico....	56
<i>Tadarida murina</i> $\times 8/3$; adult φ ; Utuado, Porto Rico.....	60
<i>Molossus fortis</i> $\times 3/1$; adult δ ; Adjuntas, Porto Rico.....	65
<i>Nesophontes edithæ</i> . Skulls of adult male and adult female, from Cueva Catedral, Morovis, Porto Rico. $\times 2/1$	69
<i>Nesophontes edithæ</i> . Skulls of adult male and adult female, from Cueva Catedral, Porto Rico. $\times 2/1$	71
<i>Nesophontes edithæ</i> . Crown views of upper dentition, A, and lower dentition, B. $\times 6/1$	73
<i>Nesophontes edithæ</i> . Upper dentition in profile. $\times 6/1$	74
<i>Nesophontes edithæ</i> . Right scapula: A, external aspect; B, anterior aspect; C, ventral aspect. $\times 5/2$	76
<i>Nesophontes edithæ</i> . Left humerus: A, anterior aspect; B, internal aspect; C, posterior aspect. $\times 5/2$	77
<i>Nesophontes edithæ</i> . Right ulna: A, anterior aspect; B, external aspect; C, posterior aspect; D, internal aspect. $\times 5/2$	79
<i>Nesophontes edithæ</i> . Left radius: A, anterior aspect; B, external aspect; C, posterior aspect. $\times 5/2$	80
<i>Nesophontes edithæ</i> . Sacrum: A, dorsal aspect; B, lateral aspect. $\times 4/1$. ..	82
<i>Nesophontes edithæ</i> . Right innominate of adult male: A, external aspect; B, dorsal aspect; C, internal aspect. Left innominate of adult female: D, external aspect. $\times 5/2$	83
<i>Nesophontes edithæ</i> . Right femur of adult male: A, anterior aspect; B, posterior aspect; C, internal aspect; D, external aspect. Right femur of adult female: E, anterior aspect. $\times 2/1$	85
<i>Nesophontes edithæ</i> . Right tibia of adult male: A, external aspect. Left tibia and fibula of adult female: B, antero-external aspect; C, external aspect; D, posterior aspect. $\times 2/1$	87

	Page
<i>Elasmodontomys obliquus</i> . Skull, dorsal aspect. Morovis, Porto Rico.	
×1/1.	99
<i>Elasmodontomys obliquus</i> . Skull and mandible, lateral aspect. Morovis, Porto Rico.	
×1/1.	100
<i>Elasmodontomys obliquus</i> . Skull, lateral aspect. Utuado, Porto Rico.	
×1/1.	101
<i>Elasmodontomys obliquus</i> . Skull, front aspect. Morovis, Porto Rico.	
×1/1.	101
<i>Elasmodontomys obliquus</i> . Skull, ventral aspect. Morovis, Porto Rico.	
×1/1.	102
<i>Elasmodontomys obliquus</i> . Mandible, dorsal aspect. Morovis, Porto Rico.	
×1/1.	103
<i>Elasmodontomys obliquus</i> . Porto Rico. A, oblique aspect of superior incisor; B, oblique anterior aspect of inferior incisor; C, maxillary molar of unworn, maximum length; D, worn maxillary molar of aged animal, showing base of tooth filled in by cement; E, unworn mandibular molar; F, crown view of mandibular molars of aged animal	
×1/1.	107
<i>Amblyrhiza inundata</i> . Island of Anguilla. G, crown view of first two maxillary molars.	
×1/1.	107
<i>Elasmodontomys obliquus</i> . Porto Rico. A, external aspect of left scapula; B, internal aspect; C, posterior aspect; D, spine of scapula; E, glenoid surface of left scapula.	
×1/1.	110
<i>Elasmodontomys obliquus</i> . Porto Rico. A, anterior aspect of left humerus; B, internal aspect; C, posterior aspect; D, anterior aspect; E, anterior aspect of left clavicle; F, posterior aspect.	
×1/1.	112
<i>Elasmodontomys obliquus</i> . Porto Rico. A, anterior aspect of right ulna; B, external aspect; C, internal aspect; D, posterior aspect.	
×1/1.	114
<i>Elasmodontomys obliquus</i> . Porto Rico. A, anterior aspect of right radius; B, external aspect; C, posterior aspect.	
×1/1.	115
<i>Elasmodontomys obliquus</i> . Porto Rico. Sacrum. A, dorsal aspect; B, lateral aspect; C, ventral aspect.	
×1/1.	117
<i>Elasmodontomys obliquus</i> . Porto Rico. Innominate. A, dorsal aspect; B, lateral aspect; C, ventral aspect.	
×1/1.	119
<i>Elasmodontomys obliquus</i> . Porto Rico. A, anterior aspect of left femur; B, internal aspect; C, posterior aspect; D, external aspect.	
×1/1.	121
<i>Elasmodontomys obliquus</i> . Porto Rico. A, anterior aspect of left tibia; B, external aspect; C, internal aspect.	
×1/1.	123
<i>Elasmodontomys obliquus</i> . Porto Rico. A, external aspect of right fibula; B, posterior aspect; C, internal aspect.	
×1/1.	125
<i>Elasmodontomys obliquus</i> . Porto Rico. A, dorsal aspect of atlas; B, anterior aspect; C, lateral aspect of axis; D, anterior aspect.	
×1/1.	125
<i>Elasmodontomys obliquus</i> . Porto Rico. A, lateral aspect of thoracic vertebra; B, anterior aspect; C, lateral aspect of lumbar vertebra; D, dorsal aspect; E, lateral aspect of caudal vertebra; F, dorsal aspect.	
×1/1.	126
<i>Elasmodontomys obliquus</i> . Porto Rico. Astragalus, calcaneum, two views of ungual phalanx, and metatarsal.	
×1/1.	128

<i>Heptaxodon bidens</i> . Utuado, Porto Rico. A, B, two views of skull; C, D, two views of mandible. $\times 1/1$. E, crown view of maxillary molar; F, crown view of mandibular molar. $\times 8/3$	131
<i>Isolobodon portoricensis</i> . Utuado, Porto Rico. A, B, C, three views of skull. <i>Plagiodontia ædium</i> . San Lorenzo, Santa Domingo. D, view of skull. $\times 1/1$	135
A, <i>Plagiodontia ædium</i> . San Lorenzo, Santo Domingo. B, <i>Isolobodon portoricensis</i> . Utuado, Porto Rico. $\times 1/1$	136
<i>Isolobodon portoricensis</i> . Utuado, Porto Rico. A, B, C, three views of left mandible. <i>Plagiodontia ædium</i> . San Pedro de Macoris, Santo Domingo. D, E, F, three views of mandible. $\times 1/1$	137
<i>Isolobodon portoricensis</i> . Utuado, Porto Rico. Lateral view of molar tooth to show striations in cement. $\times 6/1$	138
<i>Heteropsomys insulans</i> . Utuado, Porto Rico. A, B, C, three views of skull; D, view of mandible. $\times 1/1$. <i>Homopsomys antillensis</i> . Ciales, Porto Rico. E, view of skull. $\times 1/1$	148
<i>Heteropsomys insulans</i> . Utuado, Porto Rico. Two views of atlas and two views of lumbar vertebra. $\times 1/1$	152
<i>Acratocnus odontrionus</i> . Skull, dorsal aspect. Utuado, Porto Rico. $\times 1/1$	156
<i>Acratocnus major</i> . Skull, dorsal aspect. Utuado, Porto Rico. $\times 1/1$.	157
<i>Acratocnus odontrionus</i> . Skull and mandibles, lateral aspect. Utuado, Porto Rico. $\times 1/1$	160
<i>Acratocnus major</i> . Skull and left mandible, lateral aspect. Utuado, Porto Rico. $\times 1/1$	161
<i>Acratocnus odontrionus</i> . Skull, lateral aspect. Morovis, Porto Rico. $\times 1/1$	163
<i>Acratocnus odontrionus</i> . Skull, ventral aspect. Utuado, Porto Rico. $\times 1/1$	164
<i>Acratocnus major</i> . Basicranial region of skull. Utuado, Porto Rico. $\times 1/1$	165
<i>Acratocnus odontrionus</i> . Mandible, dorsal aspect. Utuado, Porto Rico. $\times 1/1$	165
<i>Acratocnus major</i> . Mandible, dorsal aspect. Utuado, Porto Rico. $\times 1/1$.	166
<i>Acratocnus odontrionus</i> . Morovis, Porto Rico. Right malar. $\times 1/1$	166
<i>Acratocnus odontrionus</i> . Porto Rico. Upper and lower incisor. $\times 1/1$..	166
<i>Acratocnus odontrionus</i> . Morovis, Porto Rico. Left scapula. A, external aspect; B, glenoid surface. $\times 1/1$	168
<i>Acratocnus odontrionus</i> . Utuado, Porto Rico. A, anterior aspect of right humerus; B, external aspect. $\times 1/1$	170
<i>Acratocnus odontrionus</i> . Utuado, Porto Rico. Posterior aspect of right humerus. $\times 1/1$	171
<i>Acratocnus odontrionus</i> . Utuado, Porto Rico. Anterior aspect of clavicle. $\times 1/1$	173
<i>Acratocnus odontrionus</i> . Utuado, Porto Rico. Internal aspect of right ulna. $\times 1/1$	174
<i>Acratocnus major</i> . Utuado, Porto Rico. Anterior aspect of right ulna; B, internal aspect; C, posterior aspect. $\times 1/1$	175

	Page
<i>Acratocnus odontrigonus</i> . Morovis, Porto Rico. Anterior aspect of right radius. $\times 1/1$	176
<i>Acratocnus major</i> . Porto Rico. Ribs. $\times 1/1$	177
<i>Acratocnus odontrigonus</i> . Morovis, Porto Rico. External aspect of sternebra. $\times 1/1$	178
<i>Acratocnus major</i> . Utuado, Porto Rico. Lateral aspect of left innominate. $\times 1/1$	178
<i>Acratocnus major</i> . Utuado, Porto Rico. Portion of expanded ilium. $\times 1/1$	179
<i>Acratocnus odontrigonus</i> . Morovis, Porto Rico. A, anterior aspect of right femur; B, internal aspect. $\times 1/1$	180
<i>Acratocnus odontrigonus</i> . Morovis, Porto Rico. Posterior aspect of right femur. $\times 1/1$	181
<i>Acratocnus major</i> . Utuado, Porto Rico. A, anterior aspect of right tibia. $\times 1/1$. <i>Acratocnus odontrigonus</i> . Morovis, Porto Rico. B, anterior aspect of right tibia. $\times 1/1$	184
<i>Acratocnus odontrigonus</i> . Morovis, Porto Rico. A, external aspect of right tibia; B, posterior aspect. $\times 1/1$	185
<i>Acratocnus odontrigonus</i> . Utuado, Porto Rico. A, external aspect of left fibula; B, posterior aspect. $\times 1/1$	187
<i>Acratocnus major</i> . Utuado, Porto Rico. A, right calcaneum. <i>Acratocnus odontrigonus</i> . Utuado, Porto Rico. B, C, left calcaneum. $\times 1/1$	188
<i>Acratocnus odontrigonus</i> . Porto Rico. A, dorsal aspect of left astragalus; B, metatarsal; C, phalanx; D, ungual phalanx. $\times 1/1$	190
<i>Acratocnus</i> . Porto Rico. A, dorsal aspect of caudal vertebra; B, lateral aspect of same vertebra; C, lateral aspect of thoracic vertebra; D, lateral aspect of lumbar vertebra; E, dorsal aspect of same vertebra; F, cervical vertebra. $\times 1/1$	192
The extinct caracara (<i>Polyborus latebrosus</i>). Broken right metacarpal (type). Natural size. From cavern deposits near Utuado.....	325
The extinct caracara (<i>Polyborus latebrosus</i>). Right metacarpal (type). View of articular face. Natural size.....	325
The extinct De Booy's rail (<i>Nesotrochis debooyi</i>). Left tibio-tarsus. Internal view. Natural size. From cavern deposits of Cueva San Miguel	341
The extinct De Booy's rail (<i>Nesotrochis debooyi</i>). Left tibio-tarsus. Anterior view. Natural size. From cavern deposits of Cueva San Miguel	341
The extinct De Booy's rail (<i>Nesotrochis debooyi</i>). Left femur. Anterior view. Natural size. From cavern deposits of Cueva Clara.....	341
The extinct De Booy's rail (<i>Nesotrochis debooyi</i>). Left humerus. Anterior view. Natural size. From Cueva San Miguel.....	341
The extinct De Booy's rail (<i>Nesotrochis debooyi</i>). Left humerus. Posterior view. Natural size. From Cueva San Miguel.....	341
The extinct Porto Rican Snipe (<i>Capella anthonyi</i>). Right humerus (type). Posterior view. About natural size. From cavern deposits of Cueva Cathedral	361

	Page
The extinct Porto Rican Snipe (<i>Capella anthonyi</i>). Right humerus (type). Anterior view. About natural size. From cavern deposits of Cueva Catedral	361
The extinct Porto Rican Snipe (<i>Capella anthonyi</i>). Right metatarsus. Anterior view. Natural size. From cavern deposits of Cueva Cate- dral	361
The extinct Porto Rican Snipe (<i>Capella anthonyi</i>). Right metatarsus. Posterior view. Natural size. From cavern deposits of Cueva Cate- dral	361
The extinct Porto Rican Snipe (<i>Capella anthonyi</i>). Right metatarsus. Distal outline of trochleæ. Twice natural size. From Cueva Cate- dral	361
The extinct Porto Rican quail-dove (<i>Oreopeleia larva</i>). Left metatarsus (type). Anterior view. Slightly less than natural size. From cav- ern deposits of Cueva Clara.....	406
The extinct Porto Rican quail-dove (<i>Oreopeleia larva</i>). Left metatarsus (type). Proximal view of head. Slightly more than twice natural size	403
The extinct Porto Rican quail-dove (<i>Oreopeleia larva</i>). Left metatarsus (type). Distal outline of trochleæ. Twice natural size.....	406
The extinct Porto Rican barn owl (<i>Tyto cavatica</i>). Proximal end of left metatarsus (type). Anterior view. Natural size. From cavern deposits of Cueva Toraño.....	429
The extinct Porto Rican barn owl (<i>Tyto cavatica</i>). Proximal end of right metatarsus. Internal face. Natural size. From cavern de- posits of Cueva Toraño.....	429
The extinct lesser Porto Rican crow or solitario (<i>Corvus pumilis</i>). Right ulna (type). Inner face. Natural size. From cavern deposits of Cueva San Miguel.....	482

MAPS

Map of Porto Rico, with collecting sites indicated by black circles..	4
Map of the West Indian region to show Porto Rico in its geographical relation to other islands.....	239
Contour map of the Caribbean Sea. After Agassiz.....	240
Map showing distribution of the species of the genus <i>Artibeus</i> in the Antilles, Central America and northern South America. After An- derson	241
Map of Porto Rico and the Virgin Islands, with Dr. A. Wetmore's route of travel indicated.....	250

PLATES

(The plates are arranged consecutively at the end of the volume)

- I. Looking out from Corozal Cave.
Limestone hills along road from Utuado to Arecibo.
- II. Slopes of Luquillo Mountains.
- III. Vegetation in Luquillo Mountains.
- IV. Region about Morovis.
- V. Along road from Manatee to Morovis.
Near Ciales.
- VI. Near Guayama.
Palms near Morovis.
- VII. Along road from Naguabo to Guayama.
River near Coamo.
- VIII. Rio Grande de Arecibo.
- IX. High mountainous region near Cayey.
Cave interior of unproductive type.
- X. Piedra de la Cueva.
Entrance to Corozal Cave.
- XI. A large cave near Morovis, the Cave of San Miguel.
- XII. Interior of Corozal Cave.
Small cave near the Cave of San Miguel.
- XIII. *Nesophontes edithæ*.
Figs. 1a, 1b, 1c, 2a, 2b, 3a, 3b, 3c, 4. Skull.
Fig. 5. Mandible.
- XIV. *Nesophontes edithæ*.
Figs. 6a, 6b, 6c, 7. Scapula.
Figs. 8, 9, 10. Rib.
Figs. 11a, 11b. Left humerus.
Figs. 12a, 12b, 12c. Sacrum.
Figs. 13a, 13b, 13c. Right ulna.
Figs. 14a, 14b, 14c. Right radius.
Figs. 15a, 15b, 15c, 16a, 16b, 16c. Innominate.
- XV. *Nesophontes edithæ*.
Figs. 17a, 17b, 17c, 18a, 18b, 18c. Right femur.
Figs. 19a, 19b, 19c, 20a, 20b. Tibia.
Fig. 21. Atlas.
Fig. 22. Axis.
Fig. 23. Thoracic vertebra.
Fig. 24. Fifth cervical vertebra.
Fig. 25. Lumbar vertebra.
Fig. 26. Caudal vertebra.
- XVI. *Elasmodontomys obliquus*.
Figs. 1a, 1b. Skull.
Fig. 2. Left mandible.
- XVII. *Elasmodontomys obliquus*.
Figs. 3, 4a, 4b. Skull.
Fig. 5. Maxillary tooth-row.

- XVIII. *Elasmodontomys obliquus*.
 Figs. 1, 2. Mandible.
 Fig. 3. Mandibular tooth-row.
 Figs. 4, 5. Scapula.
- XIX. *Elasmodontomys obliquus*.
 Figs. 6a, 6b, 6c, 6d, 7. Left humerus.
- XX. *Elasmodontomys obliquus*.
 Figs. 8a, 8b, 8c, 8d. Right ulna.
 Figs. 9a, 9b. Right radius.
- XXI. *Elasmodontomys obliquus*.
 Figs. 1a, 1b, 1c, 1d. Left femur.
 Fig. 2. Left tibia.
- XXII. *Elasmodontomys obliquus*.
 Figs. 3a, 3b, 3c, 3d. Left tibia.
 Figs. 4a, 4b. Right fibula.
- XXIII. *Elasmodontomys obliquus*.
 Figs. 1a, 1b. Left innominate.
- XXIV. *Elasmodontomys obliquus*.
 Fig. 1c. Left innominate.
 Figs. 2a, 2b. Sacrum.
- XXV. *Elasmodontomys obliquus*.
 Fig. 3. Atlas.
 Figs. 4a, 4b. Axis.
 Figs. 5, 6, 7, 8. Thoracic vertebræ.
 Figs. 9a, 9b. Caudal vertebra.
 Fig. 10. Rib.
- XXVI. *Elasmodontomys obliquus*.
 Fig. 5. Rib.
 Figs. 6a, 6b. Series of five cervical vertebræ.
 Figs. 7a, 7b. Lumbar vertebræ.
- XXVII. *Isolobodon portoricensis*.
 Figs. 1a, 1b, 1c, 2. Skull.
- XXVIII. *Isolobodon portoricensis*.
 Figs. 3, 4. Skull.
 Figs. 5a, 5b, 5c, 6a, 6b. Mandible.
- XXIX. *Plagiodontia adæum*.
 Figs. 7a, 7b, 7d. Skull.
 Figs. 8a, 8b, 8c. Mandible.
- XXX. *Isolobodon portoricensis* and *Elasmodontomys obliquus*.
 Figs. 1a, 1b. Right scapula, *Isolobodon*.
 Figs. 2a, 2b. Acromion process, *Elasmodontomys*.
 Figs. 3a, 3b. Left clavicle. *Elasmodontomys*.
 Fig. 4. Ribs. *Isolobodon*.
 Figs. 5a, 5b, 5c. Right ulna, *Isolobodon*.
- XXXI. *Isolobodon portoricensis*.
 Figs. 6a, 6b, 6c. Left ulna.
 Figs. 7a, 7b, 7c. Right humerus.
 Figs. 8a, 8b, 8c. Left radius.
 Figs. 9a, 9b, 9c, 9d. Right femur.

- XXXII. *Isolobodon portoricensis*.
 Figs. 10a, 10b, 10c, 10d. Left femur.
 Figs. 11a, 11b. Left tibia.
 Figs. 12a, 12b, 12c. Left fibula.
- XXXIII. *Isolobodon portoricensis*.
 Figs. 13a, 13b, 13c. Sacrum.
 Figs. 14a, 14b, 14c. Right innominate.
- XXXIV. *Heteropsomys insulans*.
 Figs. 1a, 1b, 1c, 1d. Skull.
 Fig. 1e. Maxillary tooth-row.
- XXXV. *Heteropsomys insulans* and *Homopsomys antillensis*.
 Fig. 1f. Mandible, *Heteropsomys*.
 Fig. 1g. Mandibular molar series, *Heteropsomys*.
 Fig. 2. Palate, *Homopsomys*.
 Figs. 3a, 3b. Skull, *Homopsomys*.
 Figs. 4a, 4b. Mandible, *Homopsomys*.
- XXXVI. *Homopsomys antillensis*, *Heteropsomys insulans* and *Heptaxodon bidens*.
 Fig. 3c. Skull, *Homopsomys*.
 Fig. 5. Atlas, *Heteropsomys*.
 Fig. 6. Lumbar vertebra, *Heteropsomys*.
 Figs. 7a, 7b, 7c. Skull fragment, *Heptaxodon*.
 Fig. 7d. Premolar, *Heptaxodon*.
 Fig. 8. Left mandible, *Heptaxodon*.
 Fig. 9. Crown view of lower premolar, *Heptaxodon*.
- XXXVII. *Acratocnus odontrionus*.
 Skull, No. 17720, lateral aspect.
 Right jugal.
- XXXVIII. *Acratocnus odontrionus*.
 Mandible, two views.
- XXXIX. *Acratocnus odontrionus*.
 Skulls, No. 17720 and No. 17721, dorsal aspect.
- XL. *Acratocnus odontrionus*.
 Skulls, No. 17715 and No. 17722, dorsal aspect.
- XLI. *Acratocnus odontrionus*.
 Right scapula, two views.
- XLII. *Acratocnus odontrionus*.
 Skulls, No. 17715 and No. 17720, ventral aspect.
- XLIII. *Acratocnus odontrionus*.
 Skulls, No. 17715, lateral aspect.
- XLIV. *Acratocnus major*.
 Fig. 1. Mandible.
 Fig. 2a. Fragment of skull.
- XIV. *Acratocnus major*.
 Fig. 2b. Basicranial region.
 Fig. 2c. Orbital section.
- XLVI. *Acratocnus odontrionus* and *Acratocnus major*.
 Figs. 6a, 6b. Fragment of sacrum, *odontrionus*.
 Fig. 7a. Left innominate, *major*.

- XLVII. *Acratocnus odontrigonus* and *Acratocnus major*.
 Figs. 1a, 1b. Right tibia, *odontrigonus*.
 Fig. 2. Right tibia, *major*.
 Fig. 3. Left tibia, *odontrigonus*.
- XLVIII. *Acratocnus odontrigonus*.
 Figs. 4a, 4b. Left fibula.
 Figs. 5a, 5b. Left radius.
- XLIX. *Acratocnus odontrigonus* and *Acratocnus major*.
 Figs. 1a, 1b, 1c. Right humerus, *odontrigonus*.
 Fig. 2a. Right humerus, *major*.
- L. *Acratocnus odontrigonus* and *Acratocnus major*.
 Fig. 2b. Left humerus, *major*.
 Fig. 3. Right humerus, *odontrigonus*.
 Figs. 4a, 4b. Left ulna, *odontrigonus*.
 Fig. 5. Left ulna, *major*.
- LI. *Acratocnus odontrigonus*.
 Figs. 1, 2. Right femur.
 Figs. 3a, 3b. Left femur.
- LII. *Acratocnus odontrigonus* and *Acratocnus major*.
 Fig. 3c. Left femur, *odontrigonus*.
 Fig. 4. Distal extremity of left femur, *major*.
 Figs. 5a, 5b. Left calcaneum, *odontrigonus*.
 Fig. 6. Right calcaneum, *major*.
 Figs. 7a, 7b. Left astragulus, *odontrigonus*.
- LIII. *Acratocnus odontrigonus*.
 Caudal series of vertebrae.
- LIV. *Acratocnus*.
 Fig. 2. Pubic region, *odontrigonus*.
 Fig. 3. Ungual phalanges, *Acratocnus*.
 Figs. 4a, 4b. Ungual phalanx, *odontrigonus*.
- LV. View of arid scrub on Desecheo Island. Taken June 14, 1912.
 Grove of coconut palms and beach, a typical shore scene. Near
 Aguadilla, June 11, 1912.
- LVI. Clump of royal palms, nesting sites for Porto Rican and yellow-
 shouldered blackbirds. Near Yauco, May 17, 1912.
 Limestone formation typical of lower foothills of north coast.
 Near Trujillo Alto, December 26, 1911.
- LVII. View on El Yunque de Luquillo from an altitude of 800 feet.
 Taken March 6, 1912.
 El Yunque de Luquillo from the village of Mameyes. Taken
 February 16, 1912.
- LVIII. Rolling pastureland, breeding ground of the Porto Rican grass-
 hopper sparrow. Near Yabucoa, May 10, 1912.
 Second growth forest in lowlands, with setting of canefield and
 pasture. On grounds of experiment station at Río Piedras,
 December 20, 1911.
- LIX. Río Santiago near Yabucoa. Taken May 6, 1912.
 Llume palms, with background of cane and low hills. Vieques
 Island, March 20, 1912.

- LX. Open rolling pastureland typical of Culebra Island. Taken April 9, 1912.
Northwestern end of Culebrita Island, Cayo Norte in distance, taken April 15, 1912.
- LXI. West Indian green heron, or martinete (*Butorides virescens maculatus*).
- LXII. Bare-legged owl, or múcaro (*Gymnasio nudipes nudipes*).
- LXIII. Porto Rican tody, or San Pedrito (*Todus mexicanus*).
- LXIV. Gray kingbird, or pitirre (*Tyrannus dominicensis dominicensis*).
- LXV. Porto Rican blackbird, or mozambique (*Holoquiscalus niger brachypterus*).
- Porto Rican tanager, or verdoso (*Nesospingus speculiferus*).



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· Psittaciformes to Passeriformes—*Alexander Wetmore*



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THE BIRDS OF PORTO RICO AND THE VIRGIN ISLANDS

PSITTACIFORMES TO PASSERIFORMES

BY ALEXANDER WETMORE .

CONTENTS

	Page
Order Psittaciformes.....	412
Family Psittacidae.....	412
<i>Amazona vittata vittata</i> (Boddaert).....	412
<i>Amazona vittata gracilipes</i> Ridgway.....	414
<i>Aratinga chloroptera maugei</i> (Souancé).....	415
<i>Eupsittula pertinax pertinax</i> (Linnaeus).....	417
Order Cuculiformes.....	419
Family Cuculidae.....	419
<i>Coccyzus erythrophthalmus</i> (Wilson).....	419
<i>Coccyzus americanus americanus</i> (Linnaeus).....	420
<i>Coccyzus minor teres</i> Peters.....	421
<i>Saurothera vieilloti</i> Bonaparte.....	423
<i>Crotophaga ani</i> Linnaeus.....	425
Order Strigiformes.....	429
Family Tytonidae.....	429
<i>Tyto cavatica</i> Wetmore.....	429
Family Strigidae.....	430
<i>Gymnasio nudipes nudipes</i> (Daudin).....	430
<i>Gymnasio nudipes newtoni</i> (Lawrence).....	433
<i>Asio portoricensis</i> Ridgway.....	434
Order Caprimulgiformes.....	435
Family Caprimulgidae.....	435
<i>Antrostomus carolinensis</i> (Gmelin).....	435
<i>Antrostomus noctitherus</i> (Wetmore).....	436
<i>Chordeiles minor gundlachii</i> Lawrence.....	437
<i>Chordeiles minor vicinus</i> Riley.....	438
Order Micropodiformes.....	439
Family Micropodidae.....	439
<i>Nephoecetes niger niger</i> (Gmelin).....	439
Family Trochilidae.....	440
<i>Orthorhyncus exilis exilis</i> (Gmelin).....	440
<i>[Archilochus colubris]</i> (Linnaeus).....	443
<i>Chlorostilbon maugaeus</i> (Audebert and Vieillot).....	443
<i>Sericotes holosericeus holosericeus</i> (Linnaeus).....	445

	Page
<i>Anthracothorax viridis</i> (Audebert and Vieillot).....	447
<i>Anthracothorax aurulentus</i> (Audebert and Vieillot).....	449
Order Coraciiformes.....	452
Family Alcedinidae.....	452
<i>Streptoceryle alcyon alcyon</i> (Linnaeus).....	452
Family Todidae.....	453
<i>Todus mexicanus</i> Lesson.....	453
Order Piciformes.....	457
Family Picidae.....	457
<i>Melanerpes portoricensis</i> (Daudin).....	457
<i>Sphyrapicus varius varius</i> (Linnaeus).....	459
Order Passeriformes.....	460
Family Tyrannidae.....	460
<i>Tyrannus dominicensis dominicensis</i> (Gmelin).....	460
[<i>Tyrannus tyrannus</i> (Linnaeus)].....	464
<i>Tolmarchus taylori</i> (Sclater).....	464
<i>Myiarchus antillarum</i> (Bryant).....	467
<i>Blacicus blancoi</i> Cabanis.....	469
<i>Elaenia martinica riisii</i> Sclater.....	470
Family Hirundinidae.....	472
[<i>Iridoprocne bicolor</i> (Vieillot)].....	472
<i>Riparia riparia riparia</i> (Linnaeus).....	472
<i>Hirundo erythrogaster</i> Boddaert.....	473
<i>Petrochelidon fulva poeciloma</i> (Gosse).....	474
<i>Progne dominicensis</i> (Gmelin).....	477
Family Corvidae.....	479
<i>Corvus leucognaphalus</i> Daudin.....	479
<i>Corvus pumilus</i> Wetmore.....	482
Family Mimidae.....	483
<i>Mimus polyglottos orpheus</i> (Linnaeus).....	483
[<i>Mimus gilvus gilvus</i> (Vieillot)].....	485
<i>Margarops fuscatus fuscatus</i> (Vieillot).....	486
Family Turdidae.....	489
<i>Mimocichla ardosiacea portoricensis</i> (Bryant).....	489
[<i>Hylocichla mustelina</i> (Gmelin)].....	491
Family Vireonidae.....	492
<i>Vireo latimeri</i> Baird.....	492
<i>Vireo olivaceus olivaceus</i> (Linnaeus).....	494
[<i>Virco virescens</i> (Vieillot)].....	497
Family Coerebidae.....	498
<i>Coereba portoricensis portoricensis</i> (Bryant).....	498
<i>Coereba portoricensis sancti-thomae</i> (Sundevall).....	501
<i>Coereba newtoni</i> (Baird).....	502
Family Mniotiltidae.....	503

	Page
<i>Mniotilta varia</i> (Linnaeus).....	503
<i>Compsothlypis americana pusilla</i> (Wilson).....	504
<i>Dendroica tigrina</i> (Gmelin).....	506
<i>Dendroica petechia cruciana</i> Sundevall.....	507
<i>Dendroica magnolia</i> (Wilson).....	511
<i>Dendroica caerulescens caerulescens</i> (Gmelin).....	511
<i>Dendroica coronata coronata</i> (Linnaeus).....	513
<i>Dendroica virens virens</i> (Gmelin).....	514
<i>Dendroica dominica dominica</i> (Linnaeus).....	514
<i>Dendroica adelaidae</i> Baird.....	515
<i>Dendroica striata</i> (J. R. Forster).....	517
<i>Dendroica discolor</i> (Vieillot).....	518
<i>Dendroica palmarum palmarum</i> (Gmelin).....	520
<i>Seiurus noveboracensis noveboracensis</i> (Gmelin).....	520
<i>Seiurus noveboracensis notabilis</i> Ridgway.....	522
<i>Seiurus motacilla</i> (Vieillot).....	522
<i>Seiurus aurocapillus aurocapillus</i> (Linnaeus).....	523
<i>Oporornis philadelphia</i> (Wilson).....	525
<i>Geothlypis trichas brachidactyla</i> (Swainson).....	525
<i>Setophaga ruticilla</i> (Linnaeus).....	526
Family Ploceidae.....	528
<i>Spermestes cucullatus cucullatus</i> Swainson.....	528
<i>Estrilda melpoda melpoda</i> (Vieillot).....	530
Family Icteridae.....	532
<i>Dolichonyx oryzivorus</i> (Linnaeus).....	532
<i>Agelaius xanthomus</i> (Sclater).....	532
<i>Icterus portoricensis</i> Bryant.....	535
<i>Icterus icterus ridgwayi</i> (Hartert).....	538
<i>Holoquiscalus niger brachypterus</i> (Cassin).....	539
<i>Molothrus atronitens</i> Cabanis.....	543
Family Thraupidae.....	543
[<i>Piranga erythromelas</i> Vieillot].....	543
<i>Nesospingus speculiferus</i> (Lawrence).....	544
<i>Spindalis portoricensis</i> (Bryant).....	546
<i>Tanagra sclateri</i> (Sundevall).....	549
Family Fringillidae.....	552
<i>Tiaris bicolor omissa</i> Jardine.....	552
<i>Tiaris olivacea bryanti</i> (Ridgway).....	555
<i>Loxigilla portoricensis</i> (Audin).....	557
[<i>Spinus cucullatus</i> (Swainson)].....	559
<i>Ammodramus savannarum borinquensis</i> Peters.....	560
[<i>Melospiza lincolni</i> (Audubon)].....	562
Bibliography.....	562
Index.....	573

Order PSITTACIFORMES

Family PSITTACIDAE

Subfamily PIONINAE

Amazona vittata vittata (Boddaert)

Porto Rican Parrot, Cotorra

- Psittacus vittatus* Boddaert, Tabl. Plan. Enl., 1783, p. 49, (Porto Rico.)
Psittacus dominicensis, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 199, 256 (Porto Rico).
Psittacus festivus?, Moritz, Wiegman. Arch. für Naturg., 1836, p. 389, (Porto Rico).
Chrysotis, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 256, (Porto Rico, specimens).
Psittacus vittatus, Sundevall, Öfvers, Kongl. Vetensk.-Akad. Förh., 1869, p. 599 (Porto Rico, specimens).
Chrysotis vittata, Taylor, Ibis, 1864, p. 171 (Porto Rico).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 183-184; Anales Soc. Esp. Hist. Nat., 1878, p. 228 (Utuado, Quebradillas; specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 62, 147 (Porto Rico, specimens).—Cory, Auk, 1886, p. 458 (Porto Rico).
Amazona vittata, Cory, Cat. West Indian Birds, 1892, pp. 101, 132 (Porto Rico).—Bowditch, Auk, 1902, p. 363 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 55-56 (northeast Porto Rico, specimens).
Amazona vittata vittata, Ridgway, U. S. Nat. Mus. Bull. 50, 1916, Pt. 7, p. 264 (Porto Rico).

Porto Rico, formerly abundant and widespread (recorded from Isabela, Quebradillas and Utuado definitely), now restricted to mangrove swamps near Mameyes, the eastern slopes of El Yunque de Luquillo and the forested region between Arecibo and Utuado.

Moritz, in 1836, reported great flocks of parrots, and Taylor, in 1864, noted them as common. Gundlach found them at Quebradillas and Utuado, and said that they occurred mainly in the interior, where they often damaged corn in the milky stage. Stahl reports one skin in his collection, with a tendency to xanthochroism, that came from Isabela. Two skins collected by Stahl are preserved in the Museum of Comparative Zoölogy.

It appears that until thirty years ago the parrot was a common species in Porto Rico, but now has disappeared except in a few localities, mainly in the northeastern portion of the island, on the mountain known as El Yunque de Luquillo and immediately around its base. From February 9 to 29, 1912, I found about twenty ranging through the dense swampy

forests north of Mameyes (one taken), while perhaps fifty were seen between March 2 and 11 around the west fork of the Río Mameyes, or were heard calling in the dense forests covering the summit of El Yunque itself. (Eight, all adult, were taken here.) Parrots were said to be still fairly common around Preston's Ranch, above Naguabo. On the western end of the island they had practically disappeared, though birds were reported from below San Sebastian, and Mr. Leopold B. Strube, of the Hacienda "Jobo," between Arecibo and Utuado, said that during the winter months fifty or sixty were found on his plantation, though none nested there. At Lares I was told that no parrots had been seen for ten years.

Near Mameyes they remained in the swamps during the day, coming out to the borders morning and evening to feed, but, when alarmed, flew back inland immediately. Sometimes a small flock was found feeding in company with white-crowned pigeons in the tops of trees, when, due to their green coloration, the parrots were the less conspicuous of the two. Frequently the parrots hid in the trees and remained quiet for half an hour or more, and then flew out in sudden alarm.

Around El Yunque the birds were somewhat tamer, as they were not hunted so much, and a few were secured about a large clearing above the Río Mameyes. The birds were in pairs or small bands during March and were then breeding. During the early morning and evening they fed in the forest and in passing often stopped in high, dead trees that were standing in the clearing. After heavy rains that came at intervals during the day, they alighted there also, to dry their feathers in the sun. The call-note, given on the wing, was a rapid, strident *kar, kar*, that could easily be heard at the distance of a mile, and served to alarm the entire forest. When they were feeding, low chuckling notes were heard frequently. In the trees the birds went through the characteristic posturings of *Amazona* in captivity, swinging head down and then climbing to an upright position by the aid of their bills, or watched suspiciously to see what I was about. When it rained heavily on the mountain, many birds descended to the warmer valleys, returning when the weather cleared.

These birds nest during March and April and it is said lay two eggs, depositing them in a hollow tree. The parrots are greatly sought by the natives, who keep the young as pets and teach them to speak a few words of Spanish, though most of the captive birds on the island are another species, brought from the island of Haiti. The adults are also hunted as game birds and are prized for their flesh. Formerly parrots

traveled in large bands that damaged cornfields, gonduros and other crops, and men engaged in school work told me that, as late as 1903, children were frequently kept from school by their parents to drive parrots out of the fields. The handful remaining is, however, too small to do any great damage, and the birds should be protected or they will soon be extinct and one of the most interesting forms will be lost from the avifauna of the island.

From personal observations and what I was told, it seems that the parrot is almost entirely frugivorous, practically all wild fruits being eaten in season. These birds are fond of the fruits of the wild fig (*Ficus*) and the jagua (*Genipa americana*), while in swamps near Mameyes the ground beneath the icaco trees (*Chrysobalanus*) was strewn with husks which they had dropped. In eight stomachs examined I found vegetable matter alone, with the seeds of tabonuco (*Dacryodes excelsa*) and allied species in the same family (Burseraceae) predominating. A parrot taken near Mameyes had eaten icacos (*Chrysobalanus*). In the birds obtained on El Yunque it was common to find the stomach filled predominantly with small seeds, while the crop was distended with larger fruits and drupes. The hard seeds in the gizzard seemed in this case to take the place of the gravel used by many birds as a triturating element. While they served to grind up larger fragments, they were in their turn pulverized and utilized as food. In localities where the parrots were feeding commonly, the ground was always littered with seeds, bits of pericarp and other waste matter which they had discarded.

The plumage of this bird is clear green, with the outer webs of the primaries blue, the forehead and lores red, and the bill and feet flesh-color.

***Amazona vittata gracilipes* Ridgway**

Culebra Island Parrot, Cotorra

Amazona vittata gracilipes Ridgway, Proc. Biol. Soc. Washington, May 27, 1915, Vol. XXVIII, p. 106. (Culebra Island.) U. S. Nat. Mus. Bull. 50, 1916, Pt. 7, p. 265 (Culebra).—Wetmore, Auk, 1917, p. 59 (Culebra, extinct).

Papagencn, West, Beytr. Besch. St. Croix, 1794, p. 268 (Vieques).

Parrot?, Knox, Hist. Acc. St. Thomas, W. I., 1852, p. 221 (Havensigt, St. Thomas).

Amazona vittata?, Wetmore, Auk, 1916, p. 413 (Vieques, reported).

Culebra Island; now apparently extinct.

The only specimens known of the Culebra Island parrot are three in the U. S. National Museum, two males and a female (including the type).

of the subspecies), secured by A. B. Baker on February 11 and 12, 1899. In his manuscript notes Mr. Baker has stated that the bird at that time appeared to be common and was said to injure plantations and bananas. I did not find it during my collecting on the island in 1912 and it is thought to be extinct.

The Culebra Island subspecies is smaller than the form of the main island. In the three specimens available the wing measures 170 and 175 in the males and 175 mm. in the female. In six males from Porto Rico the wing ranges from 184 to 196 mm.; and in six females, from 173 to 184.5 mm.

On Vieques Island, in 1912, I was told that parrots were seen formerly in the heavy forests of the southern part of the island. It was thought that they came from Porto Rico, as they were found in the rainy season. Señor José Barton, a local hunter, was well acquainted with them and told me that they were considered a valuable game bird. I saw none during my work there. It may be mentioned that Hans West (Beyträge Beschr. von St. Croix, 1794, p. 268) remarks on the screaming of green parrots from the trees during his visit to Vieques.

Knox, writing of St. Thomas, reports parrots as quite abundant in the hills at Havensigt, on the eastern side of the harbor, in the same locality as that favored by the paroquet. There is nothing further known of true parrots on that island.

Subfamily ARINAE

Aratinga chloroptera maugei (Souancé)

Porto Rican Paroquet, Periquito

Psittacara maugei Souancé, Rev. et Mag. Zool., Ser. 2, 1856, p. 59. (Porto Rico.)

Papagey, Moritz, Wiegmann, Arch. Naturg., 1836, p. 389 (Porto Rico).

Psittacus rufirostris, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, Vol. II, 1810, pp. 200, 256-257. (listed).

Conurus evops?, Gundlach, Journ. für Ornith., 1878, pp. 160, 184 (Mona, fragmentary specimens); Anales Soc. Esp. Hist. Nat., 1878, p. 229 (Mona, Porto Rico; reported).—Stahl, Ornith., 1887, p. 448 (Porto Rico; listed).

Conurus chloropterus, Cory, Auk, 1892, pp. 228-229 (Mona; specimen); Cat. West Indian Birds, 1892, pp. 101, 141 (Mona).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 55 (Porto Rico, Mona; comments).—Schmidt, Field Mus. Nat. Hist., Zool. Ser., 1926, Vol. XII, p. 151 (Mona).

Conurus gundlachi Cabanis, Orn. Centr., 1881, Vol. VI, p. 5. (Described as new from Mona).—Stahl, Faun. Puerto Rico, 1883, p. 62 (Porto Rico, extinct);

Mona).—Cory, Auk, 1886, p. 457 (Mona).—Astley, Avic. Mag., 1913, Vol. V, p. 88 (captive specimens from Mona).

Conurus maugei?, Bowdish, Auk, 1903, p. 20 (Porto Rico; reported).

Aratinga chloroptera maugei, Ridgway, U. S. Nat. Mus. Bull. 50, 1916, Pt. 7, p. 155. (Mona.)

Formerly said to have occurred on Porto Rico, but now extinct; Mona Island.

A paroquet was formerly found on the island of Porto Rico, but disappeared before the days of modern collectors. According to the Catalogue of Birds in the British Museum (1891, Vol. XX, p. 189), the type of the present form is preserved in the Paris Museum, while there is a second specimen in Leyden. The locality for these two is not definitely stated; but, since Salvadori gives the range as "Porto Rico (?) and Mona Island, between Porto Rico and St. Domingo," it may be inferred that they are from Mona. Ledru speaks of paroquets found in large bands, but his records are uncertain. Moritz, in 1836, notes a very small parrot said to live on the northern side of Porto Rico, but did not see it personally. Gundlach heard of it in the seventies in the eastern interior, but Stahl says that in his time the oldest inhabitants knew of it only through their parents. It was reported to Bowdish from mountains near Lares, but this information was certainly erroneous, judging from my own experience. In 1912 I was told by a number of persons that paroquets were still in existence, but always at a distant point that ever receded before me; so that I never entered what were, according to popular accounts, their haunts.

I saw numerous paroquets in captivity in Porto Rico, but all were birds imported from either Venezuela or Haiti.

From Mona Island Gundlach received through Dr. Block three wings that were described by Cabanis as *Conurus gundlachi*. Stahl noted the bird from Mona, and Cory received from W. W. Brown, Jr., a skin from Mona taken February 25, 1892. A recent record of living specimens in 1913 in the aviaries of Walter Rothschild and H. D. Astley, in England, is said on investigation to refer to another species. (See Av. Mag., 1913, vol. V, p. 153).

The single specimen in the Field Museum (which I have examined) has been the basis for recognition by Mr. Ridgway of a race distinct from the form of Haiti. This one bird differs from a fair series of *Aratinga chloroptera chloroptera* (Souancé) in slightly smaller and more darkly colored bill, lighter red of the under primary coverts, and in having the lesser coverts of the outside of the wing entirely green. According to my

personal records, the wing measures 157.5, tail 159.5 and culmen 26.6 mm. The wing is slightly shorter than in birds from Haiti.

Paroquets were reported to Gundlach from Vieques Island, and I was told that they appeared there sometimes in the rainy season from June to August, but this I considered extremely doubtful.

***Eupsittula pertinax pertinax* (Linnaeus)**

Curaçao Paroquet

Psittacus pertinax Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 98. (America.¹⁵)

Psittacus tui, Ledru, Voy. Ténériffe, La Trinite, Saint Thomas, Sainte-Croix et Porto Ricco, 1810, Vol. II, p. 39 (from "les îles danoises.")—Knox, Hist. Acc. St. Thomas, W. I., 1852, p. 221 (St. Thomas).

Conurus, Eggers, Tidsskr. pop. Fremst. Naturvid., 1878, p. 203 (Flag Hill, St. Thomas).

Conurus xantholaemus Newton, Psittaci novae Speciei ad Conurum Genus pertinentis Descriptio, Aug. 30, 1859, one page (privately printed). (Described as new from St. Thomas.)—Sclater, Ann. Mag. Nat. Hist., Sept. 1859, p. 225. (Described as new from St. Thomas.)—Newton, Ibis, 1859, p. 374 (St. Thomas).—Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 377 (St. Thomas, specimens).—Nicoll, Ibis, 1904, p. 576 (St. Thomas).

Conurus pertinax, Cory, Cat. West Indian Birds, 1892, p. 101 (St. Thomas).—Hartert, Nov. Zool., 1902, Vol. IX, p. 275 (St. Thomas).—Mortensen, Atlanten, 1909, Vol. VI, No. 66, p. 646, Fig. 307 (St. Thomas; eastern end).

Eupsittula pertinax pertinax, Ridgway, U. S. Nat. Mus. Bull. 50, 1916, Pt. 7, p. 165 (St. Thomas).

Island of St. Thomas; formerly common, but now said to be rare.

Mr. Ridgway finds that the paroquet of St. Thomas is identical with the typical subspecies of *Eupsittula pertinax*, native to the island of Curaçao, and suggests that the bird has been carried from that point to St. Thomas. Though that may well be true, the paroquet has long been established near Charlotte Amalie, as the following will show.

Ledru reports paroquets from the Danish Islands, while Knox, in 1852, is more specific, stating that these birds are quite abundant near Havensigt on St. Thomas. The Newtons, in 1858, found them restricted to this locality, which, they inform us, refers to the hills on the eastern side of the harbor. Swift sent specimens to John Cassin (recorded in 1860). Baron Eggers, in 1878, reports the bird from Flag Hill. M. J. Nicoll, writing at St. Thomas, February 21 to 24, 1904, regarding the paroquet, says: "Some told me that it was extinct, but one

¹⁵ Though the type locality in the original description is given as "Indlis," in the twelfth edition of his work (1766, p. 142) Linnaeus corrected this to America.

man, a doctor, informed me that he had occasionally seen a few at the eastern end of the island. . . . During our short visit I did not meet with it. . . . Dr. Lowe, of the S. Y. 'Emerald,' shot one from a small flock at the east end of the island a few weeks before our visit. I have had the pleasure of examining this specimen in Dr. Lowe's collection." Mortensen, writing in 1909, says that he saw the paroquet in a valley at the eastern end of the island. This is the most recent published reference to the bird, but Dr. Robert Cushman Murphy informs me that R. H. Beck secured specimens in eastern St. Thomas on August 14, 1916.

In the U. S. National Museum there are two skins from St. Thomas secured from A. H. Riise, one taken January 19, 1860, and the other without data. A third (No. 26947) is the only remaining skin of a series of eight secured from John Akhurst, formerly a dealer and taxidermist in Brooklyn, N. Y., without other data than the locality, except that they were catalogued March 2, 1863. A fourth specimen, a male, was collected by F. A. Ober.

I was told that a paroquet was found at times on Vieques during the period of summer rains, but considered this doubtful.

The fact that Alfred Newton described this bird as *Conurus xantholaemus*, in a paper privately printed under the title *Psittaci novae Speciei ad Conurum Genus pertinentis Descriptio*, has been generally overlooked. The date of this publication is August 30, 1859; so that it appeared at about the same time and apparently prior to P. L. Selater's description, also as *Conurus xantholaemus*, in the *Annals and Magazine of Natural History* for September of the same year. Newton's paper, of which I have a copy, is cited in his bibliography, but reference to his description has not met my eye in any synonymy that I have examined. As the tract is so rare that it is accessible to very few, it is here transcribed in its original form:

PSITTACI
NOVAE SPECIEI
AD CONURUM GENUS
PERTINENTIS
DESCRIPTIO.

AUCTORE A. NEWTON, A. M.,
COLL. S. B. MAR. MAGD. AP. CANT. SOC.,
S. L. S., &c.

SITOMAGI ICENORUM:
MDCCCLIX.

CONURUS XANTHOLAEMUS. (Sp. nondescr.)

Synon:—*Psittacus tui*, LEDRU, *Voyage aux Iles de Teneriffe, &c.* tom. ii, p. 39.

Descr:—*Maris*. Supra laete viridis, fronte flava, caudae rectricibus et alarum remigibus caeruleo indutis: subtus, gula et genis ochraceo-flavis, collo ejusdem coloris sed dilutius sordidiusque, pectore, lateribus, abdomine et cauda subtus laete flavescenti-virentibus: rostro et pedibus fuscis.

Long. tota ix poll., alae v, caudae iv

—*Foeminae*. Mari similis sed dilutior.

Hab:—Ins. Sci. Thomae, Antillorum.

Mus.—Britan., P. L. Sclateri et Auctoris.

Obs:—*Conuro aeruginoso* G. R. Graii, e Brasilia, aliquanto similis, sed sine gula brunnea; a Ledruo (*loco citato*) pro *Ps. tui* Gmelini, ex Amer. Merid., errore captus.

DIE xxx Augusti, MDCCCLIX.

FINIS.

Excudebat A. Farr, Sitomagi Icenorum.

The Curaçao paroquet has the plumage in general green, with the forehead, sides of head and neck and a patch on the abdomen orange, and a blue band across the crown between the orange and green that have been mentioned.

Order CUCULIFORMES

Suborder CUCULI

Family CUCULIDAE

Subfamily CUCULINAE

[*Coccyzus erythrophthalmus* (Wilson)]

Black-billed Cuckoo, Pájaro Bobo

Cuculus erythrophthalma Wilson, Amer. Orn., 1811, Vol. IV, p. 16, Pl. 28, Fig. 2.
(Probably near Philadelphia, Pa.)

Coccyzus erythrophthalmus, Gundlach, Journ. für Ornith., 1878, pp. 160, 185;
Anales Soc. Esp. Hist. Nat., 1878, p. 232 (pictured in album of Bello).—
Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 56 (of doubtful occurrence).—Ridgway, U. S. Nat. Mus. Bull. 50, 1916, Pt. 7, p. 39 (Porto Rico).

The black-billed cuckoo is of doubtful occurrence in Porto Rico. Gundlach informs us that he saw a drawing of the bird in the album of Dr. Bello, who had received a specimen from the interior of the island. There is no other report of it; and the only other West Indian record seems to be of a specimen taken by Gundlach many years ago near Cardenas, Cuba.]

***Coccyzus americanus americanus* (Linnaeus)**

Yellow-billed Cuckoo, Pájaro Bobo, Pájaro Bobo de Costa

Cuculus americanus Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 111. (Carolina.)

Coccyzus americanus, Newton, Ibis, 1859, pp. 149-150 (St. Croix; nesting).—Bello, Zool. Gart., 1871, p. 350 (Porto Rico, listed).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 185; Anales Soc. Esp. Hist. Nat., 1878, p. 232 (Mayagüez, Aguadilla, Arecibo, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 62, 148 (Porto Rico; specimens).—Cory, Auk, 1886, p. 364 (Porto Rico, St. Croix); Cat. West Indian Birds, 1892, p. 102 (Porto Rico, St. Croix).—Bowdish, Auk, 1902, p. 364 (Aguadilla, Mona; specimens).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 56-57 (Joyuda, specimen).—Schmidt, Field Mus. Nat. Hist., Zoöl. Ser., 1926, Vol. XII, p. 151 (Mona).

Coccyzus americanus americanus, Ridgway, U. S. Nat. Mus. Bull. 50, 1916, Pt. 7, p. 14 (Porto Rico, St. Croix).

Mona, Porto Rico, St. Croix; fairly common.

Bowdish shot an adult on Mona Island, August 17, 1901—the only record of the bird for that island (specimen in U. S. National Museum).

On Porto Rico the species is of regular though uncommon occurrence, and thus far has been recorded only on the coastal plain. Gundlach secured one at Mayagüez, one at Aguadilla, and two at Arecibo, but does not give the dates at which these were taken. Stahl secured two specimens, and Bowdish shot two at Aguadilla—a female, May 18, and a male, May 20, 1900. On August 27, 1912, I heard one calling in an almendra grove at Joyuda near Cabo Rojo, and on collecting it found it to be an immature female in molt into first fall plumage. Another that I supposed to be the same species was heard in this locality on August 31. F. A. Potts records it, June 20, 1921, near Guayama and, July 6, 1923, north of Ponce. It would appear that the species breeds here, but this is not yet certain.

On St. Croix the Newtons reported the yellow-billed cuckoo as confined to the south side of the island. A female containing a nearly formed egg was taken on June 2, 1858, and June 29 of the same year a nest containing three eggs was found. The species is reported also to have bred in Cuba and is said to nest commonly in Jamaica.

The yellow-billed cuckoo is distinguished easily from the mangrove cuckoo by its white breast. The yellow base of the lower mandible is characteristic.

Coccyzus minor teres Peters

Mangrove Cuckoo, Pájaro Bobo, Pájaro Bobo Menor

- Coccyzus minor teres* Peters, Proc. New England Zool. Club, Vol. IX, June 24, 1927, p. 112. (Sosúa, Dominican Republic.)
- Mangrove Cuckoo, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).
- Cuculus minor*, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 201, 260-261 (listed).
- Cuculus dominicus*, Ledru, cit. supra, pp. 201, 260 (listed).
- Coccyzus seniculus*, Newton, Ibis, 1859, p. 150 (St. Croix; specimen).—Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 377 (St. Thomas; specimens).
- Coccyzus seniculus*, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 599 (Porto Rico).
- Coccyzus nesiotus*, Taylor, Ibis, 1864, p. 170 (Porto Rico).
- Coccyzus minor*, Hartlaub, Isis, 1847, p. 611 (listed).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 255 (Porto Rico).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 185; Anales Soc. Esp. Hist. Nat., 1878, p. 231 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 62, 148 (Porto Rico).—Ridgway, Proc. U. S. Nat. Mus., 1884, Vol. VII, p. 172 (St. Thomas; specimens).—Cory, Auk, 1890, p. 375 (Tortola, Virgin Gorda; specimens); Cat. West Indian Birds, 1892, p. 102 (Mona, Porto Rico, St. Croix, Tortola, Virgin Gorda).—Nicoll, Ibis, 1904, p. 576 (St. Thomas; specimens).
- Coccyzus minor dominicae*, Cory, Cat. West Indian Birds, 1892, p. 102 (Porto Rico).
- Coccyzus minor maynardi*, Cory, cit. supra, p. 102 (Porto Rico).
- Coccyzus minor dominicata*, Bowditch, Oölogist, 1900, p. 72 (Vieques).
- Coccyzus minor dominicensis*, Bowditch, Auk, 1902, p. 364 (Mona, Porto Rico, specimens).
- Coccyzus minor nesiotus*, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 57-58 (Porto Rico, Vieques); Auk, 1916, p. 413 (Vieques; specimens); Auk, 1917, p. 59 (Culebra, Culebrita, Louis Peña; specimens).—Ridgway, U. S. Nat. Mus. Bull. 50, 1916, Pt. 7, p. 27 (Porto Rico: Caguas, Porto Real, Luquillo, Mameyes, Utuado, Guayama, Lares, Aibonito, Cayey; Vieques, Mona, Culebra, Culebrita, St. Thomas, St. John, Virgin Gorda, Tortola, St. Croix).—Struthers, Auk, 1923, p. 474 (Porto Rico; coastal plain).—Schmidt, Field Mus. Nat. Hist., Zool. Ser., 1926, Vol. XII, p. 151 (Mona).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 91 (Cartagena Lagoon).

Mona, Porto Rico, Vieques, Culebra, Culebrita, Louis Peña, St. Thomas, St. Croix, St. John, Tortola, Virgin Gorda; apparently resident; in many localities common.

On Mona Island Bowditch found this cuckoo common from August 9 to 21, 1901, and collected six specimens, which are in the U. S. National Museum. These appear very slightly paler below than the average from

other localities, and may with further study represent a local race, though scattered individuals from other regions equal them in this character.

On Porto Rico this form of cuckoo is widely distributed wherever there are thickets or forests, from the mangroves of the coasts to the tops of the highest mountains, and from the rain-drenched forests of El Yunque to the dry hills of the southeast coast. In 1912 I recorded it at Bayamón, July 20 to 25; Mameyes (coastal region), February 9 to 29 (specimen, February 14); Maunabo, May 11; Salinas, April 26 to May 2; between Juana Diaz and Coamo, August 22; Lares, June 27 (specimen); Caguas, January 5 to 14 (one taken January 8); Cayey, January 22 (two taken); Aibonito, January 26 to February 5 (one taken, January 27); below the summit of El Yunque, March 8. In the U. S. National Museum there are skins collected at Porto Real, January 27, 1899, by J. D. Milligan, and at Luquillo, March 5, 1900, by C. W. Richmond.

This cuckoo is found in mangrove swamps, coffee plantations, dense thickets overgrown with vines along streams, or in heavier forests, but is easily overlooked, as it is retiring in habit. Its loud, sonorous calls, similar to those of the yellow-billed cuckoo, are heard more often than the bird itself is seen. It is slow and methodical in movement, seldom flying far in passing from covert to covert, and often remaining motionless for several minutes on one perch. In early morning it frequently rests on dead limbs in the sun, silent or occasionally calling.

Bowdish notes that a female shot near Mayagüez in September, 1901, would have deposited an egg the following day. There is no other data available regarding the breeding of these birds, but it would appear to be irregular.

From Vieques Island Bowdish reported several in 1900, and C. W. Richmond secured a female on March 22. From March 16 to April 3, 1912, I found the birds common on the southern side of the island, where they inhabited a jungle so dense that it was difficult to see them. Their notes came frequently from dense, dry, thorny thickets in the intense heat of the middle of the day, but the birds, working slowly through this cover, usually near the ground, remained securely hidden. Three specimens taken March 25 were about to breed.

On Culebra Island they were fairly common from April 5 to 21, 1912, and I secured adult females with ovaries enlarged on April 13, 17 and 19. The birds were calling on Louis Peña on April 11, and on April 15 I heard a number on Culebrita and secured a female.

The Newtons report a female shot on St. Croix, March 23, 1858, as the only one seen. Specimens from St. Thomas were sent by Robert Swift

to Cassin (two skins from this source are in the U. S. National Museum), and Benedict and Nye, of the *Albatross*, secured three here from January 17 to 24, 1884. M. J. Nicoll collected skins of this bird on St. Thomas between February 21 and 24, 1904. There is a specimen in the U. S. National Museum taken on St. John by F. A. Ober, and Cory reports skins from Tortola and Virgin Gorda secured by Winch.

Coccyzus m. teres described recently by Peters is distinguished from *nesiotes* of Jamaica when examined in series by grayer, less rufescent upper breast. Other differences alleged do not appear clear. The two forms are so closely allied that they must be examined in series as individuals are distinguished with difficulty or not at all. The Porto Rican bird is similar to that of Hispaniola.

The mangrove cuckoo is grayish brown above, and deep buff below, with a black line through the eye and a black tail tipped widely with white. Like the yellow-billed cuckoo, it has the base of the mandible yellow. The bird lives mainly on various forms of Orthoptera, on caterpillars, and on beetles. As is often the case in birds of this genus, a number of the stomachs that I examined were lined with hairs from caterpillars that had been eaten, stuck firmly in the stomach lining. The species is rated as a thoroughly useful bird.

Saurothera vieilloti Bonaparte

Porto Rican Lizard-Cuckoo, Pájaro Bobo, Pájaro Bobo Major, Pájaro de Agua

Saurothera vieilloti Bonaparte, Consp. Av., 1850, Vol. I, p. 97 ("Antilles"—Porto Rico.)

Cuculus vetula, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 201, 259-260 (listed).—Moritz, Wiegmann, Arch. für Naturg., 1836, p. 387 (Porto Rico).

Saurothera, Bello, Zool. Gart., 1871, p. 350 (Porto Rico).

Saurothera vieilloti var. *rufescens*, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 256 (Porto Rico).

Saurothera vieilloti, Newton, Ibis, 1859, p. 378 (Vieques; specimen).—Taylor, Ibis, 1864, p. 170 (Porto Rico; abundant).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 599 (Porto Rico; specimens).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., pp. 160, 184-185; Anales Soc. Esp. Hist. Nat., 1878, p. 230 (Porto Rico; specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 148 (Porto Rico; specimens).—Cory, Auk, 1886, p. 363 (Porto Rico); Cat. West Indian Birds, 1892, pp. 102, 132 (Porto Rico).—Shelley, Cat. Birds. Brit. Mus., 1891, Vol. XIX, p. 372 (Porto Rico, Vieques, St. Thomas; specimens).—Bowditch, Auk, 1902, p. 364 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 58-59 (Porto Rico, Vieques); Auk, 1916, p. 413 (Vieques; listed); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 319 (bones from caves, Utuado and

Morovís).—Ridgway, U. S. Nat. Mus. Bull. 50, 1916, Pt. 7, p. 62 (Porto Rico, Vieques, St. Thomas).—Struthers, Auk, 1923, p. 474 (Consomo, Maricao, Mayagüez).

Porto Rico; fairly common resident: Vieques, St. Thomas; casual (formerly resident?).

Early visitors to Porto Rico recorded the lizard-cuckoo as abundant, but in the last fifty years it has decreased until now only in the heavy forests near Maricao may it be said to be common. In 1912 I found it at Quebradillas, July 2 to 6 (adult male taken July 5); Manatí, July 7 to 11; Río Piedras, December 18, 1911, and January 4, 1912; Mameyes, February 12 (adult male taken); Añasco, June 8; Maricao, May 29 to June 5 (three taken May 30 and June 4); Lares, June 18 to July 1 (three taken June 21, 22 and 28); Ciales, July 12 to 18; Aibonito, January 30 (adult female); and Comerio, July 26 to 31.

In the U. S. National Museum there is an adult female shot by B. S. Bowdish, at Mayagüez, August 2, 1901, and a juvenile male from the same locality secured September 30. The latter is only recently from the nest and has a juvenile dress that differs from the adult plumage in a cinnamon wash on the breast, and cinnamon edgings to the feathers of back and wing coverts. A male was secured at Caguas on January 11, 1899, by J. D. Milligan. The naked space about the eye in this bird is marked as vermilion except for a crescent-shaped white spot below.

Struthers recently has found the lizard-cuckoo very common at Maricao and has seen it near Mayagüez. I identified bones of this species from material collected by H. E. Anthony in caves near Morovís and Utuado.

During my own collecting I secured an adult female, May 31, 1912, at Maricao and an adult male, June 22, 1912, in the vicinity of Lares that were near the pairing season, though others taken at the same time showed no indication of breeding. It appears from this that the period of nesting is irregular. Struthers noted a pair nest-building near Consomo, February 13, 1921.

In spite of its large size, this bird is inconspicuous, as its long tail, instead of making it prominent, aids its protective coloration by giving it rather an unbirdlike contour. It is very tame and shows little fear of man. In passing through the trees birds of this species keep to the densest foliage and make long pauses, during which they sit motionless, merely turning the head slightly. In early morning they may come out into dead trees or on exposed limbs to get the sun, where they sit with drooping wings and ruffled feathers. Though seen occasionally on the ground, they spend most of their time in bushes and trees. The ordinary

call-notes, which are heard frequently, are cuckoo-like and resemble the syllables *cow cow kuk krrk*, usually given disconnectedly. Sometimes one perches in the top of a tree, giving forth a sonorous note that is almost raven-like, and on one occasion I saw a bird standing on a limb with trembling wings, giving utterance to a low cooing note.

In some localities the name pájaro de agua was given these cuckoos, due to the belief that they called before an approaching rain—a prophecy that, thanks to the locality of their haunt, usually came true before the lapse of many hours. They were common inland in the coffee plantations, but were encountered in swampy forest near Mameyes and in other localities near the coast.

Though the bird consumes insect-eating lizards in quantity, it is not sufficiently common to be of economic injury and should not be molested.

The Newtons record a specimen secured by a collector of Apotheker Riise on Vieques and sent to them for examination, and Shelley has listed a specimen in the British Museum from the island of St. Thomas. There are no other records for the species outside the island of Porto Rico.

The lizard-cuckoo is one of the strangest of the indigenous birds of Porto Rico, colored plain grayish brown above, grayish on the breast and tawny on the abdomen and lower tail coverts. The long tail, tipped prominently with black and white, makes up more than one-half of the total length of fifteen or sixteen inches.

Subfamily CROTOPHAGINAE

Crotophaga ani Linnaeus

Ani, Black Witch, Judío

Crotophaga ani Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 105. (Jamaica.)

Ani, Knox, Hist. Acc. St. Thomas, W. I., 1852, p. 220 (St. Thomas).—Danforth, Bird-Lore, 1922, p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Crotophaga, Moritz, Wieg. Arch. Naturg., 1836, p. 381 (Porto Rico).

Crotophaga ani, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 201, 264 (listed).—Newton, Ibis, 1859, pp. 149-150 (St. Croix).—Cassin, Proc. Acad. Sci. Philadelphia, 1860, p. 377 (St. Thomas; specimens).—Taylor, Ibis, 1864, p. 170 (Porto Rico).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 256 (Porto Rico; specimens).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 600 (Porto Rico; specimens); Bello, Zool. Gart., 1871, p. 350 (listed).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 185; Anales Soc. Esp. Hist. Nat., 1878, p. 233 (Porto Rico; abundant).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 148 (Porto Rico; speci-

mens).—Ridgway, *Proc. U. S. Nat. Mus.*, 1884, Vol. VII, p. 172 (St. Thomas; specimens).—Cory, *Auk*, 1890, pp. 374, 375 (Anegada, Tortola, Virgin Gorda; specimens); *Auk*, 1891, p. 48 (St. Croix; specimen); *Cat. West Indian Birds*, 1892, p. 104 (Porto Rico, St. Croix, Tortola, Virgin Gorda, Anegada).—Bowditch, *Oölogist*, 1900, p. 72 (Vieques; specimens); *Auk*, 1902, p. 363 (Porto Rico; abundant).—Hartert, *Nov. Zool.*, 1902, Vol. IX, p. 279 (Ponce).—Wetmore, *U. S. Dept. Agric. Bull.* 326, 1916, pp. 59-62 (Porto Rico, Culebra); *Auk*, 1916, p. 413 (Vieques; specimens); *Auk*, 1917, pp. 55, 59 (Culebra, Culebrita).—Ridgway, *U. S. Nat. Mus. Bull.* 50, Pt. 7, p. 99 (Porto Rico, St. John, Tortola, Virgin Gorda, Anegada, St. Croix).—Struthers, *Auk*, 1923, p. 474 (Porto Rico).—Mortensen, *Atlanten*, 1909, Vol. VI, No. 66, pp. 642-644 (St. Croix).—Danforth, *Journ. Dept. Agric. Porto Rico*, 1926, Vol. X, pp. 88-91 (Cartagena Lagoon).

Porto Rico, Vieques, St. Croix, Culebra, Culebrita, St. Thomas, St. John, Anegada, Tortola, Virgin Gorda; resident and common in most, if not all, of the islands mentioned.

In Porto Rico during my work in 1912 the ani was recorded as follows: Manatí, July 7 to 11; Río Piedras, December 16, 1911, to January 4, 1912 (specimens taken); Mameyes, February 9 to 20 (specimens); Humacao, September 3 to 9 (specimen); Maunabo, May 11; Salinas, April 26 to May 2; Juana Diaz, August 17 to 22 (specimens); Yauco, May 16 to 28 (specimens); Cabo Rojo, August 24 to 31; Añasco, June 8 (specimen); Aguadilla, June 9 to 12; Utuado, August 3 to 9 (specimen); Adjuntas, August 14 and 15; Ciales (along the Río Manatí), July 12 to 18; Aibonito, January 26 to 31; Caguas, January 5 to 14 (specimen); and Hacienda Catalina, March 6. Anis are reported from Mayagüez and Cartagena Lagoon by Danforth; and near Ponce, by Hartert. There is a skin in the U. S. National Museum taken at Arroyo, February 3, 1899, by J. D. Milligan.

These strange birds are found in flocks that contain from half a dozen to twenty or more individuals, ranging mainly in pasture-lands, but going also into the cane-fields and orange groves to feed. In pastures they remain near the cattle, keeping ahead of them with long hops, in order to get the insects that the cattle scare up. Any intruder is greeted with a querulous call, and the whole flock flies in a straggling line across the fields to perch in a bush or low tree, where they crowd together and peer out curiously, their long tails and arched beaks giving them an odd appearance. In the early morning, when the grass is wet, they frequently sit in the sun with the wings extended in order to dry them or to absorb heat. The wings are small for the size of the bird, and the flight, accomplished by a series of steady wing beats alternating with short sails, is not strong. In a heavy wind the birds are almost

helpless, and they seldom rise high from the ground at any time. When on the wing, the back appears concave from the fact that the head and tail are held on a higher level.

In the heat of the day anis usually take refuge in dense clumps of bamboo along streams, remaining quietly out of the intense heat of the sun, and they also roost in these at night, as well as in mangroves around lagoons. The ordinary call-notes are a low *kur-r-rk* and a querulous *quee ick, quee ick*, varied by low chuckling notes. When the birds are at all wild, they serve to alarm the entire country, as they begin to call on the slightest provocation. They are most abundant on the coastal plain, but range in small numbers in the pastures at higher altitudes. They are birds of the open and never enter dense forests. Formerly they are said to have been more common in Porto Rico than at present, but to have lessened in numbers greatly since the introduction of the mongoose.

The breeding season varies considerably with different individuals. A female containing a fully formed egg was taken near Río Piedras, December 20, and breeding birds or young in first plumage were noted until field work was completed in September, so that anis nest apparently the year round. Although this species often builds a communal nest, this is not always the case. Near Cayey, January 22, two anis were seen constructing a nest in a tree about thirty feet above a small stream, the male sitting on a limb above while the female was in the nest, as yet only a loose mass of sticks and weeds. She moved and turned to shape it to her body, with her long tail sticking nearly straight up in the air. Near Bayamón, July 25, a single bird slipped quietly from a bulky nest in a clump of bamboos and only its mate appeared to join it. The nests seen were all large and bulky and were located from six to thirty feet above the ground. Bowdish reports a communal nest found near Aguadilla, August 13, built eight feet from the ground, in a thicket of bushes and trees. This nest contained twenty eggs, placed in layers of four or five, each layer being covered with dead leaves to separate it from the next lot of eggs above. Eight of the eggs were partly incubated and twelve were fresh. In his manuscript notes Bowdish has recorded anis as nest-building near Cataño on July 21, 1899.

On May 20 near Yauco three anis were seen in a tree in which several mozambiques had nests. The anis were very near these nests, and the blackbirds, together with a pair of gray kingbirds, were much excited, but appeared to be unable to drive out the intruders. It was certain that the anis were bent on robbing the nests, and one was shot in the act of

gulping down something which was later found to be an egg. No other instances of this evil habit were observed.

The ani was first reported from Vieques in 1900 by Bowdish, though a skin in the U. S. National Museum was collected on that island by J. D. Milligan, of the *Fish Hawk*, on February 7, 1899. I found these birds fairly common there in brushy pastures from March 16 to April 3, 1912, and secured skins on March 20, 23, 25 and 30. A nest found during the last week in March, six feet from the ground, in thorny bushes, was a bulky affair of twigs about two feet across, though as yet incomplete. Bowdish reports young taken January 28, 1900.

On Culebra Island the species was very common from April 5 to 21, 1912, and was found everywhere in the brush-grown pastures in little flocks. Its comparative abundance was due perhaps to the absence of the mongoose. The bird frequented the vicinity of cattle and, as the work bulls browsed along through the grass, the anis ran, hopped or flew in an endeavor to keep just ahead and secure the insects that were disturbed. Anis were seen on Culebrita Island April 15.

Knox reported them as conspicuous on St. Thomas in 1852, and Cassin received numerous skins from that island through Robert Swift. Benedict and Nye secured three birds from January 17 to 24, 1884, and there are several other skins from St. Thomas in the U. S. National Museum acquired through various sources. The Newtons found the species common on St. Croix, and Alfred Newton described a nest containing fourteen eggs, evidently common property of a flock, that was observed on June 18, 1857. Cory received skins from St. Croix in 1891, and there are two in the Museum of Comparative Zoölogy taken on St. Croix September 14 and 15, 1914, by G. K. Noble. Mortensen says that several birds may incubate simultaneously and records one nest containing one hundred fifty eggs placed in layers. There is a female ani in the U. S. National Museum secured by F. A. Ober on St. John, and Winch forwarded specimens to Cory from Tortola, Virgin Gorda and Anegada. One of the latter, now in the U. S. National Museum, was taken December 29, 1889.

From examination of more than forty stomachs I found that the ani feeds extensively on Orthoptera, beetles, caterpillars and bugs, consuming many of injurious habit, so that it is of decided benefit to agriculture. Small quantities of drupes are taken. I saw no sign of their having eaten ticks, in spite of popular superstition to that effect.

The ani, with its slender form, twelve or fourteen inches in length. blackish plumage and compressed, highly arched bill, from which it de-

rives its colloquial name of judfo, is an unmistakable member of the local avifauna.

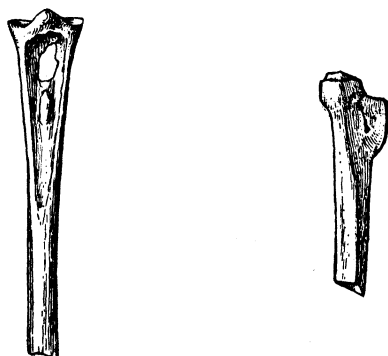
Order STRIGIFORMES

Family TYTONIDÆ

Tyto cavatica Wetmore

Porto Rican Barn Owl

Tyto cavatica Wetmore, Proc. Biol. Soc. Washington, December 30, 1920, Vol. 33, p. 80, Pl. 3, Figs. 3-6. (Utuado, Porto Rico.) Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 321-323, 3 figs. (Utuado).



THE EXTINCT PORTO RICAN BARN OWL (*Tyto cavatica*)

FIG. 17 (left).—Proximal end of left metatarsus (type). Anterior view. Natural size. From cavern deposits of Cueva Toraño.

FIG. 18 (right).—Proximal end of right metatarsus. Internal face. Natural size. From cavern deposits of Cueva Toraño.

(These cuts are reproduced by courtesy of The American Museum of Natural History.)

Porto Rico; extinct.

The Porto Rican barn owl, described from the upper end of a metatarsus (Figs. 17 and 18), is known only from the type, parts of another metatarsus, and two broken tibio-tarsi, secured by Mr. H. E. Anthony from a cave on the property of Don Gervacio Toraño near Utuado, in 1916. These indicate a form of small size related to the small West Indian species of the genus.

The bones of the barn owl in this cave aid in explaining the abundant remains of small birds and mammals found in various caves in Porto Rico. Examination of the bird bones from Cueva Catedral in particular led me to infer that the deposits came from pellets regurgitated by owls at their roosts—a belief rendered certain by the discovery first of remains

of the Múcaro (*Gymnasio nudipes nudipes*) and then of those of this barn owl.

In 1912, while traveling in Porto Rico, I made many inquiries regarding the Porto Rican owl, or Múcaro real (*Asio portoricensis*), and found two stories current concerning it. According to one tale, it was found in grassy places or marshes, the normal haunt of short-eared owls (to which group it belongs). Near Utuado, however, I was informed that it inhabited small caves amid the hills and appeared mainly at night. At the time I paid little attention to this story, but am now convinced that it related to the barn owl, since such birds are retiring, secretive in habit and adopt just such haunts. It is barely possible that scattered individuals of the barn owl may exist in isolated caves in the region in question. Though such possibility is remote, the matter is worthy of investigation by those who may have opportunity to work in that vicinity. The bones that supply our only knowledge of it at present do not seem to have any great antiquity.

Family STRIGIDAE

Gymnasio nudipes nudipes (Daudin)

Bare-legged Owl, Múcaro

- Strix nudipes* Daudin, Trait. Orn., 1800, Vol. II, p. 199. (Porto Rico.)—Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 202 (Porto Rico).
- Strix ferruginea*, Moritz, Wieg. Arch. Naturg., 1836, p. 392 (Porto Rico).
- Noctua nudipes*, Hartlaub, Isis, 1847, p. 611 (Porto Rico).
- Athene nudipes*, Bello, Zool. Gart., 1871, p. 349 (Porto Rico).
- Gymnoglaux krugii* Gundlach, Journ. für Ornith., 1874, pp. 310, 315 (Porto Rico).
- Gymnoglaux nudipes*, Gundlach, Journ. für Ornith., 1878, pp. 158, 164-165; Anales Soc. Esp. Hist. Nat., 1878, p. 166 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 58, 137 (Porto Rico, specimens).
- Gymnasio nudipes*, Cory, Cat. West Indian Birds, 1892, p. 100. (Porto Rico).—Bowditch, Auk, 1902, p. 362 (Mayagüez, specimens).—Wetmore, Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 320 (remains from caves, Utuado and Morovís).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 87-88, Fig. 40 (Mayagüez).
- Gymnasio nudipes nudipes*, Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 678 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 67-69, Pls. 5 and 6 (Porto Rico).—Struthers, Auk, 1923, p. 475 (Mayagüez).

Porto Rico; fairly common resident.

From its nocturnal habits, the Múcaro (Pl. LXII) is easily overlooked, so that my records of its occurrence in 1912 do not give an adequate idea

of its abundance. I found it at Mameyes, February 9 to 29 (specimen, February 12); Yauco, May 16 to 28 (reported); Cabo Rojo, August 24 to 31; Maricao, May 29 to June 5 (specimens, June 1); Lares, June 18 to July 1 (specimens, June 27); Utuado, August 3 to 9; Adjuntas, August 10 to 16; Aibonito, January 26 to February 5 (reported); Hacienda Catalina, below El Yunque, March 2 to 11 (specimen, March 4). In the U. S. National Museum there is a series taken at Mayagüez by B. S. Bowdish, from May 27 to July 26, 1901, and one shot at Caguas, January 9, 1899, by A. B. Baker. There were many remains of this owl in the cave deposits near Morovís and Utuado, and there is unquestionable ground for considering casts of this owl as responsible for part of the accumulation of bird and mammal remains found there.

On destruction of the original forests the little owl, like the woodpecker, found a refuge in the groves of trees grown for shade in the coffee plantations. It is most common in the interior and has been recorded especially in the western part of the island. I found it on the seacoast near Mameyes, but it is not common on the coastal plain, for there little cover is to be found.

The múcaro is entirely nocturnal in habit and during the day resorts to thickly leaved trees, dense growths of vines, or small caves, where it remains quietly at rest. The natives capture these owls rather easily by slipping a noose over their heads. On the rare occasions when the birds were flushed, I found their flight swift and entirely noiseless; they secreted themselves at once in a new cover, where it was difficult to locate them. From November to May they are frequently heard calling in early evening—a low, tremulous note like that of a screech owl. Another note, heard when the birds are frightened or excited, is a loud *boo boo* like that of a burrowing owl, and in fighting they utter a barking call. The small birds of the forest frequently discover the little owl hiding in the leaves and gather with great calling and commotion; the owl is entirely passive and remains motionless until they tire and go away. Near Maricao one flew out from a hole in a tree, attracted by the calling of a wing-tipped vireo.

The breeding season seems to extend from April to June. At Maricao I found on June 1 a young bird, perhaps a week old, in a hollow in a tree six feet from the ground. The nest was a damp cavity six or eight inches in diameter, with two or three epiphytes growing before the entrance. At Lares, on June 27, I secured a young individual not quite old enough to leave the nest, and Bowdish, at Mayagüez, secured young on May 29 and on June 10, 12 and 21, 1901. The last three were birds

that he had had in captivity since May 16. Gundlach says that the species deposits two eggs. The small bird, about a week old, that I took at Maricao was covered with white down and had down growing on the upper third of the tarsus, as in the adult. The second juvenal plumage is already showing on the main feather tracts in this bird. This second dress is a heavy, downy plumage, grayish white, heavily cross-barred with dusky. It is followed by the adult dress. The species has two distinct color phases: one bright reddish brown and one decidedly duller. Some specimens are heavily mottled on the lower surface, while in others the lower breast and abdomen are white streaked with dusky. The adult is eight or nine inches in length.

According to native stories, the little owl is fond of coffee and does much damage to the coffee crop by biting the ripened berries, sucking the juices from the sweet inner skin, and then letting the berry fall. When carefully questioned, most of those making this accusation admitted that no one has ever seen the bird doing this, though occasionally one or another insisted that he had witnessed it in the act. The truth of the matter seems to be that the owls are heard calling in the coffee plantations at night, and the next morning the berries are found on the ground; the better informed growers attribute the damage to rats, which are very probably the real culprits. I tested the matter with captive birds, but was unable to get them to touch ripe coffee berries, though they were denied other food for two days at a time. A large green grasshopper or a honey-creeper was, on the other hand, accepted and eaten without hesitation. According to Danforth, the experiment has been repeated with the same result by Miss Rosario Brito, of Mayagüez. The owls were accused, as well, of eating gonduros (*Cajanus cajan*), a species of legume, but without proof of any kind.

In the stomachs of those that I examined I found only animal matter, including large insects, such as Orthoptera (including the changa, or mole cricket), many beetles (of which one bird had eaten eight), cane-weevils, root-borers (*Diaprepes*), moths, a scorpion, lizards and small birds (a redstart and a Carib grassquit). There was no trace of any vegetable matter and such a diet must be regarded as wholly improbable. The facts in the case are in all likelihood properly represented by a stanza in one of the songs of the *gíbaros* (hill people) that runs as follows:

"Abre Múcaro los ojos;
Otro pájaro et engaña.
Otro espipita el café,
Y tu trapao en la rama!"

Gymnasio nudipes newtoni (Lawrence)

Newton's Owl

Gymnoglaux newtoni Lawrence, Ann. Lyc. Nat. Hist. New York, 1860, Vol. VII, p. 259. (St. Croix.)

Owl, Knox, Hist. Acc. St. Thomas, W. I., 1852, p. 221 (St. Thomas).

Scops porto-ricensis, Newton, Ibis, 1860, p. 307 (St. Thomas, specimen).

Gymnoglaux nudipes, Newton, Ibis, 1859, pp. 64-66 (St. Croix, specimens); Ibis, 1860, p. 307 (St. John, specimens).—Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, pp. 374-375 (St. Thomas, specimens).—Mortensen, Atlanten, 1909, Vol. VI, No. 66, p. 640 (St. Croix).

Gymnasio nudipes, Cory, Cat. West Indian Birds, 1892, p. 100 (St. Thomas, St. John, St. Croix).

Gymnasio nudipes newtoni, Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 679 (St. Thomas, St. John, St. Croix).

St. Croix, St. Thomas, St. John; resident.

This eastern form of the bare-legged owl is represented in the U. S. National Museum by two skins from St. Thomas, one taken by A. H. Riise and the other by Robert Swift. These two differ from ten adults from Porto Rico in being duller and grayer, less rufescent above. Other alleged differences do not hold. The St. Thomas specimens appear similar in size to the bird of Porto Rico.

This owl has never been reported in numbers. On St. Croix the Newtons had one young bird from the Great Fountain estate, May 30, 1857, an adult "a few days after," and a male taken on May 11, 1858, as well as a young bird secured September 1, 1858, from the Estate Allendale. The Newtons were told that the bird was heard calling at the River and Great Fountain estates, but were unable personally to find it. Owls have not been recorded on St. Croix by subsequent collectors and may now be extinct there.

On St. Thomas Knox reports an owl as rare. Swift and Riise both obtained specimens, and the latter brought Alfred Newton skins and two eggs from that island, as well as several skins from St. John. One of the latter is said to have been "remarkable for the bright hue of its plumage," which suggests that the characters supposed to separate *newtoni* from typical *nudipes* may not hold.

On Vieques Island, in 1912, Señor José Barton told me that several years previously he had seen a small owl at close range in the hills at

the eastern end of the island. No one else knew of owls, so that they must be extremely rare. The record is included under *newtoni* on basis of probability.

***Asio portoricensis* Ridgway**

Porto Rican Short-eared Owl, Múcaro Real, Múcaro de Sabana, Múcaro de Melón, Coruja, Llorona

Asio portoricensis Ridgway, Proc. U. S. Nat. Mus., 1882, Vol. IV, p. 366. (Porto Rico.)

Strix brachyotus, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 60 (Porto Rico).

Brachyotus cassinii, Gundlach, Journ. für Ornith., 1874, p. 310; Journ. für Ornith., 1878, pp. 158, 164; Anales Soc. Esp. Hist. Nat., 1878, p. 165 (specimens taken by Blanco and Stahl).—Stahl, Faun. Puerto Rico, 1883, pp. 58, 137 (Porto Rico; 2 specimens); Ornith., 1887, p. 450 (Porto Rico).

Asio portoricensis, Cory, Auk, 1886, p. 468 (Porto Rico); Cat. West Indian Birds, 1892, pp. 100, 132 (Porto Rico).—Bowdish, Auk, 1902, p. 361 (seen, San Juan Bay).—Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 668 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 67 (Porto Rico).

Porto Rico; rare.

The Porto Rican short-eared owl is distinguished from the continental species by smaller size, larger bill and feet, and greater extent of dark-brown color of upper surface. The bird is about fifteen inches in length. The iris is yellow. It has not been common in recent times. Gundlach in the seventies of the last century did not see it except in the form of specimens in the collections of Blanco and Stahl, though the bird was reported to him from Toa Baja, Furnias and Utuado. Bowdish saw this owl near San Juan Bay, February 12, 1900, but did not secure it. In 1912 natives informed me that they saw it at intervals in the grass fields near Río Piedras, and I was told of its occurrence at times in the lower foothills above Mameyes, near Salinas, Utuado and Lares. I did not succeed in finding the bird. Near Lares peons said that these owls steal the hats of pedestrians who pass at night and carry them off to serve as nests!

In the Carnegie Museum is a skin of a young male only recently from the nest, taken at Utuado, May 20, 1912, by W. W. Worthington. Like adults that I have seen, this specimen is very dark on the dorsal surface. The ear-tuffs are fairly well developed.

The latest records for the bird known to me are supplied by Mr. F. A. Potts, who, under date of May 15, 1921, writes: "In August, 1919, I flushed one in a patch of malojillo grass bordering a cane-field three miles

south of Juana Diaz. Also a member of our engineering department has informed me that his men flushed two in a large pasture north of Santa Isabel. The cane guard on the Esperanza estate, two miles west of Aguirre, told me he had shot one and seen others." Under a later date he states that he has seen it near Arroyo and twice between Santa Isabel and Ponce, last on July 5, 1925. More recently still he has forwarded to the National Museum the skin of a female taken near Fortuna, April 8, 1927.

This owl rests habitually on the ground in grass or other heavy vegetation, so that its decrease in numbers is without doubt to be attributed to the mongoose.

The U. S. National Museum has three skins, including the type, and there is one, as noted above, in the Carnegie Museum. There are, in addition, specimens in the American Museum of Natural History and in the Museum of Comparative Zoölogy. The specimen in the latter institution (received in exchange from the American Museum) is marked "Porto Rico, J. Gundlach," but there is no indication as to how Gundlach secured it.

Order CAPRIMULGIFORMES

Suborder CAPRIMULGI

Family CAPRIMULGIDAE

Subfamily CAPRIMULGINAE

Antrostomus carolinensis (Gmelin)

Chuck-will's-widow, Guabairo, Capacho

Caprimulgus carolinensis Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 1028. (Carolina.)

Antrostomus carolinensis, Gundlach, Journ. für Ornith., 1878, pp. 159, 172; Anales Soc. Esp. Hist. Nat., 1878, p. 201 (Coamo Springs, Arecibo, specimens).—Stahl, Faun. Puerto Rico, 1883, p. 61 (Porto Rico, migrant).—Cory, Auk, 1886, p. 341 (Porto Rico); Cat. West Indian Birds, 1892, p. 105 (Porto Rico).—Bowditch, Oölogist, 1900, p. 72 (Vieques, specimens); Auk, 1902, p. 365 (Vieques, specimens).—Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 508 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 69 (Porto Rico, specimen; Vieques); Auk, 1916, p. 414 (Vieques).

Porto Rico; Vieques; winter visitant, rare.

Gundlach informs us that Krug sent him a specimen of chuck-will's-widow from Coamo Springs, and that he received another from Hjal-

marson, taken at Arecibo in February, 1876. Stahl did not possess a specimen and apparently knew of it only through Gundlach's records.

Toward the last of December, 1911, I saw one of these birds in a small second-growth forest above the experiment station at Río Piedras and on January 11, 1912, Señor José T. Monclova, of Río Piedras, gave me a fine bird that had been brought in alive by some boys. This proved to be a female. On Vieques Island Bowdish shot two females on December 15 and 28, 1899, and reports a number seen. These comprise the only records for the area under consideration.

The chuck-will's-widow has a loose plumage colored softly with blended brown, black and buff, and is distinguished by its tremendous mouth. It is about eleven inches in length. The bird is migrant from the United States and is entirely nocturnal; in consequence it is only flushed by chance in the dense growth in which it hides by day. As it rests frequently on the ground, the mongoose must be a serious enemy.

***Antrostomus noctitherus* (Wetmore)**

Porto Rican Whippoorwill, Guabairo Chico, Guaraiba

- Setochalcis noctithera* Wetmore, Proc. Biol. Soc. Washington, December 31, 1919, Vol. 32, p. 235. (Porto Rico.) Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 323-324, 1 figure (bones from caves near Morovis).
Antrostomus vociferus, Cory, Auk, 1889, p. 279 (Porto Rico, specimen); Cat. West Indian Birds, 1892, pp. 105, 143 (Porto Rico).
Antrostomus vociferus vociferus, Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 518 (Porto Rico).

Porto Rico, resident; possibly now extinct.

While identifying a collection of bones of birds secured by H. E. Anthony, of the American Museum of Natural History, in Porto Rican caves, I came upon several humeri of a whippoorwill of a species distinct from the bird of North America. This brought to mind a specimen of whippoorwill collected by Clark P. Streater in Porto Rico and recorded by Cory as *Antrostomus vociferus*, which had stood for years as the only record of this North American species in the West Indies. On borrowing this specimen from the Field Museum I found that it was in fact my unnamed form, so that I described the species from this skin. The type, and only known skin, a female, differs from the female of *Antrostomus v. vociferus* (Wilson) in shorter wing, more rufescent, paler markings; heavier black tips on feathers of breast, prominent spots of cartridge buff on breast, and restriction of the light bars on the three outer rectrices.

Three humeri and a metacarpal secured by Anthony in Cueva Clara

and Cueva Catedral near Morovís give us the only definite points of occurrence for the species, since the type skin is merely marked from Porto Rico. In line with the lessened length of wing in *noctitherus*, the humerus is distinctly shorter than that of *vociferus* and has characters of form that also serve to distinguish it.

The species may still exist in small numbers, for on December 23, 1911, I flushed a small goatsucker that I did not secure in a tract of second-growth forest above the experiment station at Río Piedras. I was told, too, of a bird that in former times called loudly and continuously by night, but that no one was ever able to see. This bird had not been heard in years. As whippoorwills have a call given regularly during the night hours through the breeding season, it is possible that this night-caller may have been the bird under discussion.

The species must have been decimated by the mongoose, since whippoorwills nest and rest on the ground in dense thickets during the day and are active only at night.

Oberholser has separated the whippoorwills from *Antrostomus* under the generic name *Setochalcis*. After consideration of the characters now known, I believe that the proposed group has only subgeneric value and here place the Porto Rican whippoorwill in the genus *Antrostomus*.

Subfamily CHORDEILINAE

Chordeiles minor gundlachii Lawrence

Cuban Night-hawk, Capacho, Cregueté, Querequeté

Chordeiles gundlachii Lawrence, Ann. Lyc. Nat. Hist. New York, December, 1856, Vol. VI, p. 165. (Cuba.)

Caprimulgus popetue, Bello, Zool. Gart., 1871, p. 349 (Porto Rico).

Chordeiles virginianus, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 600 (Porto Rico, specimen).

Chordeiles minor, Gundlach, Journ. für Ornith., 1874, p. 311 (Porto Rico, coll. Hjalmarson and Blanco); Journ. für Ornith., 1878, pp. 160, 172-173 (Vega Baja, Dorado, Bayamón, Mayagüez); Anales Soc. Esp. Hist. Nat., 1878, p. 202 (Vega Baja, San Juan).—Stahl, Ornith., 1887, p. 453 (Porto Rico, breeds).

Chordeiles virginianus minor, Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 576 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 69-70 (Porto Rico).—Struthers, Auk, 1923, p. 474 (Cabo Rojo, specimen; Mayagüez).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 93 (Cartagena Lagoon).

Porto Rico, rare.

Hjalmarson secured a specimen of a nighthawk near Arecibo, and Dr. Bello had fragments of one from near Mayagüez. These were ex-

amined by Gundlach, who observed the bird near Vega Baja, Dorado, Bayamón and San Juan, but does not state that he secured specimens. There is an old skin without data in the U. S. National Museum that represents the subspecies here under discussion.

Mr. F. A. Potts, in a letter written August 5, 1923, states that he had seen nighthawks several times and had recorded sixteen on August 4. He has found the bird from May 26 to August 25. Struthers reports a male taken near the Cabo Rojo lighthouse on August 9, 1921, and one seen August 18, 1921, at Mayagüez. Danforth has noted single birds flying at Cartagena Lagoon, May 27, June 7 and 28, 1924. Stahl has reported the nighthawk as nesting in Porto Rico, arriving in April and leaving in October. I know of no definite breeding record at this time and am inclined to believe that this nighthawk may be migrant from Cuba, where it nests commonly, but departs in fall for some winter home as yet unknown. These migrants may pass through Porto Rico. The fact that the only two skins I have seen represent respectively the Cuban and Bahaman races renders the allocation of Porto Rican records difficult. They have been included here as a matter of convenience.

The nighthawk is easily recognizable; for, though in part crepuscular in habit, it flies regularly by day. It is about nine inches in length, has long wings with a distinct light patch across the primaries, and flies with strong zigzag flight that carries it gracefully across the open fields and pastures.

***Chordeiles minor vicinus* Riley**

Bahaman Nighthawk

Chordeiles virginianus vicinus Riley, Auk, 1903, p. 432. (Long Island, Bahama Islands.)

Chordeiles minor, Stahl, Faun. Puerto Rico, 1883, pp. 66, 146 (Porto Rico, specimen).

Porto Rico, migrant; status uncertain.

In the Museum of Comparative Zoölogy there is a mounted nighthawk, a female (No. 29040), taken in Porto Rico by Dr. A. Stahl, but without more definite data; it is supposed to be the female bird that Stahl in his work on the fauna of Porto Rico listed as in his collection. This bird is in rufescent phase, with preponderance of the paler markings and restriction of the darker ones. It is distinctly lighter than a series of *C. m. gundlachi* from Cuba and agrees in color with skins from the Bahama Islands. It measures as follows: wing, 168.5; tail, 95.8; culmen.

5.6 mm. I have identified it as the Bahaman nighthawk *vicinus* (in which Mr. O. Bangs agrees) and consider it a migrant.

This race is said to be a summer resident in the Bahama Islands and disappears to an unknown winter home in autumn. Its occurrence in Porto Rico, therefore, is not to be unexpected.

Additional material is needed to establish the status of the two forms of night hawk now recorded from Porto Rico. From the geographic position of the island, the Bahama race should occur regularly in passage in spring and fall.

Order MICROPODIIFORMES

Suborder MICROPODII

Family MICROPODIDAE

Subfamily CHAETURINAE

Nephoecetes niger niger (Gmelin)

Antillean Black Swift, Vencejo, "Golondrina"

Hirundo nigra Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 1025. (Santo Domingo.)

Cypseloides niger, Cory, Cat. West Indian Birds, 1892, p. 105 (Porto Rico).—Bowdish, Auk, 1902, p. 366 (Porto Rico, seen).

?*Nephoetaes*, Gundlach, Journ. für Ornith., 1874, p. 311 (Porto Rico).

Nephoetaes niger, Gundlach, Journ. für Ornith., 1878, pp. 159, 172 (Porto Rico, specimen); Anales Soc. Esp. Hist. Nat., 1878, p. 200 (Lares, Quebradillas, Arecibo, Mayagüez, Utuado, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 146 (Porto Rico, specimen).

Nephoecetes niger niger, Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 94 (Anegado Lagoon, Filial Amor, Guayanilla, Mayagüez).

Nephoecetes niger jamaicensis, Ridgway, U. S. Nat. Mus. Bull. 50, 1911, Pt. 5, p. 706 (Porto Rico?).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 74-75 (Río Piedras, Lares; Yabucoa, specimen).—Struthers, Auk, 1923, p. 475 (Guánica, Mayagüez, Cartagena Lagoon).

Porto Rico; tolerably common.

The black swift is one of the resident birds of Porto Rico that is seen only under favorable circumstances. Gundlach observed individuals at Lares, Quebradillas, Arecibo and Mayagüez, and finally at Utuado encountered them under such conditions that he was able to collect both adults and young. Bowdish saw them but did not secure skins.

On December 16, 1911, I observed one flying over an open field near the experiment station at Río Piedras. On May 4, 1912, two circled high above the ground over open pastures near Yabucoa, moving swiftly in

great circles. By a fortunate shot I secured one; the second, after dashing past its falling companion twice, disappeared. Single individuals were seen near Lares, June 21, 22 and 26.

Mr. F. A. Potts has written me of several encounters with this bird. On April 20, 1919, while he was standing on the bald rock at the summit of El Yunque, five or six were observed flying above the peak. Others were noted that autumn near the Coamo River west of Santa Isabel. On June 8, 1920, Potts saw one near San Germán, and July 8, 1921, five; July 15 he recorded thirteen near Santa Isabel. He reports the bird common in summer from Guánica to Santa Isabel and has seen one hundred in a flock. S. T. Danforth has noted it as follows: Mayagüez, March 31 to July 28; Filial Amor, May 16; Guayanilla, June 28, and Anegado Lagoon, March 29. There is a female in the Carnegie Museum, taken at Utuado, May 17, 1912, by W. W. Worthington.

Whether the species is resident or not is still open to question, though my record for December would indicate that some individuals remain for the winter. Other notes now available pertain to the period from the end of March to autumn, so far as they are accompanied by dates.

The black swift, though of swallow-like appearance, may be told by its swifter flight and more rapid wing-motion. It is sooty black in color with grayish white markings in front of the eye.

Griscom¹⁶ has concluded that the black swifts of the Antilles all belong to one subspecies, a statement in which I agree after comparison of available material. The female that I secured at Yabucoa resembles others seen from Haiti and Jamaica. It is a fully adult bird, with light edgings on the feathers of the abdomen and with only the faintest indication of them on the under tail coverts. Measurements of this specimen are as follows: wing, 145.3 mm.; tail, 54.4 mm.; culmen from base, 6.5 mm.; tarsus, 11.8 mm.

The black swift has not been reported as yet from the Virgin Islands.

Suborder TROCHILI

Family TROCHILIDAE

Subfamily TROCHILINAE

***Orthorhyncus exilis exilis* (Gmelin)**

Gilt-crested Hummingbird, Doctor-Bird, Zumbador

Trochilus exilis Gmelin, Syst. Nat., 1788, Vol. I, Pt. 1, p. 484. ("Gujana")

¹⁶ Auk, 1924, p. 71.

St. Kitts.¹⁷)—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 600. (St. Bartholomew.)

Bellona exilis, Cory, Auk, 1886, p. 357 (Porto Rico, St. Thomas, St. Croix); Auk, 1889, p. 218 (Porto Rico, St. Thomas, St. Croix); Auk, 1890, pp. 374, 375 (Anegada, Virgin Gorda, specimens); Auk, 1891, p. 48 (St. Croix, specimen); Cat. West Indian Birds, 1892, p. 107 (Porto Rico, St. Thomas, Virgin Gorda, Anegada, St. Croix).—Mortensen, Atlanten, 1909, Vol. VI, No. 66, p. 644 (St. Croix).

Orthorhynchus exilis, Newton, Ibis, 1859, p. 141 (St. Croix, St. Thomas; specimens).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, p. 182; Anales Soc. Esp. Hist. Nat., 1878, p. 224 (specimen in Hjalmarson collection from St. Bartholomew).

Orthorhynchus exilis exilis Ridgway, U. S. Nat. Mus. Bull. 50, 1911, Pt. 5, pp. 659-660 (Virgin Gorda, Anegada, St. Croix, St. Thomas).

Microlyssa exilis exilis, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 70 (Vieques, Culebra, Porto Rico?); Auk, 1916, p. 414 (Vieques, specimens; Porto Rico?); Auk, 1917, pp. 59-60 (Culebra, specimen).

Porto Rico (?), Vieques, Culebra, St. Croix, St. Thomas, Virgin Gorda, Anegada, probably resident.

This beautiful hummer was the first bird that came to my hand when I began the collection of specimens on Vieques Island, March 18, 1912. It was fairly common in suitable localities and was found at blossoms of the muñeco, the cultivated legume known as gonduro (*Cajanus cajan*), and an acacia known as rallo (*Vachellia farnesiana*). The birds were sprightly and active and made a loud humming in flight, but otherwise were silent. Among other hummers they were distinguished by their small size. Specimens were taken March 18, 19, 23 and 29. Mr. B. S. Bowdish and Dr. C. W. Richmond both had collected on Vieques previous to my visit, but at an earlier time in the year. Neither reported this hummer, which indicates perhaps that it is migrant here. However, such tiny birds may be overlooked except when conspicuous food plants bring them to one's attention, and the species may, therefore, have evaded their observation.

On Culebra Island I shot a female among mangroves and thought at times that I saw others, but was never certain of their identity.

There are four skins from St. Thomas in the collections of the U. S. National Museum, and the Newtons record skins from this island. Specimens from this source are noted also in the Catalogue of Birds of the British Museum (1892, Vol. XVI, p. 355).

Edward Newton shot a female at Southgate Farm, on the north shore

¹⁷ Designated by Cory, Field Mus. Nat. Hist., Zool. ser., 1918, Vol. XIII, Pt. 2, No. 1, p. 305.

of the eastern end of St. Croix, June 8, 1858, and saw another here as well as one at Salt River. Cory also obtained a specimen from this island and additional skins from Anegada and Virgin Gorda. One of his skins from Anegada, taken by Cyrus S. Winch on December 26, 1899, is in the U. S. National Museum.

Occurrence of the species on Porto Rico proper is somewhat uncertain. The various records cited for that island seem to refer to the account of Sundevall, whose complete statement in his report of Hjalmarson's collection is as follows (from reference cited above):

41. *Trochilus* (Orthorhynchus) *exilis* Gould;—Taylor l. c.—Frequens; 3 specimina, ♂ ♀ allata. Conf. supra, aves ex S:t Barthelemy.
42. *Trochilus* (Lampornis) *holosericeus* L.—Plures, ♂ ♀, simillimi illis ex S:t Barthelemy. (A. cl. Taylor in Martinique et Dominica, non in Portorico inventus.)

In his introduction Sundevall mentions specimens received through Dr. Goës from St. Bartholomew and lists these in the report. It is evident from his statements that he indicates this species and *holosericeus* from St. Bartholomew and not from Porto Rico. Two of the skins examined by Sundevall are in the U. S. National Museum; both marked as from Hjalmarson, one given as from St. Bartholomew and the other (U. S. N. M. No. 14913) as from Porto Rico. It is on this last specimen that Porto Rican records are based. I consider the locality marked on it as erroneous.

Gundlach¹⁸ has the following comment on this matter:

"En mi segundo viaje á Puerto-Rico en 1875-76 volví á ver con atencion el ejemplar de la coleccion de Hjalmarson en Arecibo, y encontré que tenía una tarjeta con la palabra *Saint Bartholome*, escrita por otra persona y no por Hjalmarson, quien preguntado por mí de nuevo, me dijo que no se acordaba si él habia tenido ejemplares muertos en la isla de Puerto-Rico, ó si los ejemplares vistos por Sundevall habian provenido de la isla de Saint-Bartholome ó otra, y habian dado, como enviados por él, motivo a creerlos puerto-riqueños. Así aunque la lista de Sundevall diga frecuentemente tres ejemplares ♂ y ♀, y aunque cite á Taylor, hemos creído deber suprimir esta especie del catálogo puerto-riqueño, porque más vale no mencionar una especie como habitante que poner una que no lo es."

On the other hand, Mr. F. A. Potts informs me that he saw one of these humming birds, January 11, 1924, southwest of Ponce.

¹⁸ Anales Soc. Esp. Hist. Nat., 1878, p. 225.

[Archilochus colubris (Linnaeus)]

Ruby-throated Hummingbird

- Trochilus colubris* Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 120. (Carolina to New England.)—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 180; Anales Soc. Esp. Hist. Nat., 1878, p. 221 (pictured in album of Blanco).—Cory, Auk, 1886, p. 353 (Porto Rico); Cat. West Indian Birds, 1892, p. 107 (Porto Rico).
Archilochis colubris, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 70 (Porto Rico, hypothetical).

Gundlach included the ruby-throated hummingbird, a species that breeds in eastern North America and migrates south in winter, in his list of Porto Rican birds on the basis of a drawing seen in the album of Blanco. There is no other record and the species is considered of too doubtful occurrence to be included on this evidence. It is casual on the north coast of Cuba and is reported from Bermuda and the Bahamas, but is only found regularly in winter from Florida, Louisiana and Texas south through Mexico to Panama.]

Chlorostilbon maugaeus (Audebert and Vieillot)

Porto Rican Emerald, Fork-tailed Hummingbird, Zumbador, Zumzum,
 Colibri, Zumbadoreito

- Trochilus maugaeus* Audebert and Vieillot, Ois. Dor., 1801, Vol. I, pp. 71-79, 80, 93, Pls. 37, 38. (Porto Rico.)
 Fork-tailed Humming Bird, Danforth, Bird-Lore, 1922, p. 52 (Mayagüez).
Chlorestes gertrudis Gundlach, Journ. für Ornith., 1874, pp. 312, 315. Described as new from Porto Rico.)
Trochilus maugaei, Hartlaub, Isis, 1847, p. 611 (Porto Rico).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 600 (listed).
Sporadinus maugei, Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 182-183 (Porto Rico, specimens).—Cory, Auk, 1886, p. 359 (Porto Rico); Auk, 1892, p. 229 (Porto Rico); Cat. West Indian Birds, 1892, pp. 107, 132 (Porto Rico).—Bowditch, Auk, 1902, p. 366 (Mayagüez, Las Marías).
Chlorolampis maugaeus, Gundlach, Anales Soc. Esp. Hist. Nat., 1878, p. 225 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 145 (Porto Rico, specimen).
Chlorostilbon maugaei, Ridgway, U. S. Nat. Mus. Bull. 50, 1911, Pt. 5, p. 550 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 70-71 (Porto Rico).—Struthers, Auk, 1923, p. 475 (Maricao, nesting).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 94-95 (Cartagena Lagoon, Mayagüez).

Porto Rico; resident, fairly common, particularly in the coffee plantations and forested hills of the interior.

During 1912 I recorded it as follows: Manatí, July 7 to 11; Salinas, April 30 (specimen); Juana Diaz, August 17 to 22 (specimen); Yauco, May 16 to 28 (specimens); Cabo Rojo, August 24 to 31 (specimen); Maricao, May 29 to June 5 (specimens); Lares, June 18 to July 1 (specimens); Utuado, August 3 to 9 (specimens); Adjuntas, August 10 to 16 (specimens); Ciales, July 12 to 18 (specimen); Aibonito, January 26 to February 5 (specimens); Hacienda Catalina, March 4 and 6 (specimens), and at 2500 feet altitude on El Yunque, March 8.

This hummer is most abundant on the western end of the island beyond Aibonito. It was observed in the coastal region on the north side of the island only at Manatí, but on the south side was recorded from Salinas, Juana Diaz, Yauco and Cabo Rojo. There are specimens in the U. S. National Museum from Mayagüez and Ponce.

On the eastern portion of the island I found the birds only on El Yunque, where they occurred sparingly up to 2500 feet elevation. The fork-tailed hummer prefers deep shade, and is usually found only where there is forest growth, though on shaded slopes high in the mountains it was sometimes seen feeding in the open among low bushes. The shade of coffee plantations is grateful to these birds, and here they use low perches, only going higher on cool, damp mornings to rest on dead limbs in the sun. Many times the humming of their wings was heard when the birds themselves could not be located in the dense shadows. They are very pugnacious and pursue one another with sharp, squeaking notes.

The breeding season begins apparently the first of February, and full-grown young were common near Lares in June. Struthers reports a nest containing two eggs at Maricao, March 23, 1921.

The adults molt in May and June and regain the full plumage by August 1. These birds were frequently observed working rapidly over and under the limbs of trees and about the leaves and twigs of the coffee, as well as feeding at flowers. Their food consists of tiny insects and spiders.

The species is easily recognized as the smallest of the humming birds found on Porto Rico proper. The male is shining green throughout, with bluish tail and black wings. The female is light green above and whitish below. The two long outer tail feathers in the male are very loosely affixed and are easily lost. In the male the base of the mandible is flesh color and the rest of the bill black. In females the bill is

entirely black. In the young males the flesh-colored base of the mandible is less sharply defined anteriorly than it is in the adults.

Simon¹⁹ includes the Porto Rican species with *C. gibsoni* of Colombia in a genus *Chlorolampis*, distinct from *Chlorostilbon*. I see no justification for this action.

***Sericotes holosericeus holosericeus* (Linnaeus)**

Green Carib, Blue-breasted Hummingbird. Doctor-Bird, Zumbador

Trochilus holosericeus Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 120. (America.)

Lampornis holosericeus, Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, p. 160; Anales Soc. Esp. Hist. Nat., 1878, p. 224 (Manatí and Vega Baja; specimens taken by Hjalmarson).—Stahl, Faun. Puerto Rico, 1883, p. 61 (listed on statement of Hjalmarson).

Eulampis chlorolaemus, Newton, Ibis, 1859, pp. 138-141 (St. Croix).

Eulampis holosericeus, Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 377 (St. Thomas).—Cory, Auk, 1890, pp. 374, 375 (Anegada, Tortola, Virgin Gorda, specimens); Auk, 1891, p. 48 (St. Croix, specimen); Cory, Cat. West Indian Birds, 1892, p. 106 (St. Thomas, Tortola, Virgin Gorda, Anegada, St. Croix).—Hartert, Nov. Zool., 1902, Vol. IX, p. 276 (St. Thomas, specimen).—Nicoll, Ibis, 1904, p. 576 (St. Croix, St. Thomas, specimen).

Sericotes holosericeus, Mortensen, Atlanten, 1909, Vol. VI, No. 66, p. 644 (St. Croix).

Sericotes holosericeus holosericeus, Ridgway, U. S. Nat. Mus. Bull. 50, 1911, Pt. 5, p. 475 (St. Croix, Anegada, Virgin Gorda, Tortola, St. John, St. Thomas, Culebra).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 71-72 (Vieques, Culebra, Culebrita, Porto Rico); Auk, 1916, pp. 414-415 (Vieques, specimens); Auk, 1917, pp. 55, 60 (Culebra, Culebrita).—Cory, Field Mus. Nat. Hist., Zool. Ser., 1918, Vol. XIII, Pt. 2, No. 1, pp. 227-228 (Virgin Gorda, St. Thomas, St. Croix, Anegada, specimens).

Porto Rico, found near Fajardo, possibly elsewhere; Vieques, Culebra, Culebrita, St. Croix, St. Thomas, St. John, Tortola, Virgin Gorda, Anegada, supposed to be resident.

In the Carnegie Museum there are three males taken at Fajardo, Porto Rico, on February 19, 24 and 26, 1912, by W. W. Worthington. Gundlach informs us that in 1873 he examined two skins in the collection of Hjalmarson which the latter informed him had been taken by friends near Manatí and Vega Baja. There is territory favorable to the species on the east and south coasts, but its distribution and occurrence in Porto Rico at present are uncertain.

¹⁹ Hist. Nat. Troch., 1921, p. 64.

On Vieques Island, from March 15 to April 3, I found this hummer common and collected a series of seven specimens (March 18 and 23). The species had not been observed here previous to my visit, and at one time I thought that it might possibly be migrant, but now believe it resident. The birds were seen in forested areas, where they sought shade during the middle of the day, and were most active when the sun was low. They are large and fly swiftly, but seem less adroit on the wing than some other hummers, as they perch frequently while feeding at flowers instead of poising constantly in air. The flowers of the gonduro, a cultivated legume, were especially attractive. Always after a short period of feeding they stop to rest on some twig for a few minutes. Females taken March 23 were feeding young.

The species was first collected on Culebra Island on February 9 and 12, 1899, by A. B. Baker, of the *Fish Hawk*. From April 5 to 21, 1912, I found it common and secured a series of fifteen skins from April 6 to 20. One was taken on Culebrita, April 15. The birds were common everywhere about tree growth, but were especially abundant in the mangroves bordering the bays and lagoons. They were sprightly and active and came frequently, with apparent curiosity, to watch me close at hand. By April 10 I observed them nest-building in the mangroves and the breeding season was well under way at the time of my departure. As the birds visited their nests without fear, it was a simple matter to find them. On several occasions I was astonished to observe a female going directly to its home within a few feet of my head.

The material used for nests was mainly a soft, cottony down from a species of cactus, while the exterior was covered with lichens. Nests were placed on small limbs from ten to thirty feet above the ground. One collected on April 19 contained two heavily incubated white eggs. Others seen at the same time were still empty. Intruding honey-creepers and warblers were driven away through the tree tops with a loud rattle of wings that I heard on many occasions, but always without being able to determine definitely how it was made. The common note was a sharp *chewp*, and in ordinary flight the wings made a loud buzzing.

The birds were seen flying across from the main island to Louis Peña.

The Newtons record this species as the only common hummer on St. Croix, and found it breeding from the end of March to the first of June; the nests were placed from five to fifteen feet above the ground and contained two white eggs. Cory received two specimens from St. Croix in 1891, and M. J. Nicoll has reported it as common and the only hum-

mer seen from February 19 to 21, 1904. There is a male in the Museum of Comparative Zoölogy taken by G. K. Noble, June 19, 1914.

The Newtons report the bird as common on St. Thomas, and Cassin received numerous specimens from there taken by Robert Swift. The U. S. National Museum has two from this collector and two remaining from a series of sixteen received from the dealer and taxidermist, John Akhurst (catalogued March 5, 1863). One of these is a young bird just fledged, perhaps taken from the nest, as the tail is less than half an inch long. It shows no trace as yet of the blue breast spot. Hartert collected a bird of this species near Charlotte Amalie in May, 1892, and Nicoll secured it from February 21 to 24, 1904. Cory records one from St. Thomas in the Field Museum.

Dr. Lund reported this species to the Newtons from St. John, and in the U. S. National Museum there are two skins from that island taken by F. A. Ober.

Winch forwarded specimens to Cory from Anegada, Tortola and Virgin Gorda.

The species is somewhat more than four inches in length, with a long, slightly curved, black bill. It is green, with the tail and a spot on the breast metallic blue.

Anthracothorax viridis (Audebert and Vieillot)

Green Mango, Zumbador Verde, Zumbador

Trochilus viridis Audebert and Vieillot, Ois. Dor., 1801, Vol. I, p. 34, Pl. 15 ("fles de l'Amerique Septentrionale"—Porto Rico²⁰).—Hartlaub, Isis, 1847, p. 611 (listed).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 600 (Porto Rico).

Lampornis viridis, Taylor, Ibis, 1864, p. 169 (Porto Rico).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, p. 160; Anales Soc. Esp. Hist. Nat., 1878, p. 222 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 145 (Porto Rico, specimens).—Cory, Auk, 1886, p. 349 (Porto Rico); Cat. West Indian Birds, 1892, pp. 106, 132 (Porto Rico).

Anthracothorax viridis, Ridgway, U. S. Nat. Mus. Bull. 50, 1911, Pt. 5, p. 472 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 72-73 (Porto Rico).—Struthers, Auk, 1923, p. 475 (Mayagüez and coastal region).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 95 (Cartagena Lagoon).

Porto Rico; resident, common in the interior hills and mountains.

The green mango is confined to Porto Rico, where it occurs mainly

²⁰ The description is based on a bird taken by Maugé, which must have come from Porto Rico.

inland in coffee plantations and forests, living either in the densest growth or at the borders of the woods. During my personal field work in 1911-1912 it was found at Río Piedras, December 16 to January 4 (male taken December 18); Mameyes, February 9; Mayagüez, June 6; Maricao, May 29 to June 5 (specimen, June 1); Lares, June 18 to July 1 (specimens June 28 and 29); Utuado, August 3 to 9 (specimens August 6 and 8); Adjuntas, August 10 to 16 (specimens August 13 and 14); Aibonito, January 26 to February 5 (specimens January 26 and 29 and February 3); Cayey, January 15 to 25 (specimens January 16, 18 and 23), and Caguas, January 5 to 14. There is one skin in the U. S. National Museum from Mayagüez taken on June 16, 1901, by B. S. Bowdish. The bird was common in the higher hills from Maricao and Lares to Aibonito, but was found in moderate numbers elsewhere. On the coast it was noted only once, near Mameyes, though a few were seen at Río Piedras. In dry areas it was entirely absent, none being observed along the semi-arid south side of the island, nor in the region between Aguadilla and Camuy.

The species is characterized by large size (length, four and one-half inches) and a plumage of shining green, with steel-blue tail, faintly tipped with white, black bill and blackish primaries. Male, female and young are alike in color. Even a nestling, a male, barely fledged, taken by Dr. Richmond at Adjuntas, April 14, 1900, has the plumage as in the adult.

These birds were active, pugnacious and alert, and pursued one another or other hummers about flowering plants or through the aisles of the forest with dash and vigor, the light reflecting from their brilliantly metallic plumage as they flew rapidly about. When the shrubbery was wet, I noted that they remained inactive until the sun was high in the sky.

The emajagua hedges (*Paritium tiliaceum*), with their large yellow flowers, were favorite hunting grounds for these birds, as were the flowers of various trumpet creepers (*Ipomea*). They were observed many times working over the trunks and large limbs of trees, apparently gleaning small insects from the crevices of the bark, and when little clouds of gnats were gathered high in the air above the tree tops, these large hummers poised with rapidly vibrating wings, changing to one side or the other, or whirling completely around with the greatest celerity while picking up the minute insects. When tired, they came down to shaded perches, rested for a short time and then flew up again to continue their feeding. Peons working in the tobacco fields at Caguas accused them of

eating tobacco seed, but this hardly seems probable, as from stomach examinations I found that their food is entirely animal.

Their usual call is a sharp squeak, but at times I heard them utter series of low twittering notes that might be called a song.

Gundlach reports fresh eggs in October. Personally I noted them gathering nesting material in December and February, and on February 3 saw one settle on a nest forty feet from the ground in a tall, slender tree in a coffee plantation. The bird was busy arranging the lining in her home and I assumed that no eggs had yet been laid.

The food consists of small Homoptera, flies and spiders, and it is my opinion that though the birds feed at flowers, they are attracted more by the small insects that gather there than by the nectar of the blossoms. These birds seem to form the indigestible, chitinous covering of their animal food into pellets, which are ejected from the mouth after the nutriment has been extracted. Several of these, ready to be expelled, were found in stomachs that I examined, where they were compressed into a compact mass two millimeters long by one in width.

***Anthracothorax aurulentus* (Audebert and Vieillot)**

Porto Rican Mango, Doctor-Bird, Zumbador Dorado, Zumbador, Zumzum, Colibri

Trochilus aurulentus Audebert and Vieillot, Ois. Dor., 1801, Vol. I, pp. 29, 31, Pls. 12, 13. (Porto Rico.)

Trochilus margaritaceus, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 206 (listed).

Trochilus aurulentus, Moritz, Wieg. Arch. Naturg., 1836, p. 386 (listed).

Trochilus melanogaster, Bello, Zool. Gart., 1871, p. 350 (Porto Rico).—Hartlaub, Isis, 1847, p. 611 (listed).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 600 (Porto Rico, common).

Trochilus viridis var. *aurulentus*, Bello, Zool. Gart., 1871, p. 350 (listed).

Lampornis elliotti Cory, Auk, 1890, p. 374. (Immature, described as new from Anegada.)

Lampornis dominicus, Cory, Auk, 1886, p. 348 (Porto Rico, St. Thomas?); Cat. West Indian Birds, 1892, p. 106 (Porto Rico?).

Lampornis aurulentus, Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 377 (St. Thomas, specimens).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, p. 160; Anales Soc. Esp. Hist. Nat., 1878, p. 223 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 145 (Porto Rico, specimens).

Lampornis vernalis, Cory, Cat. West Indian Birds, 1892, p. 106 (Porto Rico, Anegada, St. Thomas?).—Bowditch, Auk, 1902, p. 366 (Porto Rico, habits).—Mortensen, Atlanten, 1909, Vol. VI, No. 66, p. 644 (St. Croix).

Lampornis dominica intermedia Simon, Hist. Nat. Troch., 1921, pp. 39, 274. (Described as a new form from Porto Rico.)

Lampornis dominica aurulenta, Simon, Hist. Nat. Troch., 1921, pp. 40, 274 (Porto Rico, Virgin Islands, St. Thomas, Culebra, St. John, Anegada).

Lampornis viridis? Mortensen, Atlanten, 1909, Vol. VI, No. 66, p. 644 (St Croix).

Anthracothorax aurulentus, Ridgway, U. S. Nat. Mus. Bull. 50, 1911, Pt. 5, p. 471 (Porto Rico, Culebra, St. Thomas, St. John, Anegada).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 73-74 (Porto Rico, Vieques, Culebra); Auk, 1916, p. 415 (Vieques); Auk, 1917, p. 60 (Culebra).—Cory Field Mus. Nat. Hist., Zoöl. Ser., 1918, Vol. XIII, Pt. 2, No. 1, pp. 224-225 (Porto Rico, Anegada, St. Thomas, specimens).—Struthers, Auk, 1923, p. 475 (Boquerón, Maricao).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 95-96 (Cartagena, Anegada, Guánica Lagoons, Boquerón, Mayagüez).

Porto Rico, Vieques, Culebra, St. Thomas, St. John, Anegada; resident.

In Porto Rico the species is common in open localities. During my field work I recorded it from Quebradillas, July 2 to 6 (specimen); Manatí, July 7 to 11 (specimen); Bayamón, July 20 to 25 (specimen); Martín Peña, January 2 (specimen); Mameyes, February 9 to 29 (specimens); Humacao, September 3 to 9; Patillas, May 12 to 14; Maunabo, May 11; Salinas, April 26 to May 2 (specimens); Juana Díaz, August 17 to 22 (specimens); Yauco, May 16 to 28; Guánica, May 20 (specimen); Cabo Rojo, August 24 to 31 (specimens); Aguadilla, June 9 to 12; Lares, June 25; Comerio, July 26 to 31; Ciales, July 12 to 18 (specimens); Aibonito, January 26 and 31 (specimen); and Cayey, January 15 to 25. There are specimens in the U. S. National Museum from Añasco, January 21, 1899; Hucares, February 13, 1899; Arroyo, April 2, 1899; and Cataño, February 13, 1900. Struthers found the birds at Boquerón and Maricao.

This is the common hummer of the coast region and, though a few are found in the mountains, as near Cayey and Aibonito, they are not common in high altitudes, and are seldom or never seen in dense forests. They are thus complementary in ecological association to *A. viridis*. The large flowers of the emajagua (*Paritium tiliaceum*), which grew in hedges through the pastures, attracted them, and they spent much time in trees in gleaning over the bark, searching the trunks and twigs for food. One taken in a grape-fruit grove near Manatí had the throat filled with ants. The birds were active and pugnacious and were continually chasing one another, or even driving away the honey-creepers that were feeding in the same locality. In some places they fed at the same plants as *A. viridis*.

Bowdish reports a nest containing two half-grown young near Aguedilla, July 21, 1900, placed on a small limb ten feet from the ground. I shot breeding birds at Salinas, April 30, and at Cabo Rojo, August 27. A fully grown young bird was taken at Ciales, July 13, and at Cabo Rojo grown young were common at the end of August. It is probable that the majority nest in May and June. They utter sharp chipping notes, and Bowdish reports hearing them give a trilling song.

On Vieques Island the present species was the most abundant hummer from March 16 to April 3, 1912, and, in view of this fact, it is strange that it was not reported previous to my visit. The flowers of the molinillo (*Leonotis*) were attractive to it, though this plant seemed to be seldom visited by other hummers. Specimens were taken on March 18 and 19. Young at this season were fully grown.

On Culebra Island the first specimen of this hummer was taken February 11, 1899, by J. D. Milligan. From April 5 to 21, 1912, I found them far from common, but secured specimens on April 6, 10 and 19. The few seen were found in brush-grown pastures. A male taken on April 10 had the sexual organs enlarged, indicating approach of the breeding season.

Swift forwarded skins from St. Thomas to Cassin, and there are four old skins from this island in the U. S. National Museum received from Swift and Akhurst. A female (U. S. N. M. 81038) was taken on St. John by F. A. Ober. Cory had four specimens from Anegada, and in 1890 gave these a new name under the impression that they were different from skins from Porto Rico, in which, however, he was mistaken. The bird has not been recorded from St. Croix; Mortensen's note of it must refer to the other islands.

The different plumages of this hummer have caused considerable confusion. The adult male has the back, throat and sides green, the breast black with a bluish sheen, the abdomen and under tail-coverts grayish brown and the tibia white. In the immature male there is a large irregular spot of green in the center of the throat, an indication of black on the breast, and the rest of the underparts are mingled gray and white. Adult and immature females are plain grayish white below. The females have been mistaken by many for the female of *viridis*, which, however, is green like the male.

Simon has indicated *A. aurulentus* as a subspecies of *A. dominicus* of the adjacent island of Haiti. Females in the two are closely similar except that the Haitian bird is decidedly larger, while males of *dominicus*, in addition to being larger, are more extensively black below. The

differences are so decided that there is no reason for not considering *dominicus* and *aurulentus* as distinct species. Simon further has named a form from Porto Rico as "*Lampornis dominica intermedia*," which, however, refers only to highly colored males and must be considered a synonym of *aurulentus*.

This hummer feeds mainly on Homoptera, Diptera and Hymenoptera of small or minute size, and occasionally on beetles and spiders.

Order CORACIIFORMES

Suborder ALCEDINES

Superfamily ALCEDINIDES

Family ALCEDINIDAE

Subfamily CERYLINAE

***Streptoceryle alcyon alcyon* (Linnaeus)**

Belted Kingfisher, Martin Pescador, Pájaro del Rey, Pitirre de Mangle, Matraca, Fraile Miguelete

Alcedo alcyon Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 115. (North America.)

Kingfisher, Knox, Hist. Acc. St. Thomas, W. I., 1852, p. 221 (St. Thomas).

Belted Kingfisher, Danforth, Oölogist, 1922, pp. 10, 177 (western Porto Rico).

Alcedo alcyon, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto Ricco, 1810, Vol. II, p. 206 (listed).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 255 (Porto Rico).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 600 (Porto Rico, specimens).

Ceryle alcyon, Newton, Ibis, 1859, p. 67 (St. Croix).—Bello, Zool. Gart., 1871, p. 349 (Porto Rico).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 180; Anales Soc. Esp. Hist. Nat., 1878, p. 218 (Porto Rico; specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 60-61, 145 (Porto Rico; specimens); Ornith., 1887, p. 452 (Porto Rico).—Cory, Cat. West Indian Birds, 1892, p. 103 (Mona, Porto Rico, St. Croix).—Bowditch, Oölogist, 1900, p. 72 (Vieques; specimens); Auk, 1902, p. 365 (Porto Rico; specimen).—Mortensen, Atlanten, 1909, Vol. VI, No. 66, pp. 646-647 (St. Croix).

Ceryle alcyon alcyon, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 66-67 (Porto Rico, Culebra; specimens); Auk, 1916, pp. 413-414 (Vieques; specimen); Auk, 1917, pp. 55, 59 (Culebra, Culebrita).—Struthers, Auk, 1923, p. 475 (Mona, Porto Rico).

Streptoceryle alcyon, Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 92 (western Porto Rico).

Mona, Porto Rico, Vieques, Culebra, Culebrita, St. Thomas, St. Croix: winter visitant.

The kingfisher is a common winter resident in the vicinity of the coast, where it is found at the borders of lagoons and bays and along the lower courses of the large rivers. I observed it at Río Piedras, December 19 and 22, 1911; Mameyes, February 9 to 29, 1912 (specimens taken February 10 and 24); and near Caguas, January 10. The species is of somewhat casual occurrence inland, as my only record was along the Río Caguitos near Caguas, as just stated. Dr. Richmond reported a bird seen by Dr. Stejneger between Utuado and Adjuntas, April 3, 1900, and recorded the kingfisher near Arecibo, April 12. Apparently the bird at times follows the larger streams back among the hills.

Struthers reports that the kingfisher arrived in fall on September 23, 1921, and that he saw the last in spring on May 21, 1921. Danforth has noted them from October 14, 1921, to April 11, 1922. Bowdish found one at Aguadilla, October 7, 1900. All of these records pertain to western Porto Rico. Mr. F. A. Potts writes me that near the Central Aguirre he has seen them from October 5 to April 14.

In my own experience the birds occurred singly and were wild and difficult to approach. They were found most frequently at the border of mangrove swamps.

Cory has reported the kingfisher on Mona, and Struthers noted two seen there on July 16, 1921, an unusually early date.

On Vieques Bowdish reports them on December 10 and 12, 1899. I saw them there occasionally from March 16 to April 3, 1912, and shot a male on March 30. They were noted in scattered trees along the beach and about partly dry lagoons. On Culebra Island I saw kingfishers occasionally from April 5 to 21, 1912, along bays and lagoons, and at times in the mangrove swamps. I noted one on Culebrita Island, April 15, and Señor Guillermo Morris, lighthouse-keeper there, informed me that he saw them now and then through the summer. From St. Thomas the kingfisher has been reported by Knox and Cassin. In the U. S. National Museum there are two skins from this island, one taken by Robert Swift and the other by F. A. Ober. The Newtons record the kingfisher as a winter visitant on St. Croix, leaving late in April.

Superfamily TODI

Family TODIDAE

Todus mexicanus Lesson

Porto Rican Tody, San Pedrito, Medio Peso, Papagayo, Barrancolino, Verdadon

Todus mexicanus Lesson, Ann. Sci. Nat., 2nd ser., 1838, Vol. IX, p. 167 (Vera Cruz and Tampico, Mexico=Porto Rico.)

- Todier, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 39 (St. Thomas?).
- Porto Rican Tody, Danforth, Oölogist, 1922, p. 10 (Porto Rico); Bird-Lore, 1922, p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).
- Todus viridis*, Moritz, Wieg. Arch. Naturg., 1836, p. 378 (Porto Rico).—Bello, Zool. Gart., 1871, p. 349 (listed).
- Todus portoricensis* Lesson, Ann. Sci. Nat., 2nd ser., 1838, Vol. IX, p. 167. (Porto Rico).—Hartlaub, Isis, 1847, p. 611 (listed).
- Todus hypochondriacus* Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 250. (Described from Porto Rico).—Sundevall, Öfvers. Kongl. Vetensk.—Akad. Förh., 1869, p. 598 (Porto Rico).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 180; Anales Soc. Esp. Hist. Nat., 1878, p. 219 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 145 (Porto Rico).—Cory, Auk, 1886, p. 371 (Porto Rico); Cat. West Indian Birds, 1892, pp. 103, 132 (Porto Rico).—Bowditch, Auk, 1902, p. 364 (Porto Rico).—Hartert, Nov. Zool., 1902, Vol. IX, p. 279 (Ponce).
- Todus mexicanus*, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 64-66 (Porto Rico).—Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 449 (Porto Rico).—Struthers, Auk, 1923, p. 474 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 91-92 (Porto Rico, habits).

Porto Rico; common through the interior of the island and found in small numbers on the coastal plain where there is suitable cover.

In 1911 and 1912 I recorded the tody (Pl. LXIII) from Quebradillas, July 2 to 6 (specimens); Manatí, July 7 to 11; Bayamón, July 20 to 25; Toa Alta, August 2; Río Piedras, December 16, 1911, to January 4, 1912 (specimen); Mameyes, February 9 to 29 (specimen); Yabucoa, May 10 (specimen); Maunabo, May 11 (specimen); Salinas, April 26 to May 2 (specimen); Juana Diaz, August 17 to 22 (specimens); Yauco, May 16 to 28 (specimens); Guánica, May 20 (specimen); Cabo Rojo, August 24 to 31; Mayagüez, June 6; Aguadilla, June 9 to 10; Maricao, May 29 to June 5 (specimens); Adjuntas, August 10 to 16 (specimens); Ciales, July 12 to 18 (specimens); Comerio, July 26 to 31 (specimen); Aibonito, January 26 to February 5 (specimens); Caguas, January 5 to 14 (specimens), and Hacienda Catalina, March 2 to 11 (specimens).

If there be gnomes and elves in our world of birds, among them are the tiny todies, whose long, spadelike bills, light eyes, brilliant plumage and peculiar mannerisms make them the dwarfs and hobgoblins of the West Indian forests. Though brilliantly colored, they are inconspicuous for their green backs blend with the perennial green of the leaves amid which they are found, and even the brilliant red of the throat may be mistaken for some highly colored berry. Their acquaintance is one of the greatest pleasures that comes to a foreign ornithologist traveling in their haunts.

The Porto Rican tody frequents dense forest, either primitive or second growth, or the brush-covered banks of streams. It is not restricted to the luxuriant growth of regions of heavy rainfall, being common also in some localities on the arid southern side of the island, where it inhabits areas of open scrub along dry washes in the low hills. The species is one of the few birds that I found in any number in the gloomy, dripping rain-forest that clothes the higher slopes of the great mountain El Yunque. Mangrove swamps are not attractive to these birds, and in general todies are in greatest abundance in the hills and uplands above the level coastal plain.

The tody sits quietly on some low twig, resting with bill pointing up at an angle of forty-five degrees, but it is an active flycatcher, as it flies out to capture insects with a loud snap of the bill, or flutters about the tips of twigs to pick its prey from the underside of leaves. The birds are trustful and have little fear. In fact, during a sudden down-pour of rain, I have had them come confidently to share with me the shelter of the broad leaves of a banana plant, when they rested at ease almost within reach of my hand. As they are so small and remain often quiet on their perches, it frequently happens that comparatively few are seen, and it is only on a warm morning following a day or night of fog and rain that they come into the more open trees above the brush, and one gains a true idea of their numbers.

The ordinary note of the tody is a harsh *pre* or *pre-ah*, a sound uttered in a loud tone, entirely out of proportion to the size of the bird. In calling, it raises itself to the full length of its legs, points the bill up as the note is given, and then sinks back to its normal attitude. At irregular intervals the todies fly out with a loud whirring rattle of the wings—a sound that apparently is made by the attenuate outer primary and is under the control of the bird, for in normal flight it is not heard. This strange rattle is made by both sexes mainly during the breeding season, from January to June.

One does not appreciate fully the systematic position of the tody, not far from the kingfisher family, until one comes to consideration of its nesting. Todies in Porto Rico are said to begin breeding the first week in March, and birds taken then showed earth stains on the plumage. The eggs, however, do not appear to be deposited until May or June, and I found young birds, recently from the nest, common in July. I saw my first nest of this species near Yauco on May 24. A tody flew out from the face of a cut bank in a dry pasture, and on examination the entrance of a nest tunnel was found, a hole about one and one-quarter

inches in diameter, showing the double path of an occupied home. The tunnel went straight in through the hard earth for ten inches, and then turned at a right angle to go eight inches farther to the terminal chamber, a cavity three inches high, three inches wide and five inches deep. This nest contained three eggs, as large as the end of my little finger, laid on the bare earth. Their size was astonishing, considering the smallness of the bird. Each egg was worked into a little hollow in the loose earth, so that it was partly imbedded, but even then it must have been a task for the female to cover her treasures. In color the eggs were a beautiful transparent white, showing a rosy reflection before blowing, and dull white with a slight gloss afterwards. They are decidedly pointed, with slight difference between the poles, and swollen centrally. They measure 15.9 x 13.3 mm., 15.6 x 13.3 mm., and 15.8 x 13.3 mm., respectively. Another nest, found near Maricao, June 3, in a clay bank, had the entrance hole an inch and a quarter in diameter and eight inches in depth, and beyond was a circular chamber three inches across. This nest contained two eggs, so stained by red clay that they appeared to be densely spotted. Young out of the nest were first seen near Quebradillas, July 5, and from then on were common. They differ from adults in the color of the throat, which at first is grayish white, like the breast. Red feathers soon appear in a line on either side and rapidly replace the lighter color, until soon the young resemble the adults, except that the bill is shorter.

The color of the iris in the tody is grayish white or plain slate, a difference correlated perhaps with sex—a point that I neglected to verify.

The food of the tody is made up largely of flies, beetles, small Homoptera (mainly lantern-flies), earwigs and moths—all of minute size, as would be expected in so small a bird. Occasionally I found that one had eaten a tiny lizard, and we may imagine a strenuous battle between the diminutive bird and an active anolis before the latter could be swallowed. It may be added that all food taken was finely broken, so that detailed examination of the stomachs of these birds, always packed with insects of from fifteen to twenty or more species, was a slow and tedious process.

Order PICIFORMES

Suborder PICI

Family PICIDÆ

Subfamily PICINÆ

Melanerpes portoricensis (Daudin)

Porto Rican Woodpecker, Carpintero

Picus portoricensis Daudin., Ann. Mus. Hist. Nat., 1803, Vol. II, p. 286, Pl. 51.
(Porto Rico.)

Woodpecker?, Newton, Ibis, 1859, p. 150 (St. Croix; reported?).

Porto Rican Woodpecker, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).

Picus torquatus, Moritz, Wiegmann Arch. Naturg., 1836, p. 378 (Porto Rico).

Picus portoricensis, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto Rico, 1810, Vol. II, pp. 200, 258-259 (Porto Rico).—Hartlaub, Isis, 1847, p. 611 (listed).—Sundevall, Öfvers. Kongl. Vetensk. Akad. Förh., 1869, p. 599 (Porto Rico; specimens).—Bello, Zool. Gart., 1871, p. 350 (listed).

Centurus portoricensis, Cory, Auk, 1902, p. 229 (Porto Rico; specimens).

Melanerpes portoricensis, Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 377 (St. Thomas; specimens).—Taylor, Ibis, 1864, p. 170 (Porto Rico).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 256 (Porto Rico; specimens).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 183; Anales Soc. Esp. Hist. Nat., 1878, p. 227 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 147 (Porto Rico, specimens).—Cory, Auk, 1886, p. 377 (Porto Rico, St. Thomas).—Cory, Cat. West Indian Birds, 1892, pp. 104, 132 (Porto Rico, St. Thomas).—Bowditch, Oölogist, 1900, pp. 72-73 (Vieques); Auk, 1902, p. 365 (Porto Rico, Vieques).—Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 47 (Porto Rico, Vieques, and St. Thomas).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 62-64 (Porto Rico, Vieques); Auk, 1916, p. 413 (Vieques; specimens); Auk, 1917, p. 54 (Vieques); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 320 (bones from cave deposits, Morovís).—Struthers, Auk, 1923, p. 474 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 92-93 (Porto Rico, habits).

Porto Rico and Vieques; common: St. Thomas?

In Porto Rico, in 1911 and 1912, I found the carpintero near Quebradillas, July 2 to 6 (specimen, July 5); Manatí, July 7 to 11; Bayamón, July 20 to 25; Río Piedras, December 16, 1911, to January 4; Mameyes, February 9 to 29 (4 skins); Maunabo, May 11 (specimen); Salinas, April 26 to May 2; Juana Diaz, August 17 to 22; Yauco, May 16 to 28 (2 specimens); Cabo Rojo, August 24 to 31; Mayagüez, June 6; Aguadilla, June 9 to 12; Maricao, May 29 to June 5 (5 skins); Lares, June to July 1 (2 specimens); Utuado, August 3 to 9 (speci-

men); Adjuntas, August 10 to 16 (4 specimens); Ciales, July 12 to 18 (specimen); Comerio, July 26 to 31; Aibonito, January 26 to February 5 (5 skins); Caguas, January 5 to 14 (4 specimens); Cayey, January 18 and 24 (specimen); Hacienda Catalina, March 2 to 11 (specimen).

This species is represented in the U. S. National Museum by additional skins, as follows: A series of 10 from Mayagüez, taken by B. S. Bowdish, May 27 to July 21, 1901; 2 from Hucares, secured February 15, 1899, by A. B. Baker and Marsh; 4 from Cataño, taken March 12, April 8 and 22, 1900, by Bowdish; 1 from Lares, January 26, 1899, by A. B. Baker; 2 from Utuado, April 8 and 10, 1900, by C. W. Richmond; 1 from Adjuntas, April 14, 1900, by C. W. Richmond; 5 from Caguas, January 8, 9 and 11, 1899, by A. B. Baker and J. D. Milligan; and 1 from Hacienda Catalina, March 2, 1900, by C. W. Richmond. I found numerous remains of the woodpecker among bones from caves near Morovís (collected by H. E. Anthony).

The records that have been given show that the woodpecker has a wide range through the island of Porto Rico. It is confined to wooded sections, but has fared better than many of its avian companions in the utilization of land by the Caucasian, since when its original forest haunts were destroyed, it found a congenial home in the trees grown to furnish shade for coffee plantations. In the coastal region it is comparatively rare, because there is little suitable cover, but on the slopes of the inland hills there are broad areas through which it is common. I saw one or two woodpeckers among trees in the town of Río Piedras, a few through the dry hills below Yauco, in pasture groves near Cabo Rojo, or in the coconut plantations near Mameyes, but they were most abundant farther inland. In habits the Porto Rican woodpecker strongly resembles the red-headed woodpecker or the ant-eating woodpeckers of the United States, and has many of the mannerisms of those birds. The flight is powerful and undulating, like that of most other woodpeckers, and while the birds are not wild, they may be difficult to approach if they notice that they are being followed. They may scold vigorously, but take care to keep concealed on the opposite side of a tree.

This is one of the few species that is common in the coffee plantations, as most of the native birds do not frequent them much. The woodpeckers seemed to feed entirely by searching the trunks of trees, for though I saw them frequently resting on commanding stubs in the sun, they appeared to make no attempt to capture passing insects on the wing, as is the custom with many related woodpeckers.

In Mameyes complaint was made that they damaged coconut trees by drilling nesting holes in them, in which, as time went on, water

accumulated and rotted the wood, until finally the tree broke at the point of decay. As it requires five or six years for a coconut tree to come into bearing, the loss of a tree is appreciable. Such destructiveness is, however, local, and is easily corrected by killing the birds concerned. Elsewhere the woodpecker is decidedly beneficial and should be protected.

On Vieques Island the woodpecker was reported by Bowdish in 1900, and I found it common from March 16 to April 3, 1912, in regions of forest. At this season all the birds were nesting. On March 25 I saw one feeding nearly grown young in a hole in a dead stub twenty feet from the ground. One secured by Bowdish, December 17, 1899, one taken by Richmond, March 27, 1900, and six that I prepared personally appear identical in color and measurement with birds from Porto Rico.

The Newtons report a woodpecker questionably from St. Croix. Cassin states that Robert Swift forwarded several specimens from St. Thomas, but no other naturalist has found them there. Since Swift collected extensively on Porto Rico and was not careful in marking his skins, the St. Thomas records are open to serious doubt.

The woodpecker has the upper surface, including the wings, glossy black; forehead, lores and rump, white; and undersurface suffused with red. In males the throat is red, often with black extending across below it, and in females it is smoky brown, like the flanks. The tips of the secondaries are usually edged with white in females and occasionally so in males. Young, when they leave the nest, are similar to adults, except that the red below is less extensive.

From examination of stomachs I found that two-thirds of the food of this bird is made up of insects, largely wood-boring larvæ, ants and earwigs. Occasionally one had eaten a little frog or a small lizard. Seeds and small fruits were eaten freely, particularly figs and various berries.

***Sphyrapicus varius varius* (Linnaeus)**

Yellow-bellied Woodpecker

Picus varius Linnaeus, Syst. Nat., ed. 12, 1766, Vol. I, p. 176. (Carolina.)

Picus varius, Newton, Ibis, 1860, p. 308 (St. Croix, specimen).

Sphyrapicus varius, Cory, Cat. West Indian Birds, 1892, p. 104 (St. Croix).

Sphyrapicus varius varius, Ridgway, U. S. Nat. Mus. Bull. 50, 1914, Pt. 6, p. 276 (St. Croix).

St. Croix; casual in migration.

The only record is that of one procured by Professor Reinhardt, and reported by the Newtons in 1860. The species goes with some regularity

to the Bahamas and Cuba, but is merely a straggler on St. Croix. It has been assumed that this individual was of the eastern subspecies.

Order PASSERIFORMES

Suborder TYRANNI

Family TYRANNIDAE

Tyrannus dominicensis dominicensis (Gmelin)

Gray Kingbird, Pitirre, Chicheri

Lanius dominicensis Gmelin, Syst. Nat., 1788, Vol. I, Pt. 1, p. 302. (Santo Domingo.)

Gray Kingbird, Danforth, Oölogist, 1922, p. 11 (Porto Rico); Bird-Lore, 1922, p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Tyrannus pipiri, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 202, 266-267 (listed).

Muscicapa tyrannus, Moritz, Wieg. Arch. Naturg., 1836, p. 387 (Porto Rico).

Tyrannus griseus, Taylor, Ibis, 1864, p. 169 (Porto Rico, very common).

Melittarchus griseus, Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 170 (Porto Rico); Anales Soc. Esp. Hist. Nat., 1878, p. 192 (abundant).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 140-141 (Porto Rico, specimens).

Tyrannus rostratus, Nicoll, Ibis, 1904, p. 575 (St. Croix).

Tyrannus dominicensis, Newton, Ibis, 1859, pp. 146-147 (St. Croix).—Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 375 (St. Thomas, specimens).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 249 (Porto Rico, specimens).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 599 (Porto Rico).—Bello, Zool. Gart., 1871, p. 349 (Porto Rico).—Ridgway, Proc. U. S. Nat. Mus., 1884, p. 172 (St. Thomas, specimens).—Cory, Auk, 1890, pp. 373, 375 (St. Thomas, Tortola, Virgin Gorda, specimens); Auk, 1891, p. 48 (St. Croix, specimen); Cat. West Indian Birds, 1892, p. 108 (Mona, Porto Rico, St. Thomas, Tortola, Virgin Gorda, Anegada, St. Croix).—Bowditch, Oölogist, 1900, p. 73 (Vieques); Auk, 1903, p. 10 (Porto Rico, habits).—Wetmore, Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 324 (bones from caves, Morovís).—Mortensen, Atlanten, 1909, Vol. VI, No. 66, pp. 641-642, Fig. 304 (St. Croix).

Tyrannus dominicensis dominicensis, Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 708 (Mona, Porto Rico, St. Thomas, St. John, Tortola, Virgin Gorda, Anegada, St. Croix).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 75-78, pl. 7 (Porto Rico, habits, food); Auk, 1916, p. 415 (Vieques); Auk, 1917, pp. 55, 60 (Culebra, Louis Peña, Culebrita).—Struthers, Auk, 1923, p. 475 (Porto Rico, Mona, specimens).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 96-97.

Mona, Porto Rico, Vieques, Culebra, Louis Peña, St. Croix, St. Thomas, St. John, Tortola, Virgin Gorda, Anegada; so far as known, resident and breeding throughout this range.

Cory has recorded the gray kingbird (Pl. LXIV) from Mona, supposedly on basis of specimens received from W. W. Brown, Jr., in 1892. There are in the U. S. National Museum three skins taken there by Bowdish (who found the bird common August 9 to 21, 1901), one on August 11 and two on August 16, and Struthers reports a pair shot on July 16, 1923.

In Porto Rico the gray kingbird is one of the conspicuous resident birds. Taylor, in 1864, remarked upon its abundance, and it has found modern changes through cultivation favorable, so that it has maintained its numbers.

During my field work I recorded it as follows: Quebradillas, July 2 to 6; Manatí, July 7 to 11; Bayamón, July 20 to 25; Río Piedras, December 16, 1911, to January 4, 1912; Mameyes, February 9 to 29; Humacao, September 3 to 9; Yabucoa, May 3 to 10; Maunabo, May 11; Patillas, May 11 to 13; Salinas, April 26 to May 2; Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Mayagüez, June 6; Añasco, June 7 to 9; Aguadilla, June 9 to 12; Maricao, June 4; Lares, June 18 to July 1; Utuado, August 3 to 9; Adjuntas, August 10 to 16; Ciales, July 12 to 18; Comerio, July 26 to 31; Cayey, January 15 to 25; Aibonito, January 26 to February 5; Caguas, January 5 to 14; Hacienda Catalina, below El Yunque, March 2 to 11. Specimens were taken at most of the localities and there are in addition skins in the U. S. National Museum from Arecibo, San Juan and Cataño. The gray kingbird is a species of the open, being found through the pastures, cultivated fields and waste lands from the coast to the higher portions of the island, but it is not encountered in dense forest or in extensive coffee plantations. None were seen in the forests on El Yunque, though the bird was common in the clearings about its base, and only two were noted near Maricao, which is in the heart of the coffee district.

The native name of "pitirre" is given in imitation of the call-note, which is heard constantly when the birds are near, and which at times is lengthened and softened until it might almost be called a song. The flight is direct, moderately fast and accomplished by rapidly beating wings. At nightfall these kingbirds gather in small parties along streams, to roost in bamboos or in the mangroves surrounding lagoons. In several places they were noted coming in the evening to roost in trees of plazas. The first of these gatherings was observed in Caguas, where kingbirds roosted at night in the flame trees. In Adjuntas, as it grew dusk, considerable numbers came flying in to the plaza, singly or in little groups of four or five. At first they alighted in the tops of rather high, open trees, and from here made sallies after passing insects,

abundant in the early twilight, or flew swiftly and rather erratically about, swooping and diving, apparently merely in pleasure. They were rather silent, calling only occasionally, and as it grew darker all went down into low, dense trees to roost.

At times, when drawn to some area by an abundance of food, this species is almost gregarious. On several occasions five or six individuals were observed flycatching about high breezy points in the mountains and, when they were satisfied, perching together on a dead stub, all facing the wind. Trees loaded with various fruits, as the guaraguou (*Trichilia spondiodes*) or wild fig (*Ficus*), drew large numbers. On March 6, along the Río Mameyes, at the base of El Yunque, dozens had gathered to feed on the fruit of the guaraguou and, when gorged, congregated in parties in tops of dead trees to await the process of digestion. Seventeen were counted within ten feet of one another in one small tree. The laurel berries (*Phoebe elongata*) are so large that the birds can scarcely swallow them; nevertheless they gulp down all they possibly can hold. In feeding on the wild fig, where the fruit grows on slender twigs, the kingbird flies out and pulls it off, returning to a perch on the larger limbs to swallow it. Quantities of the berries of the balsamo (*Palicourea crocea*) and camacey (*Miconia racemosa*) are taken also. During August the young birds rely largely upon vegetable food, which is easily obtained.

As regards the insect food of this species, a few facts worthy of note were gained by observation in the field. On two occasions birds were noted eating the caterpillars of a large sphinx moth. These were beaten on a limb and the juices were then extracted by working the body through the bill, while the skin was discarded. At Caguas, in the tobacco fields, while their services in eating these and other caterpillars were recognized, it was said that these kingbirds did a small amount of damage by breaking the leaves of the tobacco plants, either with bill or wing, when flying down to pick off the caterpillars. One bird near Mameyes was seen flying out after a yellow butterfly, but missed it, and another was observed eating a large bee. In Mayagüez a few of these birds were seen flycatching above the hot, paved streets and perching on wires and housetops.

The nesting season appears to extend from April to August, as specimens taken during this period had the sexual organs enlarged. Bowdish records a nest ten feet from the ground on the horizontal limb of a mango tree near Aguadilla, which on June 9, 1900, furnished three slightly incubated eggs. One set of fresh eggs and two with incubation begun were taken here on July 9. He found the usual set to consist

of three eggs and secured fresh eggs from June 20 to July 22. The nests are cupped structures of fair size, composed of fine rootlets, creepers and twigs, lined with rootlets. Danforth also reports three eggs as the usual number in a set.

On Vieques Island the gray kingbird is a common resident in brush-grown pastures. Several specimens were taken in the course of my work, from March 16 to April 3, 1912.

On Culebra Island the species was likewise common, and spread even to Louis Peña and Culebrita. Dozens of the birds roosted in mangroves about Flamenco Lagoon, where they proved the truth of the common statement of the country people, that the gray kingbird is the earliest riser among the birds. At the first indication of coming dawn, one or two circled in the air, calling, while others answered from the branches below. For the next hour or more the birds called incessantly, and then began to spread into the hills and pastures for the usual routine of search for food that occupied the day. By April 10 they were in pairs and on April 13 I saw one carrying nesting material. Several specimens were collected.

On St. Croix the Newtons reported the gray kingbird as the most common and conspicuous bird. They found it nesting from the end of May to the first week in August, and recorded three eggs as the usual set. M. J. Nicoll found it still one of the commonest birds in 1904. Mortensen, in 1909, remarks on its abundance and notes that it is called *chicheri*. There are six specimens in the Museum of Comparative Zoölogy, taken June 19 and September 15, 1914, by G. K. Noble.

The species is also common on St. Thomas, where Robert Swift collected it as early as 1860 or earlier. Benedict and Nye forwarded a series of seven, taken January 17 to 24, 1884, to the U. S. National Museum. Cory reports it from Tortola and Virgin Gorda. There is a female in the U. S. National Museum collected on Anegada, December 23, 1889, by C. S. Winch, and another secured by F. A. Ober on St. John.

The gray kingbird is well named, since it is gray above, with dusky wings and tail, a dusky line through the eye, and grayish white below. There is a concealed patch of orange in the crown that is seldom seen except when the bird is in the hand.

The familiar scientific name for this species, *dominicensis*, should be replaced, according to Stresemann,²¹ by *curvirostris* of Hermann (*Sitta curvirostris*, Tab. Aff. Anim., 1783, p. 204). In this, however, he is in error since this name is based on "another sort of Loggerhead" in Hans

²¹ Nov. Zool., 1920, Vol. XXVII, p. 329.

Sloane's Voyage (Vol. 2, 1725, p. 301, pl. 259), which, in my opinion, can not be identified certainly from either description or figure.

From examination of a large number of stomachs, I found that three-fourths of the food was animal and one-fourth vegetable. The bird is entirely beneficial and destroys such large numbers of weevils injurious to sugar cane, as well as other noxious insects, that it should be encouraged everywhere through the cultivated fields. Those who raise bees complain that the pitirre does considerable damage by capturing queen bees during their nuptial flights, as they are large and comparatively slow-flying and so are easily picked out from the smaller, faster-moving workers and drones, and it may be necessary to kill kingbirds about apiaries when they become too numerous. This complaint should not, however, be made the basis of general destruction, for the bird is highly beneficial. Great swarms of bees about apiaries are attractive to the pitirre, but frequently I found that birds that were flycatching actively confined their captures to other insects even though the air was alive with bees.

Wild fruits, particularly those of the royal palm, espino (*Xanthoxylum*), wild figs, euphorbias and moral (*Cordia*) are eaten regularly, especially by immature birds in late summer.

[*Tyrannus tyrannus* (Linnaeus)]

Kingbird

Lanius tyrannus Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 94. (Carolina.)—Hartlaub, Isis, 1847, p. 611 (Porto Rico).

Tyrannus tyrannus, Cory, Auk, 1886, p. 245 (Porto Rico?); Cat. West Indian Birds, 1892, p. 108 (Porto Rico).

The kingbird has been mentioned from Porto Rico by Hartlaub and Cory, but there is no known definite record of its occurrence.]

Tolmarchus taylori (Sclater)

Porto Rican Petchary, Clérigo

Pitangus taylori Sclater, Ibis, 1864, p. 169. (Porto Rico.)

Porto Rican Petchary, Danforth, Oölogist, 1922, p. 10 (Porto Rico); Bird-Lore, 1924, p. 41 (Mayagüez).

Pitangus taylori, Taylor, Ibis, 1864, p. 169 (Porto Rico).—Cory, Auk, 1886, p. 232 (Porto Rico); Cat. West Indian Birds, 1892, pp. 108, 132 (Porto Rico).—Bowditch, Oölogist, 1900, p. 73 (Vieques); Auk, 1903, p. 10 (Porto Rico).

Tyrannus taylori, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 249 (Porto Rico, specimens).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 599 (Porto Rico, one).—Gundlach, Journ. für Ornith., 1874.

p. 311; Journ. für Ornith., 1878, pp. 159, 171; Anales Soc. Esp. Hist. Nat., 1878, p. 193 (Porto Rico, common).—Stahl, Faun, Puerto Rico, 1883, pp. 60, 141 (Porto Rico, specimens).

Tolmarchus taylori. Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 685 (Porto Rico, Vieques).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 78-80 (Porto Rico, Vieques); Auk, 1916, p. 415 (Vieques, specimens); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 324-325 (bones from caves near Morovís).—Struthers, Auk, 1923, p. 475 (Porto Rico, Mona).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 97-98 (Porto Rico, habits).

Tolmarchus caudifasciatus taylori, Hellmayr, Cat. Birds Americas, Pt. V, Field Mus. Nat. Hist., Zööl. Ser., Vol. XIII, April 11, 1927, p. 158 (Porto Rico, Vieques).

Porto Rico and Vieques Island, common resident; Mona Island, reported.

Mr. Struthers informs us that in 1921 he recorded ten birds of this species on Mona, a locality for which there has been no previous report. As the clérigo is not known to migrate, these must be considered resident birds.

In Porto Rico I found this flycatcher at Quebradillas, July 2 to 6; Manatí, July 7 to 11; Bayamón, July 20 to 25; Toa Alta, August 2; Río Piedras, December 16, 1911, to January 4, 1912; Mameyes, February 9 to 29; Yabucoa, May 3 to 10; Maunabo, May 11; Patillas, May 11 to 13; Salinas, April 26 to May 2; Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Aguadilla, June 9 to 12; Maricao, May 29 to June 5; Lares, June 18 to July 1; Utuado, August 3 to 9; Adjuntas, August 10 to 16; Ciales, July 12 to 18; Comerio, July 26 to 31; Aibonito, January 26 to February 5; Caguas, January 5 to 14; Cayey, January 15 to 25; Hacienda Catalina, below El Yunque, March 2 to 11. A series of skins was taken throughout this range. There are specimens in the U. S. National Museum from Hucares, Pueblo Viejo and Arecibo. The original home of this bird would appear to be in the forests which formerly covered the island; now it is common through the coffee plantations and in second-growth forest. In the lowlands it appears to be changing its habits, as it is spread out through the pastures and fields where there are mango trees or clumps of bamboo. It was seen in extensive mangrove swamps near Mameyes. In the older citrus groves, where there are good-sized trees, it is fairly common. In Río Piedras it was noted in trees growing in yards in the town.

The birds are quiet in their habits and usually perch where they are hidden by clumps of leaves. From these points they fly out after insects, sometimes for considerable distances. Shaded perches are

nearly always chosen, especially during the heat of the day. They are rather silent, the call-note being a loud *pi ti ti ty*, heard most often in the breeding season. Near Cayey, in January, one was seen bathing by darting down to the surface of a pool and then alighting and shaking its feathers. They are rather pugnacious, but not to such an extent as the gray kingbirds.

The breeding season appears to extend from February to June, and after July 1 young birds were common. I took a breeding female at Yabucoa, May 10, and secured young in juvenal dress at Lares on June 28 and at Comerio on July 29. In the dense forests of El Yunque the adults were nesting the first week in March and scolded the crows with harsh notes when the latter alighted above their nests. Bowdish reports nests containing three young each at Aguadilla, June 1 and 3, 1900.

Remains of this bird were common in cavern deposits near Morovís.

On Vieques Island the species was first reported by Bowdish in 1900. I found it fairly common from March 16 to April 3, 1912, and prepared several as specimens. A mated pair was observed on March 28 and a male taken the following day was breeding. Skins secured here are very slightly paler above than the average from Porto Rico, but are exactly like part of the Porto Rican series, so that the difference appears purely individual. The genus reaches its eastern limit on Vieques.

The food of the clérigo, like that of the gray kingbird, is composed three-fourths of animal and one-fourth of vegetable material. It eats fewer Hymenoptera and more weevils and Hemiptera than the other species mentioned, and also captures more of the little tree-toads (*Eleutherodactylus*), the difference being due to its choice of habitat amid trees. Berries of palms, wild figs and the espino (*Xanthoxylum*) are most abundantly represented among wild fruits in its food. Though the bird has been accused of eating honey-bees, I found no trace of them in stomachs that I examined minutely. The species seems wholly beneficial.

The clérigo is easily distinguished from the gray kingbird by its dusky brown back and blackish head. The under surface is grayish white and there is a concealed crown patch of bright yellow. The bird is between eight and nine inches in length.

Dr. Hellmayr (in the reference cited in synonymy above) has considered the six recognized forms of the genus *Tolmarchus* as related sub-specifically to one another. Though obviously of similar stock to me it appears that differentiation has proceeded to a point where the Porto Rican bird at least is specifically distinct from all others. It has its

nearest ally in *Tolmarchus gabbi* of the adjacent island of Hispaniola, from which it differs abruptly in larger size throughout, there being no intergradation in measurements.

***Myiarchus antillarum* (Bryant)**

Porto Rican Flycatcher, Antillean Flycatcher, Juí

Tyrannus antillarum, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 249. (Porto Rico.)

Myiarchus antillarum, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 599 (Porto Rico, specimen).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 171; Anales Soc. Esp. Hist. Nat., 1878, p. 194 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 141 (Porto Rico, specimens).—Cory, Auk, 1886, p. 238 (Porto Rico); Cat. West Indian Birds, 1892, pp. 108, 132 (Porto Rico).—Bowditch, Oölogist, 1900, p. 73 (Vieques); Auk, 1903, p. 11 (Porto Rico, Vieques).—Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 639 (Porto Rico, Vieques).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 81-82 (Porto Rico, Vieques); Auk, 1916, p. 415 (Vieques, specimens); Auk, 1917, p. 60 (Culebra, heard); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 325 (bones from cave at Morovís).—Struthers, Auk, 1923, p. 475 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 98 (Porto Rico, habits).

Myiarchus stolidus antillarum, Hellmayr, Cat. Birds Americas, Pt. V. Field Mus. Nat. Hist., Zool. Ser., Vol. XIII, April 11, 1927, p. 169 (Porto Rico, Vieques).

Porto Rico and Vieques; resident, fairly common. Culebra, of uncertain status.

On Porto Rico this flycatcher is fairly common, being evenly distributed but nowhere abundant. I found it at Quebradillas, July 2 to 6 (specimen); Manatí, July 7 to 11; Bayamón, July 25 (specimen); Toa Alta, August 2; Río Piedras, December 16, 1911, to January 4, 1912 (specimens); Mameyes, February 9 to 29 (specimens); Patillas, May 13 (specimen); Salinas, April 26 to May 2 (specimen); Juana Diaz, August 17 to 22; Yauco, May 16 to 28 (specimen); Cabo Rojo, August 24 to July 1 (specimen); Aguadilla, June 9 to 12; Lares, June 18 to July 1 (specimen); Utuado, August 3 to 9; Adjuntas, August 15; Ciales, July 12 to 18; Comerio, July 30; Aibonito, January 26 to February 5 (specimens); Caguas, January 5 to 14; Hacienda Catalina, below El Yunque, March 2 to 11. There are specimens in the U. S. National Museum from Mayagüez and Coamo. The juí is mainly an inhabitant of trees and is found in coffee plantations, small areas of second-growth forest, along hedgerows; brush-filled gullies or occasionally along the borders of cane-fields, where other cover is near. Near Bayamón it

was observed in citrus groves. On the mountain El Yunque it was found up to 1800 feet.

In habits these birds are quiet and unassuming and may easily escape notice. They usually choose an open perch, sometimes in a small opening in the forest, or again along the border of a coffee plantation, though they often perch in the dense leaves in the tops of the trees. Their food of insects is captured on the wing, the birds either returning to the original perch or to another near by. Their call is a plaintive *peer*, at times varied to *pee pee re*, uttered slowly. This, rendered as *hwee* by the ear of the native, gives the species its common name of juí (pronounced *hwe*). To one familiar with the habits and notes of North American birds, the present form is suggestive of the western wood-pewee.

During the latter part of April and May these flycatchers were seen inspecting holes in trees which were evidently used for nests. A breeding male was taken at Patillas, May 13, and on July 5 along the Rio Guajataca, near Quebradillas, a party of three young, just out of the nest, was observed. After this time young were common.

On Vieques Island, from March 16 to April 3, 1912, I found this flycatcher fairly common and preserved seven as specimens. A mated pair was seen March 23. The birds here inhabited brush-grown pastures and often called from perches where they could not be seen. Skins from this island appear identical in color with those from Porto Rico.

On April 6 and 20, 1912, I heard the unmistakable call of the juí in dense jungle on Punta Soldado, Culebra Island, but was unable to locate the bird amid the heavy vegetation. The species has not been reported previously from Culebra; it is, therefore, unfortunate that one was not taken.

This flycatcher feeds mainly on Hemiptera, weevils, caterpillars and occasional Hymenoptera, but eats such wild fruits as the espino (*Xanthoxylum*), moral (*Cordia*), nightshade (*Solanum*), and wild fig (*Ficus*). It is one of the beneficial species of the island.

The bird is unassuming in color and in a way seems a small edition of the clérigo, as it is dusky brown above, with light edgings on the feathers of the wings, and grayish white below, lighter on the abdomen. It is seven inches or a little more in length and is slender in form.

To the superstitious countryman the note of the juí is an omen, regarded as the forerunner of news—whether this be good or bad, the bird is credited with prescience in foretelling its arrival.

The flycatchers of this genus found in the Bahamas and greater Antilles are listed by Hellmayr as subspecies of the Jamaican *M. stolidus*.

Differences between them in my estimation are such as to warrant continuance of the more usual treatment of *M. antillarum* as a distinct species.

***Blacicus blancoi* Cabanis**

Porto Rican Wood Pewee, Bobito, Juf, Juf Pequeño

Blacicus blancoi Cabanis, Journ. für Ornith., 1875, p. 224. (Porto Rico.)

Porto Rican Wood Pewee, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).

Contopus blancoi, Cory, Auk, 1892, p. 229 (Porto Rico, specimen).

Blacicus blancoi, Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 171; Anales Soc. Esp. Hist. Nat., 1878, p. 195 (Mayagüez and Quebradillas).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 141 (Porto Rico, specimens).—Cory, Auk, 1886, p. 242 (Porto Rico); Cat. West Indian Birds, 1892, pp. 109, 132 (Porto Rico).—Bowditch, Auk, 1903, p. 11 (western Porto Rico, specimens).—Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 538 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 83-84; Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 325 (bones from Cueva Catedral near Morovís).—Struthers, Auk, 1923, p. 475 (Mayagüez).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 98, (Mayagüez).

Blacicus latirostris blancoi, Hellmayr, Cat. Birds Americas, Pt. V, Field Mus. Nat. Hist., Zool. Ser., Vol. XIII, April 11, 1927, p. 206 (Porto Rico).

Central and western Porto Rico; fairly common.

I found this species at Salinas, April 26 to May 2, 1912 (specimens); Juana Diaz, August 17 to 22 (specimens); Yauco, May 16 to 28 (specimens); Cabo Rojo, August 24 to 31 (specimens); Mayagüez, June 6; Maricao, May 29 to June 5 (specimens); Lares, June 18 to July 1 (specimens); Utuado, August 3 to 9 (specimen); Ciales, July 15; and Aibonito, January 26 to February 5 (specimens). In the U. S. National Museum there is a series from Mayagüez and skins from Arecibo and Utuado, and in the Museum of Comparative Zoölogy one from San Germán. Gundlach reports it from Quebradillas and Mayagüez. Curiously enough, this species is not reported from the eastern half of the island beyond a line passing through Salinas, Aibonito and Ciales, except for a few recorded by Potts in January, 1922, north of Central Aguirre and for bones that I have identified in cavern material from the Cueva Catedral, near Morovís, taken by Anthony.

The wood pewee frequents coffee plantations or small patches of second-growth and on the south coast is found in brushy pastures. Near Cabo Rojo I encountered it at the borders of mangrove swamps. It is so inconspicuous that it is usually overlooked, with the result that very few of the country people know it or have a name for it. In the coffee plantations it is usually found near the heads of small valleys or on the

middle portion of long, steep slopes. It usually perches on dead limbs not far above the ground, from which it makes short sallies after insects, returning often to the same perch and seldom flying far. The call-note of the males is a low, tremulous *pree-e-e-e*, given at times with trembling wings, that cannot be heard more than a hundred yards, and is so ventriloquial that its direction and the distance from which it comes are difficult to determine. Frequently from a perch not thirty feet away a bird will call for several minutes before it is seen, so still does it sit and so well do its colors harmonize with its background. The females are silent and usually appear suddenly on a limb directly in front of one. Though I found no nests, the breeding season appears to be in May. In July and August the birds were molting badly.

On June 27, 1901, near Mayagüez, Bowdish found a deserted nest that he attributed to this species, hung in the tips of a branch fifteen feet from the ground, in a coffee plantation. The nest was made of fine rootlets and green moss, and was so frail that the addled egg that it contained could be seen from below. This egg, now in the U. S. National Museum, is white tinged faintly with buff, with a wreath of spots and blotches ranging from pale neutral gray to Army brown, warm sepia and Vandyke brown, with a few spots that are almost black. It measures 17.3 x 13.8 mm.

The Porto Rican wood pewee is a true insect-destroyer, as Diptera, Hymenoptera, Coleoptera and other small insects comprise practically all of its food.

As the species is only five and one-half inches long, it is easily identified by its small size. The underparts are rather dull cinnamon-buff and the upper surface dull olive-brown, darker on the head.

Distinction between *Blacicus blancoi* of Porto Rico, and *B. brunneicapillus* and *B. latirostris* of Dominica and St. Lucia, respectively, is sufficient to maintain these as distinct species. They are sufficiently similar to be considered one "Formen-Kreis" but should not be made subspecies of *latirostris* as has been indicated by Hillmayr.

***Elaenia martinica riisii* Sclater**

Riise's Elaenia, Ruiseñor Pequeño

Elaenia riisii Sclater, Proc. Zool. Soc. London, 1860, p. 314. (St. Thomas.)—Newton, Ibis, 1860, p. 307 (St. Thomas, specimens).

Tyrannula martinica, Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 375 (St. Thomas, specimen).

Elaenia martinica, Cory, Auk, 1890, pp. 374, 375 (Anegada, Virgin Gorda, specimens).

Elainea pagana martinica, Cory, Cat. West Indian Birds, 1892, p. 109 (Tortola, Virgin Gorda).

Elaenia martinica martinica, Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 428 (St. Thomas, Tortola, Virgin Gorda).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 84-85 (Vieques, Culebra, Culebrita, Louis Peña); Auk, 1916, pp. 415-416 (Vieques, specimens); Auk, 1917, pp. 60-61 (Culebra, specimens; Louis Peña, Culebrita).

Elainea martinica riisii, Peters, Occ. Pap. Boston Soc. Nat. Hist., June 7, 1926, Vol. V, pp. 199, 200 (Vieques, Culebra, Culebrita, St. Thomas, Tortola, Anegada).

Vieques, Culebra, Culebrita, Louis Peña, St. Thomas, Virgin Gorda, Tortola and Anegada; fairly common.

On Vieques Island I secured specimens of this bird on March 25 and 27. They were found in thorny jungle on dry, hot slopes in the eastern and southern parts of the island, in areas where the scrub was almost impenetrable. Their habits differed decidedly from those usual in their family. At times they rested quietly and made sallies after passing insects like any ordinary flycatcher, and again were seen searching and climbing about among limbs like a vireo or titmouse. To collect specimens was extremely difficult. When the birds had been located by their calls, it was necessary to cut a trail into the spiny scrub before one could see them, and then to hew a further path to retrieve them when they had been shot. I did not note them until March 25, and for this reason, and since they had not been found by previous collectors, I thought that possibly they were migratory, but in this conclusion I may well have been mistaken. They were about to breed at this season.

On Culebra this flycatcher was fairly common from April 5 to 21 in dense growths of cactus and spiny shrubs that covered considerable areas over dry hillsides. They were heard calling on Louis Peña, April 11, and one was taken on Culebrita, April 15. They moved about very little, seldom flying more than a few feet at a time; so that at times I heard their sharply explosive, whistled call-notes for half an hour without being able to catch sight of them in the dense scrub. Twice I heard them singing a sweet, warbling song. Specimens were taken on April 15 and 20, and I noted about twenty individuals during the course of my work. Natives have no special name for the bird, but recognize it as a small mockingbird because of its sweet song.

The form is known from St. Thomas through the collections of Salvin, Swift and Riise in the sixties. Two skins dating from this period are in the collections of the U. S. National Museum, with a third taken by F. A. Ober. Cory, in 1890, recorded skins from Anegada and Virgin Gorda taken by Winch, but in 1892 did not mention Anegada, indicating

Tortola instead. There is uncertainty as to what he intended. Peters, however, has recorded specimens from both these islands.

In ten stomachs of these birds vegetable food, made up of seeds and drupes, mainly of euphorbias and nightshade, comprised 85 per cent. The animal food was composed of spiders, beetles and caterpillars.

The elaeenia is about six inches in length, light brownish olive above and grayish white below, with prominent white wing bars and a concealed crest spot of white.

Peters, the latest authority to revise this species, has indicated that the bird from the Virgin Islands is smaller than typical *E. m. martinica*, much grayer above, with wider wing bars, and well-defined grayish white tips to the tail. With these specifications the results of my own studies fully agree.

Suborder OSCINES

Family HIRUNDINIDAE

[*Iridoprocne bicolor* (Vieillot)]

Tree Swallow

Hirundo bicolor Vieillot, Ois. Amer. Sept., 1807 (1808), Vol. I, p. 61, Pl. 31. (Middle eastern United States.)

Tree Swallow, Danforth, Oölogist, 1922, p. 11 (seen, December).

Hirundo bicolor, Bello, Zool. Gart., 1871, p. 350 (listed).

Tachycineta bicolor, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 172; Anales Soc. Esp. Hist. Nat., 1878, p. 199 (pictured in album of Bello).—Stahl, Faun. Puerto Rico, 1883, p. 61 (listed).

Iridoprocne bicolor, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 85 (hypothetical).

On present evidence the tree swallow is placed in the hypothetical list of Porto Rican birds. Gundlach reports a picture of this species in the album of Dr. Bello, but did not see the bird personally. Danforth has reported it in the Oölogist as common in December in the vicinity of Mayagüez, but makes no further comment regarding it. The species passes through Cuba in enormous numbers during spring and fall and may occasionally reach Porto Rico. This, however, remains to be substantiated.

The bird is pure white below and steel blue above.]

Riparia riparia riparia (Linnaeus)

Bank Swallow, Golondrina, Golondrina Riberiega

Hirundo riparia Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 192. (Sweden.)

Bank swallow, Danforth, Oölogist, 1922, p. 177 (western Porto Rico, seen).

Hirundo riparia, Bello, Zool. Gart., 1871, p. 350 (listed).

Clivicola riparia, Cory, Cat. West Indian Birds, 1892, p. 115 (Porto Rico).

Cotyle riparia, Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 172; Anales Soc. Esp. Hist. Nat., 1878, p. 199 (pictured in album of Dr. Bello).—Stahl, Faun. Puerto Rico, 1883, p. 61 (rare migrant).

Riparia riparia, Ridgway, U. S. Nat. Mus. Bull. 50, 1904, Pt. 3, p. 74 (Porto Rico).

Riparia riparia riparia, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 85 (hypothetical, Porto Rico).—Struthers, Auk, 1923, p. 475 (Anegado Lagoon, specimen).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 112-113 (Cartagena and Anegado Lagoons).

Porto Rico; rare in migration and during winter.

Gundlach reported the bank swallow on the basis of a painting seen in the album of Dr. Bello, but failed to encounter the species. Inasmuch as some other records from Bello have seemed uncertain, this statement, unsupported by other evidence, has been deemed too slight to justify inclusion of the bank swallow in the Porto Rican list. However, Danforth found it at Anegado and Cartagena lagoons from March 4 to April 8, 1922, and from February 19 to April 30, 1924, at Cartagena, and Struthers secured a specimen on February 18, 1922, at Anegado Lagoon.

The bank swallow is a species of small size, grayish brown above and white below, with a distinct dark band across the breast.

***Hirundo erythrogaster* Boddaert**

Barn Swallow, Golondrina

Hirundo erythrogaster Boddaert, Tabl. Planch. Enl., 1783, p. 45. (Cayenne.)

Barn Swallow, Danforth, Oölogist, 1922, p. 177 (western Porto Rico, winter).

Chelidon erythrogastra, Cory, Auk, 1886, p. 59 (St. Croix); Cat. West Indian Birds, 1892, p. 115 (Porto Rico, St. Croix).

Hirundo horreorum, Newton, Ibis, 1859, pp. 66-67 (St. Croix).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 172; Anales Soc. Esp. Hist. Nat., 1878, p. 197 (Porto Rico, taken September).—Stahl, Faun. Puerto Rico, 1883, p. 61 (rare migrant).

Hirundo erythrogastra, Ridgway, U. S. Nat. Mus. Bull. 50, 1904, Pt. 3, p. 81 (Porto Rico, St. Croix).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 85 (one seen, Mameyes).—Struthers, Auk, 1923, p. 475 (Cartagena and Anegado lagoons).

Hirundo rustica erythrogaster, Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 112 (Cartagena and Anegado lagoons).

Porto Rico, irregularly common migrant, uncommon winter resident; St. Croix, recorded.

Gundlach reported the barn swallow in Porto Rico only in September. Mr. F. A. Potts informs me that he saw a few in company with cliff swallows on December 2 and 7, 1920, at the Coamo Reservoir, three miles northwest of Santa Isabel, and that in 1921 barn swallows arrived at Central Aguirre, August 24, and were fairly common and at times abundant until the date of his letter, September 18. Nearly one hundred were seen on one occasion. Danforth has reported the species as an uncommon winter resident in 1921-1922, and recorded the last at Cartagena Lagoon on May 14, 1922, and May 23, 1924, and the first in fall, August 26, 1924. Struthers found barn swallows at Cartagena Lagoon, March 21, August 29 and October 8, 1921, and at Anegado Lagoon, February 18, 1922. In 1912 I saw one individual on the playa at Punta Picua, opposite Mameyes, February 16.

Newton reports the arrival of the barn swallow on St. Croix on September 13, 1858, and noted it daily until observations were terminated on September 28. On one occasion several hundred were seen over a lagoon.

The barn swallow has a pleasingly graceful flight that carries it low over the surface of vegetation or high in the air, according to the distribution of its insect food. It is easily told from other species by the deeply forked tail. The upper surface is steel-blue. Males are chestnut-brown below, while females are nearly white.

***Petrochelidon fulva poeciloma* (Gosse)**

Jamaican Cliff Swallow, Golondrina, Golondrina de Cuevas

Hirundo poeciloma Gosse, Birds Jamaica, 1847, p. 64. (Jamaica.)

Jamaican Cliff Swallow, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).

Hirundo fulva, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 252 (Porto Rico).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 598 (listed from Bryant).

Petrochelidon poeciloma, Gundlach, Journ. für Ornith., 1874, p. 311 (Porto Rico, specimen).

Petrochelidon fulva, Gundlach, Journ. für Ornith., 1878, pp. 159, 172; Anales Soc. Esp. Hist. Nat., 1878, p. 198 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 146 (Porto Rico, specimens); Ornis, 1887, pp. 450, 451, 452 (listed as migrant, leaving in September).—Cory, Cat. West Indian Birds, 1892, p. 115 (Porto Rico).—Bowditch, Auk, 1903, p. 15 (Porto Rico, resident).—Wetmore, Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 325 (bones from cave near Morovís).

Petrochelidon fulva poeciloma, Ridgway, U. S. Nat. Mus. Bull. 50, 1904, Pt. 3, p. 55 (Porto Rico?).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 85-87 (Porto Rico, habits).—Struthers, Auk, 1923, p. 475 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 111-112 (Cartagena Lagoon).

Porto Rico, locally common resident; restricted to favorable localities during the breeding season but afterwards wandering.

I recorded the cliff swallow as follows: Quebradillas, July 2 to 6, 1912; Manatí, July 7 to 11; Bayamón, July 20 to 25; Río Piedras, December 16, 1911 to January 4, 1912; Mameyes, February 9 to 29; Humacao, September 3 to 9; Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31, and Aguadilla, June 9 to 12. Inland it was noted only at Lares, June 18 to July 1; Utuado, August 3 to 9, and Ciales, July 12 to 18. The species is most abundant on the western half of Porto Rico and few individuals were noted on the east coast. Mr. F. A. Potts writes me that the species was common east to Guayama after September 5, 1921, and that from November, 1920, to April 14, 1921, flocks were recorded east of Central Aguirre. At the latter date they disappeared. As yet the bird is not known to breed in this southeastern section of the island. The species was generally confined to the coast region, being found inland only in the northwestern portion in an area extending from Lares through Utuado to Ciales.

This small swallow usually is seen in little parties, feeding on the wing, with light and graceful flight, above pastures, lowlands, meadows or along beaches. The usual call is a soft *chu chu*; males uttered a chattering, twittering song while flying swiftly and directly through the air.

This species breeds from April to June, gathering in colonies for the purpose and nesting on the overhanging faces of cliffs or in caves—a practice so universally recognized that “La Cueva de las Golondrinas” is a common appellation given to caverns in Porto Rico. A mud rim made of pellets carried in the mouth is thrown up on the outer edge of small shelves or holes, and behind this a felted mass of plant downs from cactus and other growths is placed to receive the eggs. From fragments of shells examined, these appear to agree closely with the eggs of *P. lunifrons*, being white, spotted with reddish brown and lilac.

North of Aguadilla during the first week in June about forty pairs were nesting in small caves in the cliffs above the ocean, some being located only twenty feet above the waves. Nests found here were in holes where it was difficult to reach them. The birds circled about in a close flock before the entrance to the caverns, calling excitedly and flying up two or three at a time to hover for an instant in front of the nest before dropping back to circle with the others. It would seem that in such situations there must be great mortality among the young, for on leaving the nest they must fly out over the waves, with a considerable rise necessary to reach the safety of land at the top of the cliff. I collected one nearly fledged bird from a nest on June 10.

East of Lares, on June 20, in "La Cueva Pajita," a grotto two hundred feet long and open at both ends, there was a colony of about three hundred of these swallows, some of them near the entrance and others so far in the interior that the birds could not be distinguished in the obscurity from the large bats that circled about with them. Some of the ledges supporting nests were so narrow that the sitting bird was forced against the wall, greatly abrading the feathers of the sides of the breast. As this wear occurs only on one side, the bird must always have faced the same way while on the nest. Both male and female incubate, for this wear was observed in specimens of both sexes. About this colony immature birds were seen on the wing, following the parents and teasing for food, while other adults were still nest-building. When tired, young birds perched in the leafy tops of the trees. Struthers reports that young on the wing are common in July.

Gundlach in the seventies noted that the cliff swallows nested occasionally under eaves of buildings, and one instance of this kind came under my observation. In the train shed of the Linea Ferrea del Oeste at Bayamón a small colony was building against the rafters inside and one pair had constructed a nest on a beam in the gable of the hotel across the street. These nests, when finished, were globular in shape, only two being seen with the long bottle neck found in the nest of *P. lunifrons*, and those two imperfect. The greater part had merely a large circular entrance in the side, rough in outline, and a few were simple platforms of mud. In August these swallows gathered in little bands of twenty-five or thirty, feeding over the lowlands and resting close together in twittering flocks on the telephone wires along the roads. During heavy rainstorms they seemed to have a hard time in keeping up against the downpour, as they continually struggled to rise and were as steadily beaten down. Such storms would, without doubt, prove fatal to many of the young before they became strong on the wing.

After careful comparison of a series of twenty-four skins from Porto Rico (taken personally) with ten from Jamaica, I am unable to detect any constant difference between the two groups; so that the Porto Rican bird is identified as *P. f. poeciloma*.

The cliff swallow lives entirely on animal food—mainly beetles, flies and true bugs. I found four hundred engraver beetles of the genus *Platypus* in one bird, which indicates the success of their aerial search for food.

The Jamaican cliff swallow is steel blue above, with more or less chestnut on rump, around neck, forehead and underparts, and the abdomen is white. It will be confused only with the barn swallow, from

which it may be distinguished by the slight notch in the tail instead of the deep fork of the related species.

Progne dominicensis (Gmelin)

Caribbean Martin, Golondrina, Golondrina de Iglesias

Hirundo dominicensis Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 1025. (Santo Domingo.)

Hirundo purpurea, Bello, Zool. Gart., 1871, p. 350 (Porto Rico, listed).

Hirundo dominicensis, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto Ricco, 1810, Vol. II, p. 205 (Porto Rico).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, p. 252 (Porto Rico).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 598 (listed).

Progne dominicensis, Taylor, Ibis, 1864, p. 166 (Porto Rico).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 172; Anales Soc. Esp. Hist. Nat., 1878, p. 196 (Porto Rico, breeding January to September).—Stahl, Faun. Puerto Rico, 1883, pp. 61, 146 (Porto Rico, specimens); Ornis, 1887, pp. 450, 451, 453 (migrant).—Bowditch, Oölogist, 1900, p. 74 (Vieques); Auk, 1903, p. 15 (Mona, Porto Rico, Vieques, migratory).—Ridgway, U. S. Nat. Mus. Bull. 50, 1904, Pt. 3, p. 39 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 88-89 (Porto Rico, Vieques); Auk, 1916, p. 416 (Vieques).—Struthers, Auk, 1923, pp. 475-476 (Porto Rico, summer).—Schmidt, Field Mus. Nat. Hist., Zoöl. Ser., 1926, Vol. XII, 151 (Mona).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 111 (Cartagena Lagoon).

Mona, Porto Rico, Vieques, common during breeding season; absent in winter.

Bowditch reports the Caribbean martin as common on Mona Island from August 9 to 21, 1901; he supposed that it nested in crevices in the rock about the mouths of caves.

My field notes record the martin from the Río Guajataca near Quebradillas, July 2 to 6, 1912; Manatí, July 7 to 11; Bayamón, July 20 to 25; Mameyes, February 9 to 29; Humacao, September 3 to 9; Yabucoa, May 3 to 10; Salinas, April 26 to May 2; Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Mayagüez, June 6; Añasco, June 7 to 8; Aguadilla, June 9 to 12; Maricao, May 29 to June 5; Lares, June 18 to July 1; Utuado, August 3 to 9; Adjuntas, August 10 to 16; Ciales, July 12 to 18; Comerio, July 26 to 31; Aibonito, January 26 to February 5; Caguas, September 2; Cayey, January 23 to 25; Hacienda Catalina, below El Yunque, March 5 and 6. The Caribbean martin is present only during the breeding season and leaves the island in fall. The first arrivals of the year were seen at Cayey on January 23, and after this I found them common. Gundlach reported them from the first of the year until September, while Dr. Stahl

says that they arrive regularly from the end of January to the first of February, and gives December 23 as the earliest date in eight years of observation. In the U. S. National Museum there is a specimen taken at San Juan, January 4, 1899, by J. D. Milligan, and one in the Carnegie Museum secured at Loiza, February 16, 1912, by W. W. Worthington. Danforth reports the earliest dates of arrival at Cartagena Lagoon as January 6, 1922, and February 19, 1924, and the latest date of departure at Mayagüez as September 9, 1924.

On August 16, 1912, while I was on the summit of the range above Adjuntas, martins were heard continually so high overhead that they could not be seen, while occasionally three or four swept down over the mountain slopes and then were away. These were evidently migrant birds, as they were working steadily southward. In some localities birds were still feeding young at this date.

Bowdish noted a bird in San Juan, October 13, 1899, as the only one seen in some time, while Struthers recorded the last one noted at Mayagüez as of October 8, 1921. At Mameyes natives informed me that in winter the large swallows flew to Africa—a tale evidently dating back to European ancestors!

In 1912, immediately on arrival, martins began with much calling and warbling to investigate nesting holes in the church towers and in the eaves of buildings. In the wilder localities a few still adhere to their ancient nesting sites in hollow trees, though the greater number now nest in the towns. Near Mameyes a male was seen disputing possession of a hole in a coconut palm with a woodpecker, and there were quite a number nesting there in such locations. Struthers reports nests in coconut palms in May, 1921. On the estate known as Manantial, north of Guánica, about thirty individuals were nesting in small openings in the sides of an old brick chimney that stood seventy-five feet high, and birds were found occupying holes in trees near the Hacienda Catalina and along the Río Guajataca near Quebradillas. They were observed carrying nesting material as early as February 9, but nest-building seemed to be rather a dilatory process, taking some time, and apparently eggs were not deposited until May 1. The first young seen on the wing were observed at Comerio, July 27; others were still feeding fledglings in the eaves of the church at Cabo Rojo the last of August, though some of the earlier-nesting birds appeared then to have left the island. Only one brood seems to be raised.

The Caribbean martin is strong and vigorous on the wing, sweeping about in great circles, with much calling and chattering in characteristic martin tone. The greater number of these martins remain in or about

towns, perching on wires and the roofs of the houses and feeding high overhead. Sometimes parties are found about the mouths of lagoons and rivers, frequently darting swiftly down at a boat in the water, turning abruptly and then rising to repeat the performance. On cold, rainy days they follow cattle in the pastures for the insects that these quadrupeds disturb in passing through vegetation, and on other occasions sweep back and forth along sheltered gullies where food is abundant. At Cabo Rojo the screaming and talking of a parrot hanging in a cage interested the martins greatly. Four or five would gather on a wire above it, peering down, twittering and lifting their wings nervously, until, at some piercing shriek, they left precipitately.

On Vieques Island Bowdish found a few at Isabel II early in February. I saw one or two pairs in the village from March 16 to April 3, 1912, but did not observe them in the surrounding country.

The martin feeds entirely upon insects and so is a beneficial species. In 1912 I saw no indications of artificial nesting boxes, but there is no reason to suppose that the birds would not use such readily if made available.

The adult male is steel blue with white abdomen. The female and young male are steel blue above, grayish brown on throat, breast and sides and white on the rest of the lower surface.

Family CORVIDAE

Subfamily CORVINAE

Corvus leucognaphalus Daudin

Porto Rican Crow, Cuervo

Corvus leucognaphalus Daudin, Trait. d'Orn., 1800, Vol. II, p. 231. (Porto Rico.)

Corax crucirostra Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 204. (Porto Rico, described from an abnormal specimen.)

Cornix jamaicensis, Moritz, Wieg. Arch. Naturg., 1836, p. 389 (Porto Rico).

Corvus leucognaphalus, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 204 (Porto Rico).—Taylor, Ibis, 1864, p. 168 (Porto Rico, specimens).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 598 (listed).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 178-179; Anales Soc. Esp. Hist. Nat., 1878, p. 214 (Lares, Caguana, Quebradillas, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 144 (Porto Rico, specimens).—Cory, Auk, 1886, p. 227 (Porto Rico); Cat. West Indian Birds, 1892, pp. 109, 145 (Porto Rico).—Bowdish, Auk, 1903, p. 11

(Caguas, reported).—Wetmore, Proc. U. S. Nat. Mus., 1918, Vol. 54, pp. 521-522; Auk, 1925, p. 446 (bones from kitchen midden, St. Croix).
Corvus leucognaphalus leucognaphalus, Ridgway, U. S. Nat. Mus. Bull. 50, 1904, Pt. 3, p. 279 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 94-95 (El Yunque, specimens).

Porto Rico; resident, rare. St. Croix; bones found in midden deposits.

Formerly the Porto Rican crow was abundant, but at the present time its numbers are few. Naturalists who visited Porto Rico with Ledru one hundred thirty years ago secured the type of the species for the Paris Museum, and apparently found the bird common, as they report its flesh as good to eat. One specimen that they took had an abnormal bill with crossed mandibles and was described as a distinct species. Moritz, in 1836, reported the crow as living on fruits, and Taylor saw and collected it in 1863 (probably on the Río Loisa at the estate of George Latimer that was known as Punta). Gundlach found many individuals at the Cueva Pajita near Lares, and in Caguana, in the vicinity of Utuado, and says that it was reported from Quebradillas and the eastern part of the island. Stahl had two specimens. Bowdish did not see it, but heard reports of it, probably incorrect, from near Caguas.

These birds have more the nature and the habits of ravens than crows—a resemblance borne out by their strange notes. They seem to thrive only where there are extensive growths of natural forest, and when these are cut down the crow disappears. I observed crows only in March, 1912, along the west fork of the Río Mameyes, where they were breeding, nests apparently containing both eggs and well-grown young. All were inaccessible, as they were located in the tops of tall tabanuco trees. The crows kept well concealed in the leaves high above, and only by patiently watching could one locate them. They exhibited considerable curiosity and once, when I was hidden in some tall grass at the edge of a clearing, two came down to examine the place. On my second visit to this colony all the birds left, going higher into the mountains, though every half hour or so four or five came circling back, high in the air, and perhaps one or two would alight on some high, dead limb, projecting above the forest, where they croaked and called, lifting the wings nervously. Later on a flock of about twenty-five was found near the forks of the Río Mameyes, but these birds were very wild, keeping entirely to the higher slopes of the hills. On days when it was cold and rainy on the summit of El Yunque, the crows descended into the warmer valleys, and when it cleared rose and circled back to the higher peaks.

The ordinary call-note is a high-pitched *klook*, or a deep *wallough*, varied by any number of indescribable gutturals and gabbling calls, with none of the vociferous cawing of our crows. The natives claim that the crow lives for many years and credit it with great sagacity, including an ability to speak Spanish upon occasion—a belief which forms the basis of several stories current among the hill people. Captive birds, it is said, really learn a few words if captured when young. They are prized as food by the country people and were formerly hunted as game. At times, it is said, they descend to coastal swamps near Mameyes.

The iris is bright reddish brown.

Of nine stomachs that I examined, one contained remains of a nestling passerine bird and two bones of tree-toads, but 90 per cent of the food was made up of wild berries and drupes, such as those of the tabonuco (*Dacryodes excelsa*) and a palm. The crows were seen eating wild fruits of several kinds.

Mr. Leopold B. Strube, of the Hacienda Jobo, near Utuado, informed me in 1912 that there had formerly been numbers of the birds about Utuado, but that they had disappeared for no apparent reason five or six years before.

Bones of this species have come from kitchen middens in two localities on St. Croix: one near the mouth of Salt River, and the other on the Richmond estate, near Christiansted (identified in material presented to the U. S. National Museum by Mrs. Hugo Hark). Apparently the bird sojourned on this island in ancient times, when it was covered with forests, but there are no modern records for living individuals. (It is possible that the bones found in kitchen middens may have come from captive birds brought from Porto Rico by Indians, though I consider this doubtful.)

When Mr. Ridgway separated a Haitian form of this bird as *Corvus leucognaphalus erythrophthalmus* (Württemberg), he had available only a few skins from Porto Rico and from the island of Haiti, a part with sex wrongly indicated. My own collections include nine skins from Porto Rico, while Dr. W. L. Abbott has recently presented to the U. S. National Museum seven from the Dominican Republic. A short time ago I compared these critically, at the request of Col. R. Meinertzhagen, for his revision of the genus *Corvus*, and found that birds from the two islands do not differ appreciably one from another, as they are almost identical in measurements and show no differences in color. My series from Porto Rico—all taken March 4 and 6, 1912, near the Hacienda Catalina, on the slopes of the great mountain El Yunque—have the following measurement (in millimeters):

	Wing	Tail	Culmen from base	Tarsus
3 males.....	300-312	192.2-202.5	55.7-57.5	50.0-53.2
6 females.....	288-298	177.0-193.5	52.7-56.5	50.0-54.1

In addition to these, there are two old skins from Porto Rico, without data, in the U. S. National Museum, one from the Bryant collection and one taken by Latimer.

The species is distinguished by its large size and totally black color, with white bases on the feathers of the head and lower surface.

Corvus pumilis Wetmore

Lesser Porto Rican Crow, Solitario

Corvus pumilis Wetmore, Proc. Biol. Soc. Washington, December 30, 1920, p. 81. (Cueva San Miguel, near Morovís, Porto Rico.) Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 327-328 (further comment).



FIG. 19.—The extinct lesser Porto Rican crow or solitario (*Corvus pumilis*). Right ulna (type). Inner face. Natural size. From cavern deposits of Cueva San Miguel.

(Courtesy of The American Museum of Natural History.)

Porto Rico; now extinct.

While traveling in Porto Rico in 1912 I heard occasional rumor of a form of crow smaller than the ordinary cuervo (*Corvus leucognaphalus*), distinguished under the name solitario, and said to have been found many years before on the wooded hills below the town of Lares. This apparently mythical story of a species which I did not succeed in finding alive has since been substantiated by the discovery of an ulna (Fig. 19), of a crow much smaller than *leucognaphalus* in material collected in July, 1916, by H. E. Anthony in the bone deposits of Cueva San Miguel near Morovís.

The ulna that serves as a type for *pumilis* has a total length of 68 mm., while in four specimens of *leucognaphalus* this bone measures 75 to 76 mm. *C. pumilis* was thus smaller than the modern cuervo, but was somewhat larger than *C. palmarum*. Apparently *pumilis* was about the size of the fish crow of the United States.

With the discovery of *C. pumilis* there are now known two sizes of crow—one large and one small—on Cuba, Haiti and Porto Rico.

Family MIMIDAE

Mimus polyglottos orpheus (Linnaeus)

Jamaican Mockingbird, Ruiseñor, Sinsonte

Turdus orpheus Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 169. (Jamaica.)
 Jamaican Mockingbird, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Turdus polyglottos, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto Ricco, 1810, Vol. II, pp. 203, 270-272 (Porto Rico).

Mimus polyglottus, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 595 (Porto Rico, specimens).—Gundlach, Anales Soc. Esp. Hist. Nat., 1878, p. 173 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 138 (Porto Rico, specimens).

Mimus polyglottos, Bello, Zool. Gart., 1871, p. 350 (listed).—Wetmore, Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 325-326 (bones from caves near Morovís).

Mimus polyglottos portoricensis Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 251. (Described as new from Porto Rico).—Cory, Auk, 1891, p. 46 (Porto Rico); Cat. West Indian Birds, 1892, pp. 121, 132 (Porto Rico).

Mimus polyglottos orpheus, Moritz, Wieg. Arch. Naturg., 1836, p. 388 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 166-167 (Porto Rico, specimens).—Bowditch, Oölogist, 1900, p. 74 (Vieques); Auk, 1903, p. 19 (Porto Rico, Vieques).—Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 232 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 90-92 (Porto Rico, Vieques); Auk, 1916, p. 416 (Vieques, specimens); Auk, 1917, pp. 55, 61 (Culebra, Culebrita).—Griscom, Auk, 1921, p. 46 (St. Thomas, specimens).—Struthers, Auk, 1923, p. 476 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 123-124 (western Porto Rico).

Porto Rico, Vieques, Culebra, Culebrita, St. Thomas; resident.

My records indicate the following distribution for the mockingbird in Porto Rico: Quebradillas, July 2 to 6, 1912; Manatí, July 7 to 11; Toa Alta, August 2; Bayamón, July 20 to 25; Río Piedras, December 16, 1911, to January 4, 1912 (specimens); Mameyes, February 9 to 29 (specimens); Humacao, September 3 to 9; Yabucoa, May 3 to 10; Patillas, May 13 (specimen); Salinas, April 26 to May 2 (specimen); Juana Diaz, August 17 to 22 (specimen); Yauco, May 12 to 28 (specimens); Cabo Rojo, August 24 to 31 (specimens); Mayagüez, June 6; Añasco, July 7 to 8; Aguadilla, June 9 to 12; Lares, June 18 to July 1; Utuado, August 3 and 5; Comerio, July 26 to 31 (specimen); Ciales, July 12 to 18; Aibonito, January 26; Caguas, January 5 to 14; Cayey, January 15 to 25, and the Hacienda Catalina below El Yunque, March 2 to 11. In Porto Rico mockers are more common in the lowlands, few

being seen above a thousand feet elevation; some were found in open pastures near Aibonito, and on Mount Pelado above Cayey, among the higher points visited, but the coffee fincas and forests common in the hills were too dense to attract them generally. They seem to thrive best in a dry climate, as they are most abundant along the south coast. They frequent tree-dotted pastures, hedges and thickets; near Guánica they are common through the open cane-fields, feeding on the ground in the newly plowed lands, and following the fences through the cane, where there is little or no cover. I found them especially common in the citrus groves around Bayamón and Manatí. Bones of this species were obtained from old cavern deposits near Morovís.

When hidden in thickets, mockers are shy and secretive; but the males, singing from the top of some tree or bush, flying up a few feet and then dropping back, and lifting their wings as they sing, are a most conspicuous feature in the landscape. The period of song extends from January until July, after which they become silent except for their scolding notes. The nesting season extends from January until June. Birds were seen nest-building near Caguas, January 5; and near Mameyes in February nearly all the females examined were incubating. Bowdish records a nest at San Juan, March 12, 1899, containing three young, and one at Aguadilla with seven eggs. He describes the nests as similar to those found in the United States. Gundlach reports four to six eggs as the usual set.

Mockingbirds were noted as common cage birds, and it was a frequent practice everywhere to take the young from the nest. Usually they were procured when quite young, and hung in cages in the bushes, where the adults could feed them. Fine singers among the males were valued as high as ten or fifteen dollars. In the country districts they were sometimes kept in rude cages made from a large calabash with string laced across the opening to prevent escape. The natives in some sections have a curious belief to the effect that the sex in captives may be told by the form of the tongue, which they say is split in males and entire in females! It would seem that this could be made to suit the needs of unscrupulous venders!

Mockers were observed many times running about on the ground in plowed fields far from any cover, though ordinarily they are inhabitants of thickets. The song of the male, with many rich notes and imitations of other birds, delivered from some conspicuous perch, is one of the finest sounds of the countryside, and the mockingbird is by far the best of songsters found in Porto Rico. The display that is frequent in the breeding season, in which the male flies out with slowly moving wings,

fully spread to display their flashy white markings, is as pleasing as the notes that accompany it. The usual call-note is harsh in tone.

Bowditch reported the mockingbird from Vieques Island in 1900, and I found it very common there and secured a series of specimens from March 16 to April 3, 1912. The brush-grown pastures of this relatively dry island seemed well suited to it, and it was distributed everywhere through pastures and fields. The period of my visit marked the height of the breeding season; a nest containing four young nearly a week old was seen on April 3.

On Culebra Island the mocker was somewhat less abundant from April 5 to 21, 1912 (several taken). The birds were nesting at this period. The species was observed on Culebrita Island, April 15.

Griscom has recorded a series of this form collected on St. Thomas during August and September, 1916, by R. H. Beck. The bird has not been reported previously from that point, and is not known at present from any of the other islands here under discussion.

I have carefully compared series from Cuba, Grand Cayman, Jamaica, Porto Rico, Vieques and Culebra and find birds from these widely separated islands so nearly the same in size and coloration that they must be considered representative of one form. The darker coloration at one time supposed to differentiate the bird from Porto Rico does not hold. Griscom reports skins from St. Thomas as belonging to this race. The distribution is anomalous, since the range is interrupted by the occurrence of the distinct *Mimus p. dominicus* on the island of Haiti, and one is led to speculate on the possibility of man as an agency in establishing *orpheus* in the widely separated islands that comprise its range, in view of the fact that he keeps it commonly as a cage bird. This is especially true for St. Thomas, for 1916 seems to be the first recorded date of its occurrence, though apparently it was then common.

The mockingbird, nine inches in length, is of slender form, gray above and white below, with prominent white markings in the wings and in the long tail. The young in first plumage have spotted breasts.

In this form two-thirds of the food is made up of the fruits of palms, wild figs, and other drupes and berries. The animal food includes cutworms, injurious weevils and the mole cricket, so that the species is beneficial in its relation to agriculture.

[*Mimus gilvus gilvus* (Vieillot)]

Guiana Mockingbird

Turdus gilvus Vieillot, Ols. Amer. Sept., 1807, Vol. II, p. 15, Pl. 68 bis.
(Guiana.)

- Mimus gilvus*, Ridgway, Proc. U. S. Nat. Mus., 1884, Vol. VII, p. 172 (St. Thomas, specimen).—Cory, Cat. West Indian Birds, 1892, p. 121 (St. Thomas).—Griscom, Auk, 1921, p. 461 (St. Thomas, doubtful).
Mimus gilvus gilvus, Ridgway, U. S. Nat. Mus., Bull. 50, 1907, Pt. 4, p. 235 (St. Thomas).

In a collection of birds obtained by Benedict and Nye in 1884 at various points on the shores of the Caribbean Sea during a cruise of the Fisheries Steamer *Albatross*, there is a single skin of the present bird marked St. Thomas. Mr. L. Griscom, in announcing a series of *Mimus p. orpheus* from St. Thomas, has cast doubt on this record through information obtained from Dr. Richmond.

On examining the catalog of the collection in question, I find that it includes birds from points within the usual range of *gilvus*. Furthermore, the specimen in question has the original label in a handwriting different from that on other specimens, so that its indication as from St. Thomas is considered erroneous. It would seem to have come from elsewhere and to have been wrongly marked by some person other than the collectors.

The form is included here to call attention to the error, since the bird has no place in the avifauna of the Virgin Islands.]

***Margarops fuscatus fuscatus* (Vieillot)**

Pearly-eyed Thrasher, Zorzál, Zorzál Pardo, Zorzál Negro, Zorzál de los Palmares, Truche

- Turdus fuscatus* Vieillot, Otis. Amer. Sept., 1807, Vol. II, p. 1, Pl. 57 bis. (Santo Domingo; Porto Rico).—Hartlaub, Isis, 1847, p. 611 (listed).
 Thrush, Knox, Hist. Acc. St. Thomas, W. I., 1852, Pt. 220 (St. Thomas).
Merula fuscata, Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 376 (St. Thomas, specimens).
Cichlherminia fuscata, Newton, Ibis, 1859, pp. 141-142 (St. Croix, St. Thomas).—Cory, Auk, 1891, pp. 43, 48 (Porto Rico, St. Croix, Virgin Gorda, St. Thomas, Tortola).—Mortensen, Atlanten, 1909, Vol. VI, No. 66, p. 646 (St. Croix).
Margarops fuscatus, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 595 (Porto Rico, specimens).—Gundlach, Journ. für Ornith., 1874, p. 310; Journ. für Ornith., 1878, pp. 159, 166; Anales Soc. Esp. Hist. Nat., 1878, p. 172 (Quebradillas, Utuado, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 138 (Porto Rico, specimens).—Cory, Auk, 1890, pp. 374, 375 (St. Thomas, Tortola, Virgin Gorda, specimens); Cat. West Indian Birds, 1892, p. 121 (Mona, Porto Rico, St. Thomas, Tortola, Virgin Gorda).—Bowditch, Oölogist, 1900, p. 74 (Vieques); Auk, 1903, p. 20 (Mona, Vieques, Desecheo).—Wetmore, Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 325 (bones from caves near Morovís).
Margarops fuscatus fuscatus, Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 266 (Mona, Porto Rico, St. Thomas, St. John, Tortola, Virgin Gorda).—

Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 89-90 (Porto Rico and smaller islands); Auk, 1916, p. 416 (Vieques, specimens); Auk, 1917, pp. 55, 61 (Culebra, specimens; Louis Peña, Culebrita); Auk, 1918, p. 339-340 (Desecheo, specimens).—Struthers, Auk, 1923, p. 476 (Maricao, Rincón, Mayagüez).—Schmidt, Field Mus. Nat. Hist., Zool. Ser., 1926, Vol. XII, p. 151 (Mona).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 124-125 (Cartagena Lagoon; Ensenada to Cabo Rojo Light-house, Mayagüez).

Mona, Desecheo, Porto Rico, Vieques, Culebra, Culebrita, St. Croix, St. Thomas, St. John, Tortola, Virgin Gorda; resident.

Bowdish reported the pearly-eyed thrasher as more abundant on Mona Island than any other land bird, from August 9 to 21, 1901. Ten skins that he collected for the U. S. National Museum are all in worn plumage. He found the bulky nests of twigs on shelves and crevices in the rocks near small caves.

Bowdish also secured four specimens on Desecheo Island, July 6 and 9, 1900. This thrasher is the only resident land bird now known from this bit of land, where it is so common that, from June 13 to 16, 1912, I estimated that there were perhaps 1200 individuals on the island. In the dense brush it was difficult to see them, but their notes were heard on every hand. Fishermen who visited the island from time to time had made a tiny pool on a broad rock exposure to catch rain water and I saw the thrashers often drinking this supply. I knew of no other available fresh water and wondered how the birds maintained themselves under ordinary circumstances, as in dry seasons they must subsist without a definite water supply. A pair of these birds had built a nest in a crevice in the roof of the little cave that constituted my only shelter, and apparently at this time the female was incubating eggs. I was not able to reach the nest, but it was seemingly a bulky structure, because grass and twigs projected from the openings leading into the crevice in which it was located. Noddy terns fought the two thrashers constantly, but were always worsted in the encounters. At evening the male sang his somewhat labored song from a cactus stalk above the cave entrance, continuing his calls until deep dusk.

On Porto Rico this thrasher is far from abundant in most localities, and from its habits few are seen. I found it at Mameyes, February 9 to 29 (specimens February 12, 21 and 26); Yauco, May 21 (a pair taken); near Guánica, May 24; Aibonito, January 31 (specimens); Caguas, January 11 (specimen); Hacienda Catalina below El Yunque, March 4 and 10. In the U. S. National Museum is a skin taken at Caguas, January 9, 1899, by A. B. Baker. Gundlach reports one taken at Quebradillas in November, and a pair at Utuado in July. Worthing-

ton secured birds for the Carnegie Museum at Santa Isabel on March 22 and at Adjuntas on March 27, 1912. Struthers found them quite common at Maricao, December 29, 1921, and collected two. He reports the species once from Rincón and once near Mayagüez. Mr. F. A. Potts writes me that it is quite plentiful in the upper Toro Negro Valley. I noted many of its bones in cavern material collected by Anthony near Morovís. Danforth has found it fairly common near Cartagena Lagoon, and between Ensenada and Cabo Rojo Lighthouse, and has heard it near Mayagüez.

In habits and appearance the truche resembles the shyer thrushes. It inhabits dense thickets and keeps so well under cover that, except in the drier regions, where the scrub is fairly open, it is seldom seen. The song resembles the syllables *wheur, tel leur, tsee*, given brokenly with many variations; so that, while the notes themselves are pleasing, the whole effect is disconnected and rambling. The birds sing by the hour, and the monotony and persistency of the sounds may in time become unpleasant. In singing they choose elevated perches amid leaves, and rest with wings and tail hanging loosely. At such times with care they may be approached and observed, but at any disturbance they dart at once into thick cover below. The flight is swift and direct, like that of a robin.

In the dense thickets on Vieques Island the pearly-eyed thrasher was common, and from March 16 to April 3, 1912, I secured a series of thirteen, all males. I found that here they had much curiosity, so that it was easy to decoy them from their cover to positions where they could be seen. They were noted especially in dry creek beds and ravines. A breeding male was taken on March 21, but others showed no signs of sexual activity.

The thrashers were common on Culebra Island from April 5 to 21, 1912, where I collected additional specimens. I found them also on Louis Peña and Culebrita islands.

Robert Swift collected this species on St. Thomas for Cassin, and Winch sent specimens from there to Cory. Newton remarks that the species is common on that island, and in the U. S. National Museum there are two skins taken at St. Thomas by F. A. Ober, and a third received from the Academy of Natural Sciences.

The Newtons found the pearly-eyed thrasher common on St. Croix and say that it breeds there from the end of May to the first part of July. The eggs number from four to six and are blue green, deeper in color and larger in size than those of the American robin. Cory received skins from St. Croix, and there are six females in the Museum of Comparative Zoölogy taken on September 15, 1912, by G. K. Noble.

C. S. Winch collected the bird on Tortola and Virgin Gorda, and there are two specimens in the U. S. National Museum obtained by Ober on St. John.

This species feeds mainly on wild drupes and berries, though large insects, spiders, fiddler crabs, tree-toads and lizards are eaten occasionally.

These birds are a little more than eleven inches in length and have a dull-brown plumage, variegated with white below, and a white abdomen. The eye is light in color.

Family TURDIDAE

Mimocichla ardosiacea portoricensis (Bryant)

Porto Rican Thrush, Zorzál, Zorzál Azul, Zorzál de Patas Coloradas

Turdus ardosiaceus portoricensis Bryant, Proc. Boston Soc. Nat. Hist., 1867, Vol. XI, p. 93. (Porto Rico.)

Turdus plumbeus, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 203 (Porto Rico).—Hartlaub, Isis, 1847, p. 611 (listed).—Bello, Zool. Gart., 1871, p. 350 (listed).

Mimocichla plumbea, Taylor, Ibis, 1864, p. 166 (Porto Rico).

Turdus ardosiacea, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 251 (Porto Rico).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 595 (Porto Rico, specimens).

Mimocichla ardosiacea, Gundlach, Journ. für Ornith., 1874, p. 310; Journ. für Ornith., 1878, pp. 159, 165-166; Anales Soc. Esp. Hist. Nat., 1878, p. 171 (Porto Rico, common).—Stahl, Faun. Porto Rico, 1883, pp. 58-59, 138 (Porto Rico, specimens).—Cory, Auk, 1886, p. 6 (Porto Rico); Cat. West Indian Birds, 1892, p. 122 (Porto Rico).—Hartert, Nov. Zool., 1902, Vol. IX, p. 278 (San Juan, specimen).—Bowditch, Auk, 1903, p. 20 (Porto Rico).—Wetmore, Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 326-327 (bones from caves, Morovís and Utuado).

Mimocichla ardosiacea portoricensis, Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 81 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1926, pp. 92-93 (Porto Rico).—Struthers, Auk, 1923, p. 476 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 125-126 (Cartagena Lagoón, Mayagüez).

Porto Rico; fairly common resident.

I found this thrush at Quebradillas, July 2 to 6, 1912; Manatí, July 7 to 11; Trujillo Alto, December 26; Mameyes, February 9 to 29 (specimens); Yabucoa, May 10; Juana Diaz, August 17 to 22; Yauco, May 16 to 28 (specimens); Cabo Rojo, August 24 to 31 (specimens); Mayagüez, June 6; Añasco, June 7 to 8; Aguadilla, June 9 to 21; Maricao, May 29 to June 5 (specimens); Utuado, August 3 to 9 (specimens); Adjuntas, August 10 to 16; Ciales, July 12 to 18 (specimen); Comerio,

July 26 to 31; Cidra, July 30; Caguas, January 5 to 14 (specimen); Aibonito, January 26 to February 5 (specimen); Las Cruces, January 15; Hacienda Catalina below El Yunque, March 2 to 11 (specimens).

The Porto Rican thrush is distributed over the entire island, though it is less common in the dry region of the south coast. The species inhabits dense brush or forest; in the hills it is common in the coffee plantations. Regions of small streams fringed with trees and running through brushy pastures form an especially favorable haunt for these birds. In general appearance they suggest gray-colored robins, but are shyer in habit. At times they run about on the ground in the open, but when frightened take refuge in thickets, and in general remain under cover except when undisturbed. In singing they mount to the top of a tree and perch in the thick leaves, where they utter a song composed of a series of disconnected notes, some of which are quite musical. As a whole, the song is not unpleasing, though repetition causes it to become monotonous. The call-note is a low *whEur-a* like the note of a thrasher. The birds were decoyed readily by "squeaking" or by a whistled imitation of their notes.

The breeding season extends from the end of January to June, varying somewhat in different parts of the island. Near Mameyes in February the birds were seen performing a mating display in which male and female ran about on the ground with heads drawn in and the widely spread tails thrown forward over the back so that the white tips were prominent. Gundlach reports that they lay from three to six eggs, in color greenish white spotted with dark reddish brown. Danforth reports a nest, April 30, 1924, at Mayagüez placed among upright shoots growing from a guanábano tree nine feet from the ground. The nest was built of shreds of bark, fine twigs, a small piece of partly rotted burlap, some string, bits of fern leaf and some feathers, lined with shredded bark. The open cup of the nest contained one egg with "a putty-colored background" mottled with rufous-brown. It measured 33 x 22 mm. I found young birds common in June and July. Taylor has described the bill, eyelids, legs and feet as bright yellow, but this does not hold in a considerable number of specimens that I examined in the flesh, as these parts were near flame scarlet (Ridgway), becoming more orange in June specimens, when the birds were in molt. Birds in full molt were taken at Maricao, June 3, while skins from Ciales, July 15, indicate that the birds were just completing the wing molt.

These thrushes are very handsome, with their dark-gray plumage, white abdomen and white throat streaked heavily with black. The young in juvenal dress has the breast washed with dull buff and barred faintly with dusky.

About two-thirds of the food of this species is composed of drupes of the laurel, moral, wild fig, royal palm and similar fruits of the forest, while in the animal food I found the mole cricket, weevils destructive to cane, cutworms, ants, snails, lizards and tree-toads.

As a species, *Mimocichla ardosiacea* is found on Haiti, Porto Rico and the island of Dominica, indicating that it may have extended through other islands at one time, or that possibly it has been transported by aboriginal man in his wandering. Distinction between the typical form of the island of Haiti and the subspecies *portoricensis* of Porto Rico is very slight. The Porto Rican form in series is faintly more slaty gray above, while the Haitian bird has a bluer tinge. Many from the two regions are indistinguishable in color. In its dimensions the Porto Rican form is slightly larger, the difference being most evident in the bill and tail. Measurements of a series indicate, however, how little difference there is between the two.

	Wing	Tail	Culmen from base	Tarsus
<i>Mimocichla a. ardosiacea</i> :				
Average of 10 males.....	125.5	108.0	23.2	38.9
Average of 9 females.....	121.3	101.0	23.3	38.4
<i>Mimocichla a. portoricensis</i> :				
Average of 15 males.....	129.6	117.5	25.2	39.0
Average of 4 females.....	125.8	112.2	25.0	37.9

[*Hylocichla mustelina* (Gmelin)]

Wood Thrush

Turdus mustelinus Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 817. (New York).—Bello, Zool. Gart., 1871, p. 350 (listed).—Gundlach, Journ. für Ornith., 1874, p. 310; Journ. für Ornith., 1878, pp. 159, 165; Anales Soc. Esp. Hist. Nat., 1878, p. 170 (figured in album of Bello).—Stahl, Faun. Puerto Rico, 1883, p. 58 (listed).—Cory, Cat. West Indian Birds, 1892, p. 122 (Porto Rico).

Hylocichla mustelina, Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 38 (Porto Rico).—Wetmore, U. S. Dept. Agric., Bull. 326, 1916, p. 94 (of doubtful occurrence).

Gundlach found a drawing that he identified as this species in the album of Dr. Bello, who had taken it from a specimen in the collection of Don Celedonio Carbonell. There is no other record for the bird, which is here placed in the hypothetical list, since its occurrence is not sufficiently certain.

The wood thrush migrates from its summer home, in eastern North America, south into eastern Mexico and Central America, and is found casually in Cuba and the Bahamas. It is a bird of plump form with a short tail colored above bright reddish brown on head and back, duller brown on tail, and below creamy white, spotted heavily with black.]

Family VIREONIDAE

Subfamily VIREONINAE

Vireo latimeri Baird

Latimer's Vireo, Julian Chiví

Vireo latimeri Baird, Rev. Amer. Birds, May, 1866, p. 364. (Porto Rico, north side.)

Latimer's Vireo, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).

Vireo latimeri, Bryant, Proc. Boston Soc. Nat. Hist., 1866, p. 252 (listed).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (specimen).—Gundlach, Journ. für Ornith., 1874, p. 310; Journ. für Ornith., 1878, pp. 158, 165; Anales Soc. Esp. Hist. Nat., 1878, p. 167 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 58, 137 (Porto Rico, specimens).—Cory, Auk, 1886, p. 187 (listed); Cat. West Indian Birds, 1892, pp. 116, 132 (listed).—Bowdish, Auk, 1903, p. 16 (San Juan, Mayagüez).—Ridgway, U. S. Nat. Mus. Bull. 50, 1904, Pt. 3, p. 210 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 95-96 (Porto Rico).—Struthers, Auk, 1923, p. 476 (common).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 114-115 (Cartagena and Anegado lagoons, Ensenada, Cabo Rojo Lighthouse, between Utuado and Arecibo).

Porto Rico; fairly common resident.

In 1912 I noted this species at Quebradillas, July 2 to 6 (specimens); Manatí, July 7 to 11 (specimen); Toa Alta, August 2; Bayamón, July 20 to 25; Río Piedras, December 16, 1911, to January 4, 1912 (specimens); Trujillo Alto, December 26, 1911; Patillas, May 13 (specimen); Salinas, April 26 to May 2 (specimens); Juana Diaz, August 17 to 22 (specimens); Yauco, May 16 to 18 (specimen); Cabo Rojo, August 26; Mayagüez, June 6; Maricao, May 29 to June 5 (specimens); Lares, June 18 to July 1 (specimens); Utuado, August 3 to 9; Ciales, July 12 to 18 (specimen); Aibonito, January 26 to February 5 (specimens); Comerio, July 26 to 31; Cayey, January 22 (specimen); and Caguas, January 5 to 14 (specimens). Bowdish secured skins for the U. S. National Museum at Cataño and Mayagüez, and Richmond obtained one at Adjuntas (April 14, 1900). Danforth reports the species near Cartagena and Anegado lagoons, Ensenada, Cabo Rojo Lighthouse and between Utuado and Arecibo.

The present species is another form that is seemingly restricted in range to the western portions of Porto Rico, since to the present time it has not been recorded east of Trujillo Alto, Caguas and Patillas. It is decidedly local in occurrence throughout its range. Latimer's vireo frequents the coffee plantations to some extent, but is most common in the dense brush, matted with creepers, that covers the limestone hills which are a prominent feature of the landscape on the north side of the island. The birds are common in the dry hills of the south coast also, and I found them almost abundant in the forest growth along the Río de la Lapa, back of Salinas. They work industriously through the brush, sometimes high up in the trees, but more often near the ground, searching systematically through the tangles for food. They exhibited some curiosity, and once one came out and scolded with a wrenlike chatter for several minutes, until the brush about me was full of peering grassquits, honey-creepers and spindalis. Females of Latimer's vireo seem to be almost silent, but the males sing incessantly, a sharply accented song, in imitation of which it gets its native name of *julián chi-vi*. There are two distinct strains in this song and the bird may change abruptly from one to the other. The couplets are uttered from twenty-two to twenty-three times a minute and frequently may continue without appreciable break for an hour. The scolding note may be rendered as *chee chee chur chur chur*.

Latimer's vireo nests in April and May. Young birds were seen July 5 following their parents with soft call-notes; Bowdish records immature birds taken in October. Gundlach says that the nest is suspended in a fork of a small branch and is a basket of soft materials, such as plant down, spider web and pliant fibers. He describes the eggs as three in number, white, spotted with lilac and dull brown. In May the males sang constantly, often remaining on one perch for half an hour or so, but by the middle of June they were mainly silent.

The bulk of the food of Latimer's vireo consists of small insects and includes many little beetles, true bugs and even the nymphs of the mole cricket. About one-eighth of its sustenance comes from small wild berries and fruits, such as those of the camacéy (*Miconia prasina*) and espino. Most of the vegetable food is eaten in autumn.

Latimer's vireo is slightly less than five inches in length, but is plump and robust. The back is bright olive-green, the crown grayish, throat whitish and breast and underparts yellow.

Vireo olivaceus olivaceus (Linnaeus)

Jamaican Vireo, Bien-te-veo

- Muscicapa olivacea* Linnaeus, Syst. Nat., Ed. 12, 1766, Vol. I, p. 327. (Jamaica.)
- Sylvicola altiloqua*, Hartlaub, Isis, 1874, p. 611 (listed).
- Vireo altiloquus*, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 595 (Porto Rico, specimens).—Bello, Zoöl. Gart., 1871, p. 349 (listed).
- Phyllomanes calidris*, Gundlach, Journ. für Ornith., 1874, p. 310; Journ. für Ornith., 1878, pp. 158, 165; Anales Soc. Esp. Hist. Nat., 1878, p. 168 (Porto Rico, abundant).—Stahl, Faun. Puerto Rico, 1883, p. 58 (Porto Rico, specimens); Ornis, 1887, pp. 451, 453 (migrant).
- Vireo calidris*, Cory, Cat. West Indian Birds, 1892, pp. 115, 152-153 (Porto Rico, St. Croix).—Böwdish, Oölogist, 1900, p. 74 (Vieques); Auk, 1903, p. 16 (Porto Rico, abundant).
- Vireosylva altiloqua*, Newton, Ibis, 1859, p. 145 (St. Croix).—Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, pp. 375-376 (St. Thomas, specimens).—Taylor, Ibis, 1864, p. 166 (Porto Rico, common).
- Vireosylva calidris calidris*, Ridgway, U. S. Nat. Mus. Bull. 50, 1904, Pt. 3, p. 138 (Porto Rico, St. Thomas, St. Croix).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 97-98 (Porto Rico); Auk, 1916, p. 416 (Vieques, specimens); Auk, 1917, pp. 54, 61 (Louis Peña, Culebrita).—Struthers, Auk, 1923, p. 476 (Porto Rico, summer).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 113-114 (Porto Rico, records).
- Vireosylva calidris*, Wetmore, Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 328-329 (bones from cave deposits, near Morovís).

Porto Rico, Vieques, Louis Peña, Culebrita, St. Croix, St. Thomas; a summer visitant that comes to breed, but spends the winter elsewhere.

In Porto Rico the Jamaican vireo is a common summer visitant that I recorded as follows: Quebradillas, July 2 to 6; Manatí, July 7 to 11; Toa Alta, August 2; Bayamón, July 20 to 25; Mameyes, February 14 to 29; Yabucoa, May 3 to 10; Maunabo, May 11; Patillas, May 12 to 13; Salinas, April 26 to May 2; Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Mayagüez, June 6; Añasco, June 7 and 8; Aguadilla, June 9 to 12; Maricao, May 29 to June 5; Lares, June 18 to July 1; Utuado, August 3 to 9; Adjuntas, August 10 to 16; Ciales, July 12 to 18; Comerio, July 26 to 31; Aibonito, January 26 to February 5; Hacienda Catalina, below El Yunque, March 2 to 11.

The species is migrant, coming in February and leaving the island in September. I saw the first one near Mameyes, February 14, 1912, and immediately after that the species became common. Struthers reports the earliest arrival as February 12, 1921. The birds seem to arrive in a group and rapidly cover the entire island. Gundlach says that they come on February 14, while Stahl in 1887 noted one on February 5.

which is the earliest date of arrival known at present. In the U. S. National Museum is a specimen taken February 13, 1899, at Hucares, by Mr. A. B. Baker. The following year Richmond collected one on the lower slopes of El Yunque, February 22.

The Jamaican vireo is found throughout Porto Rico wherever there are trees, and, though most common in the forested hills, is found in brushy thickets in pastures, or in shade trees about houses. The coffee plantations, with their extensive stretches of tall trees to protect the coffee from the sun, are especially favorable to them.

In the spring of 1912 males seemed to arrive first, as no female was actually taken until April 11, after which this sex was common. On March 9, near the Hacienda Catalina, there was a wave of migration on the part of the vireos, for in early morning the coffee plantations were full of their songs, whereas next day they were gone. In fall these birds had completed the molt by the first week in August and were restless, working rapidly through the tops of the trees. By August 16 their numbers had suddenly decreased, and after that they were evidently migrating, the last one being observed on August 31 at Cabo Rojo. Danforth records the last at Mayagüez, September 8, 1924. Gundlach reports them as leaving in August, while Stahl says that they are present until September. Migration among such birds as this vireo and the martin that nest in Porto Rico and then migrate elsewhere to winter is difficult to explain. Climate can hardly account for it, as the seasons in Porto Rico are fairly uniform. It may possibly be due to an instinct to withdraw, after breeding, to the ancestral home for winter. Two specimens have been recorded from Masinga Vieja, in the Santa Marta region of Colombia, August 19 and September 7, which indicates that they winter in northern South America.²²

The Jamaican vireo is slow and leisurely in habit, examining carefully twigs and leaves for food. It peers about in characteristic vireo fashion, sometimes pausing to sing for several minutes. It has little fear of man. The song, given constantly through the day in the breeding season, is a series of couplets closely resembling the song of the red-eyed vireo. It also utters the usual scolding note of vireos of this type.

The breeding season begins early in May and lasts through June. I found no nests, but at Lares, June 29, a boy brought me a nestling and described the nest as built in a banana plant. A juvenile female in the U. S. National Museum was taken at Mayagüez, May 30, 1901, by Mr. Bowdish.

Bowdish describes a nest found, May 1, 1900, near Aguadilla as a

²² See Todd and Carriker, *Ann. Carnegie Mus.*, 1922, Vol. XIV, pp. 434-435.

well-made basket hung in the fork of a limb seven feet from the ground. It was made of fibers and cottony substance and was very handsome. Another nest found on June 9 contained two eggs similar to those of *Vireo olivaceus*. These eggs, now in the U. S. National Museum, are dull white in color. One is spotted sparingly with small spots of blackish brown, while the other is unmarked. They measure 21.8 x 15.9 mm. and 21.7 x 16.7 mm., respectively. A third nest, suspended over a road, was twelve feet from the ground. Danforth reports a nest containing three eggs at Cartagena Lagoon on July 2, 1924. Throughout July I found young birds common, either shifting for themselves or still following their parents with soft insistent calls, while the adults answered with low plaintive notes. Two seemed to be the usual number in a brood. During the breeding season each pair has a very circumscribed range, as may be determined from the singing of the male hour after hour throughout the day from the same group of trees. In August they sang seldom. Because of their leisurely movement, it is often difficult to see them amid thick leaves, particularly when these are disturbed by wind.

The iris of this species is rather a bright reddish brown in color. I found bones of this species in material from cave deposits near Morovís.

Bowditch recorded the Jamaican bird on Vieques Island, and from March 16 to April 3 I found it fairly common there and secured specimens. It seemed local in distribution. I observed it in several localities on the south coast, but on the north side of the island encountered it only along one small gully.

One specimen was taken on Louis Peña, April 11, where I found several vireos in dense mangroves, and they were observed on Culebrita, April 15. None were found on Culebra Island proper, though they undoubtedly occur there.

The Newtons report them as common on St. Croix, but very local in occurrence, ranging mainly in the south part of the island. A nest found on June 5, 1858, in a manchineel contained three eggs. They stated that the bird was undoubtedly resident, and there is little doubt that it is migrant throughout its breeding range. There are two males in the Museum of Comparative Zoölogy taken on St. Croix, June 19 and 21, 1914, by G. K. Noble.

Cassin reports several specimens forwarded from St. Thomas by Robert Swift. The bird has not yet been reported from the other islands considered in this report.

Bangs and Penard (Bull. Mus. Comp. Zoöl., Vol. 67, 1925, pp. 205-206) have shown that the specific name *olivaceus* must be transferred to

the present species, replacing the current appellation *calidris*, while the red-eyed viro formerly called *olivaceus* will become *Vireo virescens*.

A large series that I secured in Porto Rico are all referable to the present form, and I see no distinction between these and skins from Jamaica. It is probable that *Vireo olivaceus barbatula*, which nests in Cuba, Florida and the Bahamas, may come occasionally to Porto Rico in migration, for it also is migrant and winters in Colombia, but it has not yet been taken. It is distinguished from typical *olivaceus* by whiter breast, greener back, grayer crown, lighter, more whitish superciliary, and paler sides of head.

The Jamaican vireo is a bird of slender form, greenish above, with duller, grayer head, whitish below with a yellowish green wash on sides and under tail coverts, a prominent light superciliary and a blackish malar stripe. It is about six inches in length.

The food of this vireo is made up of almost equal parts of animal and vegetable matter. Small Orthoptera, bugs, weevils, other beetles, quantities of caterpillars, spiders and little tree-toads were found in the animal food. Small fruits of the wild fig, espino (*Xanthoxylum*), guaraguou (*Guarea trichilioides*), adelia (*Adelia*) and ají (*Capsicum*) are indicative of its preferences among wild fruits and berries. Indigestible seeds or hard fragments of insects are regurgitated after digestion of the softer portions has taken place.

[*Vireo virescens* (Vieillot)]

Red-eyed Vireo

Vireo virescens Vieillot, Ois. Amer. Sept., 1807, Vol. I, p. 84, Pl. 83. (Pennsylvania.)

Vireo olivaceus, Bello, Zool. Gart., 1871, p. 390 (listed).—Cory, Auk, 1886, p. 190 (Porto Rico); Cat. West Indian Birds, 1892, p. 116 (Porto Rico).

Phyllomanes olivaceus, Gundlach, Journ. für Ornith., 1874, p. 310; Journ. für Ornith., 1878, p. 158; Anales Soc. Esp. Hist. Nat., 1878, p. 169 (figured in album of Bello).

Vireosylva olivacea, Ridgway, U. S. Nat. Mus. Bull. 50, 1904, Pt. 3, p. 148 (Porto Rico?).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 96 (hypothetical).

The red-eyed vireo was recorded by Gundlach on the basis of a drawing made by Bello from a specimen seen in the collection of Don Celedonio Carbonell, of Cabo Rojo. This record is considered indefinite and the species is here included as hypothetical. It is distinguished from the Jamaican vireo by the lack of the dusky streak on the malar region.]

Family COEREBIDAE

Subfamily COEREBINAE

Coereba portoricensis portoricensis (Bryant)

Porto Rican Honey-creeper, Reinita, Reina, Gusanero

- Certhiola flaveola portoricensis* Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 252. (Northern side of Porto Rico.)
- Porto Rican Honey Creeper, Danforth, Oölogist, 1922, p. 10 (Porto Rico); Bird-Lore, 1922, p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).
- Certhia flaveola* Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto Ricco, 1810, Vol. II, pp. 205, 206 (listed).
- Nectarinia flaveola*, Moritz, Wiegmann Arch. Naturg., 1836, p. 387 (listed).—Bello, Zool. Gart., 1871, p. 349 (listed).
- Certhiola flaveola*, Taylor, Ibis, 1864, p. 166 (Porto Rico).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 598 (specimens).
- Certhiola portoricensis*, Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 179-180; Anales Soc. Esp. Hist. Nat., 1878, p. 216 (abundant).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 144 (specimens).—Cory, Auk, 1886, p. 48 (part, Porto Rico); Auk, 1891, p. 38 (part, Porto Rico); Cat. West Indian Birds, 1892, p. 116 (part, Porto Rico); Auk, 1892, p. 229 (specimens).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 115-116 (Porto Rico, habits).
- Coereba portoricensis*, Bowditch, Auk, 1903, p. 17 (habits).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 413 (part, Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, 109-111 (habits, economic status); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 329-330 (bone from cavern; Morovís).—Struthers, Auk, 1923, p. 477 (habits, nesting).

Porto Rico. The most abundant and widely distributed species of bird.

The honey-creeper is without question the most abundant bird of the island, as it is found wherever there is cover for it: in mangroves lining the lagoons and bays, along maya hedges through the cane-fields, in mangó trees in pastures, in coffee plantations, thickets and forests. Seemingly it is able to adapt itself to all conditions. It is the only common bird of the dense, humid rain forests that clothe the higher slopes of El Yunque, and it is equally common in arid districts on the dry southern coast where rains come seldom. The species is one of the few common birds of the coffee plantations and outnumbers all other birds to be found in such situations. It not infrequently penetrates the cane-fields from the shelter of the maya hedges. Honey-creeper are tame and trusting, coming about houses to search the eaves for spiders and even entering open doors and windows familiarly. In the little cafetins in the barrios it is a common practice to place syrup for them.

in a little dish on the counter. A pair of honey-creepers with a family near by will visit this daily, bringing their young with them as soon as they are out of the nest in order to feed them. In country hotels it is not unusual to have a honey-creeper fly in at meal time to perch on the edge of the sugar bowl and help itself, unmindful of guests at the table. On one occasion, while I was shaking down some wild oranges, a bird, attracted by the motion of the limbs, alighted in the tree just above my head and refused to leave, though I was jarring the tree violently.

The song of the honey-creeper is heard incessantly through the day, an insect-like trill that may be likened to the syllables *zee-e-e-e sweets se tee*, the first part given slowly, in a thin, high tone, and the last more rapidly. The call-note is a sharp, chipping note, heard usually when the birds are alarmed about their nests. Sometimes, while singing, the male remains for several minutes on one perch, but usually the song is given while he is hunting for food. In the dark forests on the upper slopes of El Yunque, the note of the honey-creeper was the only song heard, though in the obscure light that filtered through the thickly interlaced branches the birds were seldom seen. Nothing appears to daunt them. After a cloudburst near Adjuntas, when torrents of rain were accompanied by violent, shifting winds, honey-creepers began singing cheerfully the instant that the heaviest part of the downpour was over. The young birds sing as soon as they are fully feathered, and frequently are breeding before they have lost the juvenal plumage, at which time they cannot be more than six or seven months old.

The nesting season appears to extend without definite break throughout the year, though occupied nests are most abundant from February to June. Several broods are raised; how many can be told only by extended observations on one pair. The nests are round, globular affairs, placed in a semipendant fashion at the tips of limbs, from five to thirty feet from the ground. They are built of weeds, leaves and grasses, lined with finer material. The opening is always below, so that the birds go in from underneath. Dr. George N. Walcott, under date of May 30, 1920, sent me a nest found near Point Cangrejos that contained in its material a large number of egg clusters of a spider of the genus *Gasteracantha*.

Both sexes assist in building, bring straws and other material and fix them in place, at first forming merely a rounded mass, with a semblance of the opening in one side, which later is molded into its proper form. Although the male is allowed to assist, he brings material only when the female is absent, for when she catches him in the nest, she immediately drives him out. The nests, when empty, are used as sleeping quarters. These birds sleep late, not coming out in the morning until

half an hour after other birds have become active. The usual number of young is two or three. The nests are often built without attempt at concealment. They should be protected rigidly, as hundreds of eggs are destroyed wantonly by boys.

There are three sets of eggs of the honey-creeper in the U. S. National Museum, the first consisting of one egg taken at Luquillo, Porto Rico, March 3, 1900, by C. W. Richmond, the second of two eggs, secured at Fajardo, March 13, 1900, by the same collector, and the third of three eggs collected at Mayagüez, Porto Rico, by B. S. Bowdish on May 25, 1901. These have the ground color white. The set of two eggs is marked with fairly well-defined fine spots of army and natal brown, distributed over the entire egg, but most abundant, almost confluent, at the large end. The remaining eggs have the brown markings present more as a wash that is fainter, less defined into spots, and in two forms a wreath about the larger end. The single egg has little of the ground color visible through the brown. The eggs of these sets measure 18.5 x 12.4 mm.; 17.3 x 12.5 mm. and 17.2 x 12.3 mm.; 18.2 x 13.4 mm., 17.0 x 13.3 mm. and 17.2 x 13.6 mm.

In their quest for food, honey-creepers search all flowering plants, but of these the molinillo (*Leonotis*) is perhaps visited most frequently. The birds cling to the rounded flower heads and probe each one in turn. The muñeco (*Cordia collococca*) and bucare (*Erythrina*) when in blossom are also a great attraction. When the flower of the banana opens, it contains a great deal of nectar and is visited repeatedly. Honey-creepers, it is said, occasionally pierce ripe bananas; but, as the bunches are cut for human consumption while green, the birds do not deprive man of the fruits they injure. A honey-creeper that I shot near Cayey, January 17, 1912, had the throat filled with the pulp of red raspberries (*Rubus rosifolius*) and it was not unusual to find clear nectar in the esophagus. Near Río Piedras one visited a ripe guanábano (*Anona muricata*) that had been torn open by a spindalis, and ate for nearly five minutes, hanging head down from a twig above and pulling and nibbling at the inside of the fruit. Undamaged fruit in the same tree was not touched, even after the guanábano that was already open was removed. There is some complaint among fruit-growers that this species pricks ripe oranges and destroys them, but personally I observed nothing of the kind, the nearest approach to it being when fully ripe fruit had been opened by other agencies and the honey-creepers thereupon came to sip the juice. Birds taken in the citrus groves were invariably feeding on insects. A large part of the food of the honey-creeper is composed of small spiders and tiny insects, such as lantern flies, small beetles, cater-

pillars, flies and Hymenoptera. The species seems in general beneficial to agriculture.

The reinita is so universally known to Porto Ricans that a description seems almost superfluous. It is a tiny bird, only four and one-half inches long, with curved bill, yellow breast and rump, gray throat, sooty black upper surface, with a white spot on the wing and a white line over the eye. The young are duller in color and have the superciliary stripe dull yellow.

The type specimen of this bird in the U. S. National Museum, taken by George Latimer, is marked "Porto Rico, N. side."

***Coereba portoricensis sancti-thomae* (Sundevall)**

Virgin Island Honey-Creeper, Sugar-bird

Certhiola Sancti Thomae Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 621. (St. Thomas.)

Certhiola sancti-thomae Ridgway, Proc. U. S. Nat. Mus., 1885, p. 28. (Described as new from St. Thomas.)

Certhiola flaveola, Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 377 (St. Thomas, specimens).

Certhiola portoricensis, Ridgway, Proc. U. S. Nat. Mus., 1884, p. 172 (St. Thomas, specimens).—Cory, Auk, 1886, p. 48 (part, St. Thomas).—Nicol, Ibis, 1904, p. 576 (St. Thomas, specimen).

Coereba dominicensis, Cory, Auk, 1890, p. 374 (Anegada).

Coereba portoricensis, Cory, Auk, 1890, pp. 374, 375 (St. Thomas, Anegada, Tortola, Virgin Gorda, Culebra); Auk, 1891, p. 38 (part, Culebra, Anegada, Tortola, Virgin Gorda, St. Thomas, St. John); Cat. West Indian Birds, 1892, p. 116 (part, Culebra, Anegada, Tortola, Virgin Gorda, St. Thomas, St. John).—Bowditch, Oölogist, 1900, p. 74 (Vieques).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 413 (part, Vieques, Culebra, Anegada, Tortola, Virgin Gorda, St. Thomas, St. John).—Auk, 1916, pp. 418-419 (Vieques, specimens); Auk, 1917, pp. 55, 62 (Culebra, Culebrita, Louis Peña, specimens).

Vieques, Culebra, Culebrita, Louis Peña, St. Thomas, St. John, Virgin Gorda, Tortola, Anegada; resident.

On careful comparison of a large series I find that the honey-creeper of the Virgin Islands (except St. Croix, which is inhabited by a distinct species, *Coereba newtoni*) is distinguished from the bird of Porto Rico by the brighter, clearer yellow of the under surface and the paler coloration of the flanks. The difference is constant in a large series from Vieques and Culebra and in a smaller number from St. Thomas and St. John. It is assumed to hold for individuals from Virgin Gorda, Tortola and Anegada, from which I have not seen specimens.

Mr. Ridgway noted this distinction in 1885, and curiously enough

described the bird from Saint Thomas as *C. sancti-thomae*, not recognizing that Sundevall earlier had bestowed upon it the same name. Lowe²³ has also observed differences in color between Porto Rican and Virgin Island birds, but did not recognize them by name. The Virgin Island form is easily evident and merits separation.

On Vieques Island the honey-creeper is common, but is relatively less abundant than on Porto Rico. It is found in forests, through scattered groves of trees, or in maya hedges bordering cane-fields, but is rarely associated in numbers. It is common about the flowers of the muñeco (*Cordia collococca*), from whose blossoms it obtains nectar, small spiders and insects. In 1912 it came familiarly about houses, and in the little hotel where I stopped in Isabel II one entered daily to search the blossoms of cut flowers placed in vases in the parlor. A large mirror was a never-ending attraction and the bird frequently perched before it, puzzled by its own reflection and that of the room beyond, which it always attempted to enter. As it fluttered before the glass, the bird on the opposite side rose always to meet it, and after several attempts to evade the reflection, first on one side and then on the other, it would drop down, baffled, to its perch before the glass and scold its image sharply with quickly flitting wings. From March 16 to April 3 several young in juvenile plumage were taken, while adults were preparing for another brood.

On Culebra Island the honey-creeper was also common wherever there was cover for it. In April it was busily engaged in nest-building, apparently beginning a new breeding season. It was seen on Louis Peña and Culebrita islands, and on the latter there was a nest constructed of cotton which was highly conspicuous because of the white material.

In the U. S. National Museum there are specimens taken on St. Thomas by Robert Swift and by Benedict and Nye. One of the latter is the type of Ridgway's *Certhiola sanctae-thomae*. Nicoll shot specimens here between February 21 and 24, 1904.

Two taken on St. John by F. A. Ober are also in the U. S. National Museum, and Cory had specimens from Tortola, Virgin Gorda and Anegada collected by Winch.

Coereba newtoni (Baird)

St. Croix Honey-Creeper, Sugarbird

Certhiola newtoni Baird, Amer. Nat., 1873, Vol. VII, p. 611. (St. Croix.)

Nicoll, Ibis, 1904, p. 575. (St. Croix.)

Certhiola flaveola, Newton, Ibis, 1859, pp. 67-69 (St. Croix, common).—Mortensen, Atlanten, June, 1909, Vol. VI, No. 66, pp. 644-645 (St. Croix).

²³ Ibis, 1912, pp. 512-513.

Coereba newtoni, Cory, Auk, 1891, pp. 39, 48 (St. Croix); Cat. West Indian Birds, 1892, p. 116 (St. Croix).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 417 (St. Croix).

St. Croix; said to be fairly common.

The Newtons state that the honey-creeper of St. Croix breeds from March to August. Nicoll found it fairly common in February, 1904, but reports that it frequented thick brush, where it was difficult to locate. Mortensen says that it is known as the sugar-bird from its habit of entering refinery buildings to eat sugar.

There are thirteen specimens in the collection of the Museum of Comparative Zoölogy, taken June 19 and September 14 and 15, 1914, by G. K. Noble.

This form is notable for being confined to the single island of St. Croix. It is very similar to the Porto Rican bird, but is distinguished by darker throat and somewhat lighter yellow of breast.

Family MNIOTILTIDAE

Mniotilta varia (Linnaeus)

Black and White Warbler, Reinita, Gusanero, Trepadora

Motacilla varia Linnaeus, Syst. Nat., ed. 12, 1766, Vol. I, p. 333. (Santo Domingo.)

Black and White Warbler, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez); Oölogist, 1922, pp. 11, 177-178 (western Porto Rico); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Mniotilta varia, Newton, Ibis, 1859, p. 143 (St. Croix, winter).—Bello, Zool. Gart., 1871, p. 349 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 177 (Porto Rico, winter).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (Porto Rico, specimen); Ornis, 1887, p. 451 (migration).—Cory, Auk, 1891, p. 48 (St. Croix); Cat. West Indian Birds, 1892, p. 117 (Mona, Porto Rico, St. Croix).—Bowditch, Oölogist, 1900, p. 74 (Vieques); Auk, 1903, p. 17 (Porto Rico, Vieques).—Nicoll, Ibis, 1904, pp. 575, 576 (St. Croix, St. Thomas, specimens).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 108 (Porto Rico, Vieques, Culebra); Auk, 1916, p. 418 (Vieques); Auk, 1917, p. 62 (Culebra, specimen); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 329 (bone from cave near Morovís).—Struthers, Auk, 1923, p. 477 (Porto Rico, winter).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 116 (Cartagena Lagoon, Mayagüez).

Mona, Porto Rico, Vieques, Culebra, St. Croix, St. Thomas; winter visitant.

The black and white warbler is listed from Mona by Cory, presumably on the basis of record made by W. W. Brown, Jr., though Cory makes no statement regarding it.

On Porto Rico this species is a regular winter visitant that at times, usually during migration, appears quite common. The species is easily distinguished from other warblers by its plain black and white plumage, in which the color is arranged in longitudinal streaks, and by its habit of creeping quickly up the trunks or around and under the limbs of trees. It is found universally wherever there is tree or forest growth.

In 1912 I observed it at Río Piedras, December 16, 1911, to January 4, 1912 (specimen, December 21); Mameyes, February 23; Fajardo, December 30, 1911 (specimen); Salinas, April 30; Caguas, one between January 5 and 14, 1912; Cayey, January 23; and Aibonito, January 26, 27 (specimen), 30 (specimen), and February 1. Bowdish found it at Mayagüez, October 10, 1901, and Danforth notes it October 12, 1924. Both Stahl and Struthers have recorded it as arriving from the north in August. Richmond reported it from Arecibo, April 1, and from Utuado, April 7 and 11, 1900. F. A. Potts, writing from Central Aguirre, noted the last on April 6, 1921, while Struthers in western Porto Rico observed it until April 18 of the same year. Danforth reported the last in 1922 as April 29 (which coincides closely with my date of April 30, 1912, at Salinas) and the last in 1924 as April 21.

I identified a bone of this species from cavern deposits near Morovís.

On Vieques Island Bowdish secured one on January 30, 1900. In 1912 I saw one near Porto Ferro on March 27, and again on March 29. On Culebra Island I shot one from a flock of warblers in migration on April 9, and recorded another on April 12. The Newtons report the species in winter on St. Croix; Cory had specimens from that island, and Nicoll records two taken there between February 19 and 21, 1904, when he reports the species as common. There are skins in the U. S. National Museum from St. Thomas secured by Robert Swift and F. A. Ober, and Nicoll collected the bird there between February 21 and 24, 1904.

***Compsothlypis americana pusilla* (Wilson)**

Northern Parula Warbler, Reinita, Pecho de Oro

Sylvia pusilla Wilson, Amer. Ornith., 1811, Vol. IV, p. 71, Pl. 28, Fig. 3. (Eastern Pennsylvania.)

Northern Parula Warbler, Danforth, Oölogist, 1922, pp. 11, 178 (western Porto Rico); Bird-Lore, 1922, p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Motacilla Ludoviciana, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 205, 269 (listed).

Sylvicola americana, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 250 (listed).

- Parula americana*, Newton, Ibis, 1859, p. 143 (St. Croix).—Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 376 (St. Thomas, specimen). Bello, Zool. Gart., 1871, p. 349 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 161; Anales Soc. Esp. Hist. Nat., 1878, p. 176 (Porto Rico, winter).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (Porto Rico, specimens); Ornis, 1887, pp. 449, 451 (arrive in August).—Nicoll, Ibis, 1904, pp. 575, 576 (St. Croix, St. Thomas, specimens).
- Compsothlypis americana*, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (Porto Rico, specimens).—Cory, Auk, 1890, pp. 374, 375 (St. Thomas, Tortola, Virgin Gorda, specimens).—Auk, 1891, p. 48 (St. Croix); Cat. West Indian Birds, 1892, p. 116 (Porto Rico, St. Thomas, Tortola, Virgin Gorda, St. Croix).—Bowditch, Oölogist, 1900, p. 74 (Vieques); Auk, 1903, p. 18 (Porto Rico, Vieques).
- Compsothlypis americana usneae*, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 107-108 (Porto Rico, specimens); Auk, 1916, p. 418 (Vieques, specimens); Auk, 1917, pp. 55, 62 (Culebra, Louis Peña, specimens).—Struthers, Auk, 1923, p. 477 (Porto Rico, migration records).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 116-117 (western Porto Rico).

Porto Rico, Vieques, Culebra, Louis Peña, St. Croix, St. Thomas, Tortola, Virgin Gorda; winter visitant, common.

The parula warbler is the most common of the migrant warblers that come to Porto Rico and the Virgin Islands for the period of the northern winter. Stahl reported that this form arrives in Porto Rico in August, which coincides with the earliest authentic date available, that of August 10, 1921, recorded by Struthers. Richmond, in 1900, noted it at Utuado, April 11, and Ponce, April 16. I shot a specimen on the Río de la Lapa near Salinas, April 30, 1912. F. A. Potts writes me that he saw the bird last May 2, and Struthers observed it until May 7, 1921. Danforth reports the last at Mayagüez on April 15, 1922, and the last at Cartagena Lagoon on May 2, 1924. The bird is universally distributed wherever there are trees, from the mangrove swamps of the coast to the forests at the highest altitudes. The shade of mangó trees growing in the open is attractive to them. In my own field work I found it at Río Piedras from December 16, 1911, to January 4, 1912 (specimens); Mameyes, February 9 to 29 (specimens); Salinas, April 30 (specimens); Aibonito, January 26 to February 5 (specimens); Cayey, January 15 to 25 (specimens); Caguas, January 11 (specimen); and El Yunque de Luquillo, March 2 to 11 (specimens). On March 8 one was observed at 3000 feet elevation on El Yunque.

In the forests parula warblers are the most vociferous members of the groups of birds that gather to scold an intruder, and are always active, working quickly through the limbs in their incessant search for food.

Migratory movement was evident among them as early as February 14. After this date they were very restless, especially during the early morning, and there was a tendency among them while feeding to travel from east to west. In March and April I observed distinct waves of migration among them. By the last of March all were in fresh plumage, the feathers showing a beautiful sheen. After the beginning of April males began their songs and from then on sang continually, sometimes in the merest whisper, but usually as loudly as in the North.

On Vieques Island parula warblers are common winter visitants. Bowditch reported them in 1900, and Richmond recorded them there on March 24, 1900. During my stay there, from March 16 to April 3, 1912, spring migration was in force, so that parula warblers, passing through the island from east to west towards Porto Rico, outnumbered all others of their family. The blossoms of the muñeco tree (*Cordia collococca*), with their hosts of tiny, buzzing insects, were especially attractive to them at this season. The birds remained common here until my departure.

On Culebra they were also abundant from April 5 to 19, exceeding in numbers other migrant warblers and appearing in little waves of migration, so that their numbers fluctuated from day to day. They began to sing on April 11. Two were taken on April 9, and the birds were last observed on April 19, two days previous to my departure. I found them on Louis Peña Island on April 11.

The Newtons found the parula warbler in winter on St. Croix, and noted that most of these birds departed in March, though one was seen on May 6, 1858. Cory recorded it from St. Croix in 1891, and Nicoll shot an adult male there between February 19 and 21, 1904, when he found the species common. It was forwarded from St. Thomas to Cassin by Robert Swift, and there are skins from the same source in the U. S. National Museum. Cory received it from Winch, and Nicoll collected it on St. Thomas between February 21 and 24, 1904.

Winch secured specimens, reported by Cory, on Tortola and Virgin Gorda. It has not yet been secured on St. John, but must occur there.

The parula warbler is less than five inches in length, with the upper parts grayish blue and a greenish yellow patch on the back. The throat and breast are yellow with a blackish band, sometimes mingled with rufous, the abdomen is white and there are two white wing bars.

***Dendroica tigrina* (Gmelin)**

Cape May Warbler, Reinita, Bijirita de Costa

Motacilla tigrina, Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 985. (Canada.)
Cape May Warbler, Danforth, Oölogist, 1922, p. 178 (western Porto Rico).

- Perissoglossa tigrina*, Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 178 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (Porto Rico, specimen).
- Dendroica tigrina*, Newton, Ibis, 1859, p. 144 (St. Croix).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (Porto Rico, specimens).—Cory, Auk, 1891, p. 48 (St. Croix, specimen); Cat. West Indian Birds, 1892, p. 117 (Porto Rico, St. Croix).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 538 (Porto Rico, St. Croix).—Bowditch, Auk, 1903, p. 18 (Mayagüez); Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 105 (Porto Rico, Vieques); Auk, 1917, p. 418 (Vieques, seen).—Struthers, Auk, 1923, p. 477 (Mayagüez, Boquerón).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 117 (Cartagena Lagoon, Mayagüez).

Porto Rico, Vieques, St. Croix, St. Thomas; uncommon winter visitant.

The Cape May warbler may at times be common in Porto Rico, as Sundevall notes that he received a number from Hjalmarson, and Gundlach reports it as seen often in winter. Bowditch noted one in Mayagüez, October 30, 1900, and Danforth has said that it is a rare winter visitant in western Porto Rico. He observed one at Cartagena Lagoon on April 8, 1922, and others at Mayagüez, February 19 and March 17, 1922. Struthers recorded it on January 14, 20 and 22 and November 24, 1921, near Mayagüez, and on February 26, 1922, south of Boquerón. There are two specimens in the Carnegie Museum taken at Guayama, March 7 and 9, 1912, by W. W. Worthington. Potts saw one at Santa Rita, near Guánica, January 29, 1924.

On April 4, 1912, I saw a fine male of this species in a flame-tree in the town of Isabel II, Vieques. It was leisurely in its movements, so that I was able to watch it at short range for several minutes.

The Newtons found it an uncommon winter visitant in St. Croix, and Cory has recorded a specimen sent to him from that island. There is a skin in the U. S. National Museum collected on St. Thomas by Robert Swift.

The male is easily told from other warblers by the chestnut-brown patch on the cheeks. Females and young are identified with some difficulty by one not an expert.

***Dendroica petechia cruciana* Sundevall**

Porto Rican Golden Warbler, Yellow Neck, Wild Canary, Canario, Canario del Manglar, Reñita

- Dendroica petechia cruciana* Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 608. (St. Croix.)
- Motacilla aestiva*, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix, et Porto-Ricco, 1810, Vol. II, pp. 205, 268-269 (Porto Rico).

- Matacella pensilis*, Knox, Hist. Acc. St. Thomas, W. I., 1852, p. 220 (St. Thomas).
- Dendroica aestiva*, Newton, Ibis, 1859, p. 143 (St. Croix, resident).—Bello, Zool. Gart., 1871, p. 349 (listed).—Mortensen, Atlanten, June, 1909, Vol. VI, No. 66, p. 646 (St. Croix).
- Dendroica petechia*, Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 376 (St. Thomas, specimens).—Taylor, Ibis, 1864, p. 166 (Porto Rico, specimens).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 182 (Porto Rico, common resident).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (Porto Rico); Ornis, 1887, p. 451 (resident).—Ridgway, Proc. U. S. Nat. Mus., 1884, p. 172 (St. Thomas, specimen).
- Dendroica ruficapilla*, Cory, Auk, 1890, pp. 374, 375 (Anegada, Virgin Gorda, specimens); Auk, 1891, p. 48 (St. Croix).
- Dendroica petechia ruficapilla*, Cory, Auk, 1886, p. 31 (Porto Rico, St. Thomas); Cat. West Indian Birds, 1892, p. 118 (Porto Rico, St. Thomas, Virgin Gorda, Anegada, St. Croix).
- Dendroica barthelemica*, Nicoll, Ibis, 1904, pp. 575, 576 (St. Thomas, specimens).
- Dendroica petechia portoricensis* Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (nomen nudum).
- Dendroica petechia barthelemica*, Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 519 (Porto Rico, Vieques, St. Thomas, Virgin Gorda, Anegada, St. Croix).—Bowditch, Auk, 1903, p. 18 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 105-106 (Porto Rico); Auk, 1916, p. 418 (Vieques, specimens); Auk, 1917, pp. 55, 62 (Culebra, Culebrita, Louis Peña, specimens).—Struthers, Auk, 1923, p. 477 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 117-119, Fig. 44 (Porto Rico, habits).

Porto Rico, Vieques, Culebra, Culebrita, Louis Peña, St. Croix, St. Thomas, Virgin Gorda, Anegada; resident.

During my field work the golden warbler was noted as follows: Quebradillas, July 2 to 6, 1912; Manatí, July 7 to 11 (specimens); Bayamón, July 20 to 25 (specimen); Martin Peña, January 2 (specimens); Mameyes, February 9 to 29 (specimens); Humacao, September 3 to 9; Yabucoa, May 3 to 10 (specimen); Maunabo, May 11; Patillas, May 13; Salinas, April 26 to May 2 (specimens); Juana Diaz, August 17 to 22 (specimens); Yauco, May 16 to 28 (specimens); Cabo Rojo, August 24 to 31 (specimens); Aguadilla, June 9 to 12 (specimens). There are in the U. S. National Museum specimens shot at Luquillo, March 4, 1900; Arecibo, April 1 to 3, 1900, and Pueblo Viejo, February 17, 1900, by C. W. Richmond; at Ponce, January 31, 1889, and Hucares, February 15, 1899, by A. B. Baker; and at Arroyo, February 3 and 4, by A. B. Baker and J. D. Milligan. In Porto Rico the resident golden warbler is confined entirely to the coastal plain, ranging inland along

the courses of the rivers to the base of the foothills, but never going farther. The highest point at which they were noted was at Quebradillas, where the birds were distributed over high flats, three or four hundred feet above the sea. In December and January, in the region about San Juan, I found these birds were confined mainly to mangroves and narrow bands of bush back of the beaches. Later, after the first of February, I saw them farther inland, where about Río Piedras they were common in shade trees near houses. It would seem that they spread out for the breeding season—a supposition that must be checked by further observations before it is accepted as certain. At Bayamón they were found in scanty growths of grass and weeds growing on gravel bars in the Bayamón River. At the Laguna de Guánica, where there were no bushes or mangroves, they frequented reeds and clumps of marsh grass. The dense growths of sea grape, or uvas de playa (*Coccolobis*), on sandy beaches form good cover for them. In all the coast towns one or two pairs nested in the plazas, where there were suitable trees.

These warblers are quick and active and, in spite of their bright coloration, are hard to see in the trees, where the movement of the leaves in the steady trade winds helps to hide them. They are seen at their best in mangrove growths bordering bays or lagoons. Here they show little fear, feeding about close at hand. The song of this warbler is loud and cheery, as in the yellow warbler of the United States (*Dendroica aestiva*). The call-note is a sharp *chip*. From February to June, which corresponds to the breeding season, males sing the whole day long, and an intruder in their haunts is greeted with loud expostulations. I saw no nests, but birds taken at Salinas on April 29, Yabucoa on May 6, and Yauco on May 18, 1912, were breeding. July 8, at Manatí, a young bird just from the nest was taken, and after this date young were common. The adults may remain paired throughout the year, for at Cabo Rojo, late in August, at a season when they were in full molt, male and female were invariably seen together. Danforth found that three eggs constituted the normal set and noted a few nests built in cat-tails at Cartagena Lagoon. The eggs are greenish white, spotted with rufous.

On Vieques Island the golden warbler is a common resident and is found in brushy pastures wherever trees or bushes afford shelter. Scattered trees growing in upland pastures, with the lower branches trimmed by browsing cattle to a uniform height above the ground, were favorite haunts, and in addition I found many of these warblers in the shade trees bordering the streets in the town of Isabel II. I secured a number of specimens between March 16 and April 3, 1912, and noted that the breeding season had not yet begun. Bowditch did not report this species

from Vieques, but Richmond collected a series there from March 25 to 28, 1900.

On Culebra Island I found golden warblers abundant from April 5 to 21, 1912, and collected a number. They ranged in mangroves bordering the lagoons, in trees in the dry pastures, or in heavy growths of sea grape on the beaches. They were paired and were about to begin nesting at this season.

On St. Croix the species is said to be common. The Newtons report that it builds in a low shrub, usually not more than six feet from the ground. They describe the nest as cup-shaped, softly lined with cotton or wool, and the eggs as three in number. Cory received specimens from St. Croix and Nicoll collected one there between February 19 and 21, 1904. Mortensen states that the species is known there as the wild canary. There are three skins in the Museum of Comparative Zoölogy taken on St. Croix, September 14 and 16, 1914, by G. K. Noble.

On St. Thomas in 1852 Knox describes the golden warbler as destructive to grapes. Robert Swift forwarded specimens to Cassin from that island, and in the U. S. National Museum are skins from the same collector. A specimen was taken at St. Thomas by Benedict and Nye between January 17 and 24, 1884, and Nicoll secured the form between February 21 and 24, 1904. Cyrus S. Winch sent specimens to Cory from Virgin Gorda and Anegada; a skin in the U. S. National Museum was secured by this collector on the island last named December 26, 1889.

Peters²⁴ has indicated that the golden warblers of Porto Rico and the Virgin Islands should be known as *Dendroica petechia cruciana*. They are closely similar to *D. p. bartholemica*, which, in my opinion, ranges in the Lesser Antilles from the Anegada Channel south to Antigua, but are distinguished by slightly brighter, yellower hue of the dorsal surface, particularly in the males. Specimens from St. Thomas and St. John are intermediate, but it seems best to allocate them with *cruciana*, which makes the Anegada Channel a dividing line between the two forms.

The yellow, or golden, warbler of Porto Rico is bright greenish yellow above, becoming bright yellowish orange or even deep orange on the forehead and bright yellow below, streaked more or less distinctly with bright chestnut brown. Females are duller and lack the streaks below or have them only faintly indicated. Young in nestling plumage are grayish above and grayish white below.

²⁴ Peters, J. L., Proc. Biol. Soc. Washington, March 5, 1927, vol. 40, pp. 35-37. This author places the golden warbler of St. Thomas, Tortola, Virgin Gorda and Anegada with *D. p. bartholemica* in which I do not agree.

Dendroica magnolia (Wilson)

Magnolia Warbler, Reinita, Bijirita Manchada

Sylvia magnolia Wilson, Amer. Orn., 1811, Vol. III, p. 63, Pl. 23, Fig. 2.
(Little Miami, near its junction with the Ohio; in magnolias near Fort Adams, on the Mississippi; near Philadelphia, Pa.)

Magnolia Warbler, Danforth, Oölogist, 1922, p. 178 (Porto Rico, rare).

Dendroica maculosa, Bello, Zool. Gart., 1871, p. 349 (Porto Rico, listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 183 (Porto Rico, pictured in album of Bello).—Stahl, Faun. Puerto Rico, 1883, p. 59 (listed).—Cory, Cat. West Indian Birds, 1892, p. 118 (Porto Rico).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 535 (Porto Rico).—Bowditch, Auk, 1903, p. 18 (San Juan, Mayagüez).

Dendroica magnolia, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 105 (listed).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 120 (Cartagena Lagoon, Mayagüez).

Porto Rico; rare in winter.

Bello includes the magnolia warbler in his list of Porto Rican birds without comment and it is doubtful whether he secured specimens. Gundlach knew it only from its inclusion in an album of paintings by Bello. Bowditch saw one in the city of San Juan on September 26, 1899, and shot one in Mayagüez, December 26, 1900. Danforth has recorded it as rare in western Porto Rico; he reports it at Cartagena Lagoon, November 30, 1923, and at Mayagüez from March 25 to April 3, 1922, and on December 3, 1923. The species is apparently irregular in occurrence.

The species is distinguished from other warblers by the broad band of white across the middle of the tail, followed by a broad tip of black. The adult male has the crown gray, cheeks and back black, rump and under surface yellow, with breast and sides streaked with black. Immature birds are duller, with olive-green back, but are distinguished by the peculiar tail-marking.

Dendroica caerulescens caerulescens (Gmelin)

Black-throated Green Warbler, Reinita, Bijirita Aplomada

Motacilla caerulescens Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 960. (Santo Domingo.)

Black-throated Blue Warbler, Danforth, Oölogist, 1922, p. 178 (Porto Rico).

Dendroica caerulescens, Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, p. 159; Anales Soc. Esp. Hist. Nat., 1878, p. 179 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (Porto Rico, specimen); Ornis, 1887, p. 451 (Porto Rico, migrant).—Cory, Cat. West Indian Birds, p. 118 (Porto Rico).

Dendroica caerulescens caerulescens, Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 543 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 104-105 (Porto Rico, Vieques); Auk, 1916, p. 417 (Vieques, seen).—Struthers, Auk, 1923, p. 477 (Maricao, specimens).

Porto Rico, rather rare in winter; Vieques, casual.

The black-throated blue warbler was reported by Gundlach from a painting made by Bello and a specimen in the collection of Blanco. Stahl recorded a male in his collection. I secured a specimen at Río Piedras, December 23, 1911, noted adult males in the hills above Cayey, January 18 and 24, 1912, and found the bird common about Aibonito from January 26 to February 5 (adult female taken January 29, adult males January 30 and February 2.) At the Hacienda Catalina above Mameyes I observed three warblers on March 2 and 4, and on March 8 found them fairly common in the higher forests of El Yunque, where two females were taken, one at an altitude of 3100 feet. In the U. S. National Museum are two specimens taken by C. W. Richmond on El Yunque, February 26 and March 2, 1900.

Mr. F. A. Potts writes me that he saw a few black-throated blue warblers on March 27, 1921, in a coffee plantation near the Toro Negro dam, seven miles northwest of Villalba. Struthers secured specimens above Maricao on December 27 and 30, 1921, and Danforth in 1922 reported the birds as locally common near Mayagüez up to April 15. Three males in the collections of the Carnegie Museum were secured near Adjuntas by W. W. Worthington on April 4, 9 and 11, 1912.

This warbler appears to seek the forests of the interior hills and mountains during its winter residence in Porto Rico, and there ranges to the highest altitudes. Comparatively few of these birds are seen below an elevation of 500 feet above the sea, which may account for the small number of records for the species. The birds are active, like all other warblers, but frequent the shelter of trees, where they may be overlooked.

On Vieques Island, March 27, 1912, I observed several in migrating flocks of other warblers, but did not collect specimens.

The black-throated blue warbler is distinguished in all plumages by the prominent white spot across the center of the outer primaries on a wing otherwise plain in color. Males are grayish blue above, black on sides of head, throat and sides, and white on breast and abdomen. Females are greenish olive above and yellowish olive below.

***Dendroica coronata coronata* (Linnaeus)**

Myrtle Warbler, Reinita, Bijirita Coronada

Motacilla coronata Linnaeus, Syst. Nat., ed. 12, 1766, Vol. I, p. 333. (Near Philadelphia, Pa.)

Myrtle Warbler, Danforth, Oölogist, 1922, p. 178 (western Porto Rico, winter); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Motacilla umbria, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 205 (Porto Rico).*Sylvicola coronata*, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 251 (Porto Rico).*Dendroica coronata*, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (Porto Rico, specimens).—Bello, Zool. Gart., 1871, p. 349 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, p. 159; Anales Soc. Esp. Hist. Nat., 1878, p. 180 (Porto Rico, winter).—Stahl, Faun. Puerto Rico, 1883, p. 59 (Porto Rico, migrant).—Cory, Cat. West Indian Birds, 1892, p. 118 (Porto Rico).—Bowdish, Oölogist, 1900, p. 74 (Vieques, specimens).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 548 (Porto Rico).—Bowdish, Auk, 1903, p. 18 (Vieques, specimens).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 104 (Porto Rico, Vieques); Auk, 1916, p. 417 (Vieques); Auk, 1917, p. 62 (Culebra); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 329 (bones from cave, Morovís).—Struthers, Auk, 1923, p. 477 (Guánica Valley).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 120 (Cartagena Lagoon, Mayagüez).

Porto Rico and Vieques, fairly common in winter; Culebra, one record.

Bryant must have found this species in Porto Rico in some number, for in 1866 he wrote that the "southern migration of this bird is more abundant than I had supposed." There is in the U. S. National Museum a skin taken on Porto Rico by Robert Swift, and Hjalmarson sent specimens to Sundevall in the sixties. Gundlach found it common, and states that the bird is the last of the migrants to arrive in fall, while it leaves for the north in March. During my work in 1912 I noted the first arrival in Caguas on January 5, and recorded the birds daily in the flame-trees of the plaza until January 14. At Cayey I found them in trees bordering the roads from January 15 to 25 (specimen taken January 19), and at Aibonito saw one, February 2, in a tree standing in a pasture. Near Mameyes a few were noted in the swamps at Punta Picua, or in small trees in the town, from February 9 to 29 (specimen, February 12). On March 8, as I reached the bare rock marking the summit of the great mountain El Yunque, a myrtle warbler—a companion adventurer from North America—circled about me several times and finally disappeared in the forest below.

Danforth reported the myrtle warbler as fairly common in western Porto Rico, becoming more abundant toward spring, and saw the last on April 8, 1922, and April 1, 1924. He recorded the earliest arrival on December 14, 1923, and noted twelve at Cartagena Lagoon, December 22 of that year. Struthers found the bird very common in winter among low bushes near the lagoons of Guánica Valley. I have identified remains of this species from cavern deposits at Morovís. In the Carnegie Museum are specimens collected in 1912 by W. Worthington, as follows: two at Loiza, February 9 and 15; five at Guayama, March 1 to 9, and two from Santa Isabel, March 19 and 21.

On Vieques Island Bowditch collected specimens January 12 and 30, 1900. I saw one in the town of Isabel II on April 1.

There is in the U. S. National Museum a specimen taken by A. B. Baker on Culebra Island on February 9, 1899.

The myrtle warbler has a somewhat nondescript, streaked plumage, but may be identified always by the yellow spots on crown, rump, and either side of the breast—four in all. Its call is a low *chip* that is characteristic when once learned.

***Dendroica virens virens* (Gmelin)**

Black-throated Green Warbler

Motacilla virens Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 985. (Philadelphia, Pa.)

Dendroica virens virens, Todd, Auk, 1925, p. 282 (Adjuntas, specimen).

Porto Rico, casual in winter.

The only record for the black-throated green warbler is that of a specimen in the Carnegie Museum secured at Adjuntas, Porto Rico, on April 5, 1912.

This warbler is somewhat smaller than the average for its genus, and is distinguished by the extensively yellow cheeks and large amount of white in the tail. It is bright olive-green above and white on the abdomen, with sides streaked with black. Adult males have the throat and breast extensively black, while in females and immature birds this area is more or less obscured by yellowish.

***Dendroica dominica dominica* (Linnaeus)**

Yellow-throated Warbler, Reinita, Bijirita Dominica

Motacilla dominica Linnaeus, Syst. Nat., ed. 12, 1766, Vol. I, p. 334. (Santo Domingo.)

Yellow-throated Warbler, Danforth, Oölogist, 1922, pp. 11, 178 (western Porto Rico).

Matacilla pensilis? Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 39 (St. Thomas).

Sylvia pensilis, Ledru, idem., p. 205 (Porto Rico).

Sylvicola pensilis, Hartlaub, Isis, 1847, p. 611 (Porto Rico).

Dendroica pensilis, Bello, Zool. Gart., 1871, p. 349 (listed).

Dendroica dominica, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (Porto Rico, specimen).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 184 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, p. 59 (Porto Rico, listed).—Cory, Cat. West Indian Birds, 1892, p. 118 (Porto Rico).

Dendroica dominica dominica, Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 580 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 104 (Porto Rico, listed).—Struthers, Auk, 1923, p. 476 (Aguirre Central, seen).

Porto Rico; winter visitant.

Sundevall received a specimen of the yellow-throated warbler from Hjalmarson. Gundlach reported it in Hjalmarson's collection and said that the bird occurred in Porto Rico in winter from September to March. He indicates that he collected specimens. Danforth has reported it in November, and on December 31, 1921, in western Porto Rico; Struthers notes one seen January 29, 1922, in shade trees at Aguirre Central, and Potts reports that the bird last mentioned was present for six weeks during January and February.

Ledru has recorded the species from St. Thomas, but his record is dubious.

The yellow-throated warbler, similar in size to the myrtle warbler, is gray above, with forehead blackish, a yellow line in front of the eye, and a white superciliary streak. The cheeks and sides of the throat are black, the throat and breast yellow, belly white, and sides streaked with black.

Dendroica adelaidae Baird

Adelaide's Warbler, Reinita, Bijirita Adelaida, Bijirita Mariposera

Dendroica adelaidae Baird, Rev. Amer. Birds, April, 1865, p. 212. (Porto Rico.)

Adelaide's Warbler, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).

Dendroica canadensis, Bello, Zool. Gart., 1871, p. 349 (Porto Rico, listed).

Dendroica adelaidae, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 25 (listed).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (specimen in spirits).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167-168; Anales Soc. Esp. Hist. Nat., 1878, p. 185 (Mayagüez, Lares, Guánica, Aguadilla, Quebradillas, Arecibo, Vega Baja).—Cory, Auk, 1886, p. 37; Cat. West Indian Birds, 1892, pp.

118, 132 (Porto Rico).—Stahl, Faun, Puerto Rico, 1883, pp. 59, 139 (Porto Rico, specimens); Ornis, 1887, p. 451 (listed).—Hartert, Nov. Zool., 1902, Vol. IX, p. 279 (near Ponce).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 587 (Porto Rico).—Bowdish, Auk, 1903, p. 18 (Aguadilla, specimens). Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 102-104 (Porto Rico, Vieques); Auk, 1916, p. 417 (Vieques, specimens); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 329 (bone from cave, Morovís).—Struthers, Auk, 1923, p. 476 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 119-120 (Porto Rico, distribution, habits).

Porto Rico and Vieques; resident, locally common.

Adelaide's warbler was noted as follows during personal field work late in 1911 and 1912: Quebradillas, July 2 to 6 (specimens); Manatí, July 7 to 11; Río Piedras, December 16 to January 4 (specimens); Mameyes, February 9 to 29 (specimens); Maunabo, May 11; Patillas, May 13; Salinas, April 26 to May 2 (specimens); Juana Diaz, August 17 to 22 (specimens); Yauco, May 16 to 28 (specimens); Cabo Rojo, August 24 to 31; Aguadilla, June 9 to 12; Cayey, January 22. Specimens in the U. S. National Museum taken by Bowdish come from Aguadilla, which is the only point where he saw these warblers. Gundlach recorded them at Mayagüez, Lares, Guánica, Arecibo and Vega Baja, in addition to points that have been mentioned. Hartert found them at Ponce, and in the Carnegie Museum is a skin taken at Loiza, February 7, 1912. Danforth found them in the limestone hills from Ponce to Boquerón and near Quebradillas. I have identified a bone of this species from cavern deposits near Morovís. Adelaide's warblers are found mainly in low hills bordering the coastal plain, but do not penetrate far into the interior. I observed them near Cayey at an altitude of 1200 feet, but did not record them elsewhere above an altitude of 500 feet.

On the north side of Porto Rico I found them in second-growth forest that was tangled with vines and creepers, and as this association occurred mainly on steep-faced limestone hills in such regions, the warbler was encountered most commonly in such locations. Near Mameyes the birds were observed in dense growths bordering the coastal swamps as well as amid the hills farther inland. The dry open scrubs of the south coast were favored haunts; along the Río de la Lapa at Salinas I found them abundant.

They are quick and active in habit, feeding rapidly through the tips of twigs, tumbling after escaping moths, or darting out to seize insects that they have aroused. The dense cover that they affect conceals them well, so that they are often betrayed only by their active movements or their calls. Males sing at short intervals during forenoon and evening,

or occasionally during the middle of the day. The song is a sudden, loud trill consisting of one note rapidly repeated, and is quite similar in sound and character to the song of Grace's warbler (*Dendroica graciae*). I heard also a low *tsee tsee*, somewhat like the notes of a gnat-catcher, and likewise a louder, scolding call.

The breeding season came in May and June. Struthers has recorded nesting birds in May, 1921. A nest that I found near Yauco on May 22, 1912, was in a forked limb of a bush growing in a thicket, at an elevation of four feet from the ground. Externally this nest was composed of gray moss, while the lining was fine grass. It was empty. Bowdish secured, on June 15, 1900, a juvenile recently from the nest. Immature birds in first fall plumage were seen on July 3, 1912, near Quebradillas, and from that date on were noted frequently. Adults were in molt in August.

From Vieques Island Adelaide's warbler was not known until my visit in 1912. I found the birds locally common in the brush-grown valleys of the northern side of the island and in the dry scrubs of the south coast. They were breeding here in the latter part of March. Specimens taken on March 20, 21 and 25 do not differ in any way from skins from Porto Rico.

The species was named by Baird in honor of Miss Adelaide Swift, daughter of Robert Swift, who collected the type specimen in Porto Rico. The bird is gray above, with yellow on eyelids and superciliary stripe, and bright yellow below. There are two white wing bars.

This warbler feeds on small insects, mainly on leaf-hoppers and related forms, although weevils, caterpillars, moths and other insects are taken. It is a beneficial species.

***Dendroica striata* (J. R. Forster)**

Black-poll Warbler, *Reiníta*, *Bijirita Estriada*, *Bijirita Rayada*

Muscicapa striata J. R. Forster, Phil. Trans., 1772, Vol. LXII, pp. 406, 428.

(Fort Severn, West Coast of Hudson Bay.)

Dendroica striata, Bello, Zool. Gart., 1871, p. 349 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311 (specimen); Journ. für Ornith., 1878, pp. 159, 167 (taken in September); Anales Soc. Esp. Hist. Nat., 1878, p. 181 (Agua-dilla, Bayamón).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (specimen, Porto Rico); Ornith., 1887, pp. 449, 451 (arrives middle of August).—Cory, Cat. West Indian Birds, 1892, p. 118 (Porto Rico).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 597 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 102 (listed).—Struthers, Auk, 1923, p. 476 (Maricao).

Porto Rico; rare in migration.

Gundlach states in one reference that he secured a black-poll warbler in September, but in another place says that he observed the species in Aguadilla in September and saw one that had been killed in Bayamón. The latter is probably the bird listed by Stahl as in his collection. Stahl states that the black-poll arrives in migration the middle of August, but this is doubtful, as the time indicated is too early to enable this bird to arrive from its northern home.

Struthers reports seeing the species near Maricao on November 11 and 12, 1921.

Fall individuals of this species are obscurely marked, being olive-green above, streaked with black, and yellowish white below, streaked with black or dusky. There are two white wing-bars. Adult males have the crown black, the lower surface white, and the black streaks more sharply defined.

***Dendroica discolor* (Vieillot)**

Prairie Warbler, Reinita, Bijirita Galana

Sylvia discolor Vieillot, Ois. Amer. Sept., 1807, Vol. II, (1809?) p. 37, Pl. 98. (Eastern United States or Greater Antilles.)

Prairie Warbler, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez); Oölogist, 1922, pp. 11, 178 (Porto Rico).

Sylvicola discolor, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 251 (listed).

Dendroica discolor, Newton, Ibis, 1859, p. 144 (St. Croix).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (Porto Rico, specimens).—Bello, Zool. Gart., 1871, p. 349 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 188 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (Porto Rico, specimens).—Cory, Auk, 1890, p. 375 (Tortola, Virgin Gorda, specimens); Auk, 1891, p. 48 (St. Croix, specimen); Cat. West Indian Birds, 1892, p. 118 (Mona, Porto Rico, Tortola, Virgin Gorda, St. Croix).—Bowditch, Oölogist, 1900, p. 74 (Vieques); Auk, 1903, p. 19 (Porto Rico).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 609 (Porto Rico, Mona, Culebra, St. Thomas, Tortola, Virgin Gorda, St. Croix).—Nicoll, Ibis, 1904, pp. 575, 576 (St. Croix, St. Thomas, specimen).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 102 (Porto Rico, Vieques, Culebra); Auk, 1917, p. 417 (Vieques, specimens); Auk, 1917, p. 61 (Culebra).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 121 (Cartagena Lagoon, Mayagüez).

Mona, Porto Rico, Vieques, Culebra, St. Thomas, St. Croix, Tortola, Virgin Gorda; winter visitant.

The prairie warbler is listed by Cory for Mona Island, it is presumed on the basis of data secured by W. W. Brown, Jr., who collected for him on that island.

The species is common on Porto Rico, where it occurs in thickets, low bushes or hedges throughout the island, but it is not found where forest growth is heavy. Mr. F. A. Potts reports its arrival from the north on September 5, 1921, at Central Aguirre, and noted the last in spring on April 20. Danforth recorded the first on September 20, 1924, and the last at Cartagena Lagoon on April 22, 1922. There is in the U. S. National Museum a skin taken at Caguas, January 8, 1899, by A. B. Baker. On December 29, 1911, I collected a specimen at Fajardo, and on January 2, 1912, I found the birds fairly common in bushes back of the beach at Punta Maria, opposite Martin Peña, and secured two. One was taken at Cayey, January 17, and one at an elevation of 2000 feet, near Aibonito, on January 30. Danforth reports three near Mayagüez, December 18, 1921. The species seems more common during the period of migration, but remains in fair numbers through the winter.

Bowdish found the prairie warblers common on Vieques Island, and secured specimens on January 27, 1900. Richmond in his notes recorded one on March 24, 1900. I found the species common from March 16 to April 3, 1912, and secured specimens on March 19 and 25. Migrant swarms of these and other warblers passed from March 19 to 27, during which there was marked diurnal movement among them toward the west.

On Culebra Island a prairie warbler was collected on February 9, 1899, by A. B. Baker, while I secured two on April 9 and 10, 1912. The birds were noted on April 6, 7, 9 and 10, and on April 9, during a wave of migrant warblers, several were noted. One that I shot on April 6 was so fat that grease soaked the entire plumage almost instantly.

The Newtons found the prairie warbler rather common on St. Croix in winter, noting its arrival on September 10, 1858, and the last on March 27 (year not given). Cory reports it from St. Croix in his collection, and Nicoll in 1904 found it abundant there from February 19 to 21. There is in the Museum of Comparative Zoölogy one taken on St. Croix by G. K. Noble, September 14, 1914. The Smithsonian Institution received a specimen from St. Thomas through the taxidermist and dealer John Akhurst in 1863, and Nicoll reports the species as taken there between February 21 and 24, 1904. Winch secured specimens for Cory on Tortola and Virgin Gorda.

During winter the birds are active in their search for food on the ground or among bushes, but keep in such cover that often it is difficult to see them clearly. They may be distinguished by their small size (smaller than that of the golden warbler), bright yellow underparts and the white displayed prominently in the tail. Adult males have distinct

black marks through and below the eye, black streaks on the sides and a partly concealed patch of bright brown in the back—markings that are obscured or lacking in females and young. All are bright yellowish green above.

***Dendroica palmarum palmarum* (Gmelin)**

Palm Warbler, Reinita, Bijirita de Palmas, Bijirita, Palmera

Motacilla palmarum Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 951. (Santo Domingo.)

Sylvia palmarum, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 205 (listed).

Dendroica palmarum, Bello, Zool. Gart., 1871, p. 349 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 183 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (Porto Rico, specimens); Ornith., 1887, p. 451 (migrant).—Cory, Cat. West Indian Birds, 1892, p. 118 (Porto Rico).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 613 (Porto Rico).—Bowditch, Auk, 1903, pp. 18-19 (Porto Rico, winter).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 101 (Mameyes, specimen).

Porto Rico, rare winter visitant.

Gundlach and Stahl report specimens of the palm warbler, and Bowditch secured three in a mangrove swamp near San Juan on February 12, March 10, and April 8, 1900, respectively. A. B. Baker collected one at Caguas, January 8, 1899, and Richmond and Stejneger saw several and collected one near the beach at Arecibo on April 4, 1900. I shot a female in a mangrove swamp near Mameyes on February 16, 1912, and there is in the Carnegie Museum a further specimen taken at Santa Isabel, March 23, 1912, by W. W. Worthington.

The palm warbler usually feeds on the ground, where it walks about with steadily tilting tail, but is found at times among bushes or at the margins of thickets. It is gray washed faintly with yellow below, yellow on the under tail coverts, brownish gray above, with more or less chestnut on the crown, yellowish green on the rump, and prominent white spots in the tail.

***Seiurus noveboracensis noveboracensis* (Gmelin)**

Water-thrush, Pizpita de Mangle, Pizpita Chica

Motacilla noveboracensis Gmelin, Syst. Nat., 1789, Vol. I, Pt. 2, p. 958. (Louisiana and New York.)

Water-thrush, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).

Motacilla noveboracensis, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 205 (listed).

Seiurus noveboracensis, Newton, Ibis, 1859, pp. 142-143 (St. Croix).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167;

Anales Soc. Esp. Hist. Nat., 1878, p. 175 (Porto Rico, taken).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 138 (Porto Rico, specimens).—Cory, Auk, 1891, p. 48 (St. Croix, specimen); Cat. West Indian Birds, 1892, p. 119 (Mona, Porto Rico, St. Croix).—Bowdish, Auk, 1903, p. 19 (Porto Rico, specimens).

Seiurus noveboracensis noveboracensis, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 99-100 (Porto Rico, Culebra, Louis Peña); Auk, 1917, pp. 55, 61 (Culebra, specimen; Louis Peña).—Struthers, Auk, 1923, p. 476 (coastal region, Porto Rico).—Schmidt, Field Mus. Nat. Hist., Zool. Ser., 1926, Vol. XII, p. 151 (Mona).—Danforth, Journ. Dept. Agric., 1926, Vol. X, p. 122 (Porto Rico, distribution).

Mona, Porto Rico, St. Croix, Culebra, Louis Peña; winter visitant from North America, fairly common.

Cory in 1892 lists this water-thrush from Mona Island presumably on the basis of specimens taken by W. W. Brown, Jr. (The bird reported by Bowdish from Mona is *Seiurus motacilla*.) This is probably a record from a migrant, since Mona appears too dry to provide a suitable winter home for this bird.

On Porto Rico the water-thrush is of regular occurrence in the coastal region, where it is fairly common in suitable localities. At Mameyes from February 9 to 29, 1912, I found it fairly abundant along the coast. One was seen at Cabo Rojo, August 30. Bowdish reports one taken at Mayagüez, November 30, 1900, and Richmond shot a bird at Arecibo, April 1, 1900, that I find represents this subspecies. Mr. F. A. Potts writes me that he saw the last water-thrush for the spring at Central Aguirre on April 17, 1921, while Struthers records the last in spring in western Porto Rico on April 23, 1921, and the first in fall on September 23, 1921. Danforth has recorded the water-thrush as common at Cartagena Lagoon, arriving September 3, 1924, and leaving April 30, 1924.

On Culebra Island, from April 5 to 21, 1912, water-thrushes were evidently in migration, as the number seen varied from day to day. During this period they were common. Both subspecies were represented, but females of the typical form were taken on April 6 and 12. I saw water-thrushes on Louis Peña, April 11.

The Newtons note the water-thrush as fairly common on St. Croix and Cory reports a specimen taken on that island.

It is probable that some of the records cited above may refer to Grinnell's water-thrush, which in life cannot be distinguished from the typical form.

In my field work in Porto Rico I found water-thrushes only in the mangrove swamps of the coastal region. Here they walk about over

the mud or along the arching mangrove roots, often where the light is so dull that the birds would be almost indistinguishable were it not for the constantly wagging tail whose motion betrays them. Their sharp call-notes indicate their presence in many cases, although the birds be hidden in the dense growth of roots and stems.

The water-thrush is dull olive above and light yellow below streaked with dusky. There is a prominent buffy streak over the eye.

***Seiurus noveboracensis notabilis* Ridgway**

Grinnell's Water-thrush, Pizpita de Mangle, Pizpita Chica

Seiurus naevius notabilis Ridgway, Proc. U. S. Nat. Mus., 1880, Vol. III, p. 12. (Shores of Como Lake, Carbon Co., Wyoming.)

Seiurus noveboracensis notabilis, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 100 (Mameyes and Culebra Island, specimens); Auk, 1917, p. 60 (Culebra, specimen).

Porto Rico, Culebra Island; winter visitant and migrant.

On February 14, 1912, I shot an adult male of this form in the mangrove swamps at Punta Picua on the coast opposite Mameyes, and on April 12 secured another near Playa Sardine on Culebra Island. As the subspecies differs from the water-thrush *S. n. noveboracensis* only in slightly larger size and in faintly grayer dorsal coloration, it may be distinguished only with specimens in hand. Its abundance and occurrence are uncertain.

In habits it does not differ from the typical form.

***Seiurus motacilla* (Vieillot)**

Louisiana Water-thrush, Pizpita Chica

Turdus motacilla Vieillot, Ois. Amer. Sept., 1807 (1808?), Vol. II, p. 9, pl. 65. (Kentucky.)

Louisiana Water-thrush, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez); Oölogist, 1922, p. 178 (western Porto Rico); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Seiurus motacilla, Bowdish, Oölogist, 1900, p. 74 (Vieques, specimens).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 640 (Porto Rico).—Bowdish, Auk, 1903, p. 19 (Vieques, Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 100 (Porto Rico); Auk, 1916, p. 417 (Vieques).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 122-123, Fig. 45 (Cartagena Lagoon).

Seiurus noveboracensis Bowdish (part), Auk, 1903, p. 19 (Mona, specimen).

Porto Rico and Vieques Island, fairly common winter visitant; Mona Island, accidental.

The specimen of water-thrush secured by Bowdish on Mona Island on August 18, 1901, which is preserved in the U. S. National Museum,

though reported as *S. noveboracensis*, proves on examination to be *S. motacilla*. The species must be only casual there in migration.

In 1912 I found the Louisiana water-thrush at Mameyes, February 9 to 29; Cayey, January 17 to 25 (three specimens January 17 and 22); Aibonito, January 29 (specimen) and February 1 and 2; and near the Hacienda Catalina, below El Yunque, March 4 and 7. Early writers have probably confused this bird with the true water-thrush, since the first record for the present species is that of Bowdish based on a specimen taken at Mayagüez, November 30, 1900. Struthers in 1921 found it near Mayagüez in spring until March 25, and reports the earliest arrival from the north in fall on August 31, 1921. Danforth saw it near Cartagena Lagoon, arriving September 6, 1924, and recorded the last for the spring on April 10, 1924, and April 22, 1922.

I found Louisiana water-thrushes in the mangrove swamps of the coast, but noted them also inland, where they followed the gravelly beds of rapid little streams that ran through coffee and banana plantations. They differ thus from *Seiurus noveboracensis*, which does not seem to frequent inland localities. Attention is always drawn to them by their sharp notes, which are higher pitched than those of the related species, and the steadily wagging tail instantly catches the eye as they walk along on the ground.

Bowdish found this species on Vieques Island and reports three specimens. One of these, in the U. S. National Museum, was taken on January 29, 1900, the other two on December 27, 1899, and January 22, 1900, respectively. There is another in the U. S. National Museum secured on Vieques by A. B. Baker on February 7, 1899. My records report the presence of this water-thrush until March 27, 1912.

The Louisiana water-thrush differs from the preceding species in whiter underparts tinged faintly with cream-buff on the flanks, larger bill, and entire lack of streaks on the throat.

***Seiurus aurocapillus aurocapillus* (Linnaeus) ²⁵**

Ovenbird, Pizpita Dorada

Motacilla aurocapilla Linnaeus, Syst. Nat., ed. 12, 1766, Vol. I, p. 334. (Near Philadelphia, Pa.)

Ovenbird, Danforth, Oölogist, 1922, p. 178 (western Porto Rico).

Turdus auro-capillus, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 203, 269-270 (listed).

Henicocichla aurocapillus, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (listed).

²⁵ Mr. Batchelder in Proc. New England Zoöl. Club, February 6, 1918, Vol. VI, p. 81, has described the ovenbird of Newfoundland as a distinct subspecies, *S. a. furvior*.

Siurus aurocapillus, Newton, Ibis, 1859, p. 142 (St. Croix).

Seiurus aurocapillus, Hartlaub, Isis, 1847, p. 611 (listed).—Bello, Zool. Gart., 1871, p. 349 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 175 (Porto Rico, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 138 (Porto Rico, specimen); Ornith., 1887, p. 451 (migrant).—Cory, Cat. West Indian Birds, 1892, p. 119 (Porto Rico, St. Croix).—Bowditch, Oölogist, 1900, p. 74 (Vieques Island, specimen); Auk, 1903, p. 19 (Porto Rico, Vieques).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 636 (Porto Rico, St. Croix).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 101 (Porto Rico, Vieques); Auk, 1916, p. 417 (Vieques, specimen); Auk, 1917, p. 61 (Culebra Island, specimen).—Struthers, Auk, 1923, p. 476 (Porto Rico, frequent).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 121 (Cartagena Lagoon, Mayagüez).

Porto Rico, Vieques, Culebra, St. Croix, St. Thomas; winter visitant.

In Porto Rico the ovenbird is fairly common in winter. Gundlach states that it arrives from the north in October; Bowditch noted October 14 as the earliest date of arrival at Mayagüez in 1901, and Struthers indicated October 18 as the earliest date of arrival in 1921, and April 18 as the last date of departure. Mr. F. A. Potts writes me that his latest record for Central Aguirre is April 18, 1921, while Danforth reports seeing the last at Mayagüez on April 20, 1922, and April 10, 1924, and the first arrival on September 24, 1924. During my field work I found the species at Río Piedras from December 21, 1911 (specimen taken) to January 4, 1912; Cayey, January 19 (specimen); Aibonito, January 26 to February 5 (specimen, January 27); Mameyes, February 9 to 29 (specimen, February 23); Hacienda Catalina, below El Yunque, March 4 and 10. There is a skin in the U. S. National Museum taken by J. D. Milligan at Hucars, February 13, 1899, and C. W. Richmond noted the species at Utuado on April 6, 7 and 8, in 1900, securing a specimen on the last of the dates mentioned. Worthington, collecting for the Carnegie Museum, obtained specimens near Adjuntas on April 1, 4, 5, 8 and 10, in 1912.

On the coastal plain I found ovenbirds at times walking between the rows in the cane-fields and also noted them with water-thrushes in mangrove swamps. In other sections they were found in thickets or second-growth forests. On the slopes of El Yunque I observed them in the forests to an elevation of 900 feet, while at Aibonito they were found 1900 feet above the sea.

They walk quietly about on the ground with wagging tails, and, when frightened, fly up to rest for a time on some sloping limb until their alarm has passed, and then drop back again to the ground. In their winter homes these birds are silent.

On Vieques Island Bowdish observed several and collected one on January 16, 1900. Richmond, during the same year, saw one on March 24 and shot a specimen on March 28. In 1912 I found the birds fairly common from March 16 to 27 and secured skins on March 19 and 20. They occurred in sheltered areas in the dry thickets. On March 19 and again on March 27 they appeared in numbers in migration, indicating a considerable flight in fall beyond this point.

An ovenbird was secured on Culebra Island, February 11, 1899, by A. B. Baker, and there is a skin in the U. S. National Museum sent from St. Thomas by Robert Swift. The Newtons report the ovenbird on St. Croix as not common and say that it leaves for the north in April.

The ovenbird resembles the water-thrushes in form, in its habit of wagging the tail, and in the light underparts streaked with black, but is greenish olive above, with a partly concealed crown patch of cinnamon-buff bordered by indefinite streaks of black.

***Oporornis philadelphia* (Wilson)**

Mourning Warbler

Sylvia philadelphia Wilson, Amer. Orn., 1810, Vol. II, p. 101, Pl. 14, Fig. 6. (Near Philadelphia, Pa.)

Oporornis philadelphia, Todd, Auk, 1925, p. 282 (Santa Isabel, Porto Rico, specimen).

Porto Rico, casual.

A female collected at Santa Isabel, Porto Rico, March 21, 1912, by W. W. Worthington and reported by Todd is the only record known for this bird in the West Indies. The species breeds in the eastern portion of the United States and Canada and normally winters from Nicaragua to Ecuador.

***Geothlypis trichas brachidactyla* (Swainson)**

Northern Yellowthroat, Pica-tierra, Reinita

Trichas brachidactylus Swainson, Anim. in Menag., 1838, p. 295. (Northern Provinces of United States.)

Maryland yellowthroat, Potts, Auk, 1927, p. 120 (Central Aguirre).

Motacilla mistacea, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 205 (listed).

Sylvia trichas, Hartlaub, Isis, 1847, p. 611 (listed).

Geothlypis trichas, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 187 (Porto Rico, rare).—Stahl, Faun. Puerto Rico, 1883, p. 59 (listed).—Cory, Cat. West Indian Birds, 1892, p. 119 (listed).

Geothlypis trichas brachidactyla, Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 665 (Porto Rico?).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 99 (listed).—Danforth, Auk, 1925, p. 563 (Desengaño, seen).

Porto Rico; apparently very rare visitant in winter.

Gundlach says of the yellowthroat merely that he killed a bird of this species. Mr. F. A. Potts writes under date of May 15, 1921, that, on January 6, 1921, he saw a female and two males in mangroves three miles west of Central Aguirre. Danforth has recorded a male seen April 18, 1924, at Cartagena Lagoon.

The yellowthroat inhabits thick cover in swamps and marshes, where it may easily be overlooked as it feeds and moves under heavy cover. It is a small warbler, yellowish below and yellowish olive above, with a broad band of black like a veritable mask, extending from the eyes across the front of the head in the male. In the female this prominent identification mark is lacking. Assumption that the bird that comes to Porto Rico as a winter migrant is *G. t. brachidactyla* and not typical *G. t. trichas* is based on probability, for the former is the bird that goes regularly to Cuba and has been found in Jamaica. Specimens should be collected in Porto Rico when practicable.

***Setophaga ruticilla* (Linnaeus)**

Redstart, Reinita, Candelita, Coli Rubio

Motacilla ruticilla Linnaeus, Syst. Nat., ed. 10, 1758, Vol. I, p. 186. (Virginia.) Redstart, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez); Oölogist, 1922, pp. 11, 178 (western Porto Rico); Bird-Lore, 1924, p. 52 (Cartagena Lagoon). *Muscicapa ruticilla*, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 202, 268 (listed). *Setophaga ruticilla*, Hartlaub, Isis, 1847, p. 611 (listed).—Newton, Ibis, 1859, pp. 144-145 (St. Croix).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 251 (listed).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (Porto Rico, specimen).—Bello, Zool. Gart., 1871, p. 349 (listed).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 167; Anales Soc. Esp. Hist. Nat., 1878, p. 187 (Porto Rico, winter).—Stahl, Faun. Puerto Rico, 1883, pp. 59, 139 (Porto Rico, specimens); Ornis, 1887, pp. 449, 451 (migrant).—Cory, Auk, 1890, p. 379 (Tortola, Virgin Gorda, specimens); Auk, 1891, p. 48 (St. Croix); Cat. West Indian Birds, 1892, p. 120 (Porto Rico, Tortola, Virgin Gorda, St. Croix).—Bowditch, Oölogist, 1900, p. 74 (Vieques, specimens); Auk, 1903, p. 19 (Porto Rico, Vieques).—Nicoll, Ibis, 1904, p. 576 (St. Thomas, specimen).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 98-99 (Porto Rico, Culebra, winter); Auk, 1916, p. 417 (Vieques); Auk, 1917, pp. 55, 61 (Culebra, Louis Peña).—Struthers, Auk, 1923, p. 46 (western Porto Rico, winter).—Danforth, Journ. Dept. Agric., 1926, Vol. X, p. 123 (western Porto Rico).

Porto Rico, Vieques, Culebra, Louis Peña, St. Croix, St. Thomas, Tortola, Virgin Gorda; found during winter.

On Porto Rico the redstart is common through the season of winter wherever there are trees. I noted these birds alike in mangroves, forests, coffee plantations and shade trees about houses. Stahl stated that they arrived from the north the middle of August, but others do not record them until September. Bowdish noted the first comers at Mayagüez on September 24, 1900, and Danforth at the same point reports the first for 1921 on September 23. Mr. Potts saw the first one at Central Aguirre, September 18, 1921. The birds remain on the island until April. Richmond noted one at Ponce on April 16, 1900; Struthers reports the last one at Mayagüez on April 9, 1921, and F. A. Potts writes me that his latest record is of one seen April 29. Danforth saw the last on April 26, 1924, near Cabo Rojo Lighthouse.

During my field work I saw the redstart at Río Piedras, December 16, 1911, to January 4, 1912; Mameyes, February 9 to 29; Aibonito, January 26 to February 5; Cayey, January 15 to 25; Caguas, January 5 to 14, and on the lower slopes of El Yunque, above the Hacienda Catalina, March 2 and 4. The greater number of those seen were immature birds and females, though occasionally fully plumaged males were observed.

The redstart is the very essence of restless energy and in its active search for insects is seemingly never still. In the dense forests on El Yunque redstarts were seen up to 1500 feet, and elsewhere, in more open localities, were found at the highest altitudes. Next to the parula warbler, this is the most common of the wintering warblers. On Vieques Island Bowdish found it November 30, 1899, and Richmond recorded an adult male on March 24, 1900. From March 16 to April 4, 1912, these warblers were noted regularly and seemed to be in migration; they were found in especial numbers on March 27. On Culebra, in April, they were fairly common in company with other migrant warblers. Several adult males were seen, but most of those recorded were females or immature males. I found them, April 11, on Louis Peña Island and recorded the last one on Culebra, April 19.

The Newtons report the redstart as a winter visitant to St. Croix that is common in spring. They found it very numerous at the end of April, 1857, but in 1858 the greater part departed in March, though one was seen on May 1. The first to arrive in fall was recorded on September 6, 1858. Cory reports the species taken on St. Croix in 1891.

There are now four skins in the U. S. National Museum taken on St.

Thomas by Robert Swift, and in early days the Smithsonian Institution received one from that island through John Akhurst. M. J. Nicoll reports it taken on St. Thomas from February 21 to 24, 1904.

Cyrus S. Winch secured specimens for Cory on Tortola and Virgin Gorda.

The male redstart is a gorgeous creature with upperparts, throat and breast shining black, belly white and large patches of salmon red in wings and tail. In females and young males the black is replaced by grayish or ashy above and by white below, with wing and tail patches of dull yellow.

The species feeds entirely upon small insects and is a bird of considerable economic importance, destroying, as it does, many injurious forms.

Family PLOCEIDAE

Subfamily ESTRILDINAE

Spermestes cucullatus cucullatus Swainson

Hooded Weaver-finch, Diablito, Chupador de Arroz, Gorrión

Spermestes cucullatus Swainson, Birds West. Africa, 1837, Vol. I, p. 201. (Senegambia.)

Hooded Weaver-finch, Danforth, Oölogist, 1922, p. 41 (Mayagüez).

Loxia cucullata, Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 254 (Porto Rico, specimens).

Spermestes cucullatus, Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 174; Anales Soc. Esp. Hist. Nat., 1878, p. 206 (Mayagüez, Lares, Quebradillas, Vega Baja).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 142 (Porto Rico, specimens).—Cory, Auk, 1886, p. 214 (Porto Rico); Cat. West Indian Birds, 1892, p. 111 (Porto Rico).—Bowditch, Auk, 1903, p. 13 (Porto Rico, locally common).

Spermestes cucullata, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 597 (Porto Rico, specimens).—Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 285 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 111-112 (Porto Rico, specimens).—Struthers, Auk, 1923, p. 477 (Mayagüez).

Spermestes cucullatus cucullatus, Danforth, Journ. Dept. Agric., 1926, Vol. X, pp. 108-109 (western Porto Rico).

Porto Rico, locally common; introduced from western Africa.

The hooded weaver-finch seems to have been long established in Porto Rico, since Bryant obtained specimens which he recorded in 1866; Sundevall received a number from Hjalmarson, and Gundlach in the seventies reported the species from Mayagüez, Lares, Quebradillas and Vega Baja. There is in the U. S. National Museum a skin collected by

Robert Swift in the winter of 1864-1865, one of three taken at that time. How the species came to be introduced is wholly unknown, though as a hypothesis we may suppose that it was brought in during the period when slave-ships with their human freight sailed from the west coast of Africa to Porto Rico. The present species, the scarlet-cheeked weaver, and the guinea fowl are believed to have become naturalized from this source.

The hooded weaver-finch is a common resident through the coastal plain to an altitude of 600 feet, and above that elevation I noted it only at Cayey (1275 feet) and Adjuntas (1550 feet). It was found at Manatí, July 7 to 11, 1912; Bayamón, July 20 to 25; Humacao, September 3 to 9; Yabucoa, May 3 to 10; Juana Diaz, August 24 to 31; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Mayagüez, June 6; and Añasco, June 7 to 9. Records for the interior are as follows: Utuado, August 3 to 9; Adjuntas, August 13 and 14; Ciales, July 12 to 18; Comerio, July 26 to 31; Cayey, January 15 to 25; and Caguas, January 5 to 14. A series of specimens was collected.

The birds are usually found in small flocks of from ten to twenty-five near the open banks of streams, borders of fields or in grass-grown pastures. Near Cabo Rojo, where they were very common, flocks of several hundred were encountered. These tiny birds feed close together, clustering on the ripening heads of malojillo (*Panicum*) to eat the seeds. When feeding on the ground, they shift continually, so that the flocks are in continual movement. When flushed, they rise in a close flock, with low churring notes, and fly a short distance into some tree, where the flock divides into twos and threes, the birds sidling along the limbs until they are as close to each other as possible, to remain contentedly until it is time to feed again. In August the young were gathered in large flocks and were roosting at night in dense mangó trees.

In May they were breeding. A nest found near Yabucoa, May 10, was built in a small tree on a steep slope, where there was no concealment whatever, and as a result the structure was visible on all sides. The nest was located about six feet from the ground, and was constructed of grass stems, in lengths of eight or ten inches, thatched so as to make a close structure, but with the ends projecting crisscross in every direction. The top was arched over, but the nest had no finished entrance, one whole side being open, giving it a very untidy appearance. It contained one young bird about three days old, and three eggs on the point of hatching. The eggs were opaque white in color and elongate elliptical in shape. Another nest, found near Yauco on May 22, resembled this one, but was not

yet finished. Like the first one, it was bulky, loosely roofed over, and had a slovenly appearance, due to the projecting straws. It was placed in a thinly leaved tree, with no attempt at concealment. Near Cabo Rojo the last of August these birds were preparing to raise a second brood, as the earlier nestlings were by this time old enough to care for themselves.

Seeds of various grasses and a few of sedges constitute the entire food. These seeds are nearly always shelled before being swallowed.

On comparison of a good series of skins, I find that the hooded weaver-finch of Porto Rico is *Spermestes c. cucullatus* from western Africa; it shows no approach to *S. c. scutatus*.

The adult bird is black, with a metallic sheen on crown, sides of head, throat, upper breast and tail, brownish gray on back and wings, white below, with sides, under tail coverts and rump barred with black, and a distinct spot of dark metallic green on either side. Immature individuals are plain brown, grayer above and brighter below. The bill is thick and heavy, and the bird is approximately three and one-half inches long.

***Estrilda melpoda melpoda* (Vieillot)**

Scarlet-cheeked Weaver-finch, Gorrión

Fringilla melpoda Vieillot, Nouv. Dict. Hist. Nat., 1817, Vol. XII, p. 177. (Angola.²⁶)

Scarlet-cheeked weaver-finch, Danforth, Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Gorrión, Gundlach, Journ. für Ornith., 1874, p. 312 (specimen).

Hubropya melpoda, Gundlach, Journ. für Ornith., 1878, pp. 160, 174; Anales Soc. Esp. Hist. Nat., 1878, p. 206 (Añasco, Mayagüez, Cabo Rojo, specimens).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 142 (Porto Rico, specimens).—Cory, Cat. West Indian Birds, 1892, p. 113 (Porto Rico); Auk, 1892, p. 229 (Porto Rico, specimens).

Sporaeginthus melpoda, Bowditch, Auk, 1903, p. 13 (Mayagüez, Cabo Rojo Lighthouse).

Estrilda melpoda, Ridgway, U. S. Nat. Mus. Bull. 50, 1907, Pt. 4, p. 288 (Porto Rico).

Estrilda melpoda melpoda, Danforth, Journ. Dept. Agric., 1926, Vol. X, pp. 109-110 (Porto Rico).

Amandava melpoda, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 477 (Mayagüez to Yauco).—Struthers, Auk, 1923, p. 477 (Cabo Rojo, Añasco).

Southwestern Porto Rico from Añasco to Santa Isabel, locally common; introduced from western Africa.

The scarlet-cheeked weaver-finch may have been introduced in the

²⁶ According to Grote Journ. für Ornith., 1922, p. 483.

same manner as has been suggested for the hooded species. The first published record for it is that of Gundlach in 1874, who found it established on the coastal plain of Porto Rico from Añasco to Mayagüez and Cabo Rojo. There it is found today, and in addition extends beyond Yauco. In 1912 I secured specimens at Yauco from May 16 to 28, and at Cabo Rojo from August 24 to 31. The bird was seen at Mayagüez, June 6. There are in the U. S. National Museum two skins taken by Bowdish, July 23, 1901, "between Mayagüez and Cabo Rojo." A specimen in the Museum of Comparative Zoölogy received from A. Stahl and catalogued in the museum catalog in February, 1880, is marked Bayamón—a locality that, I believe, indicates merely Stahl's home and not the place of origin of this particular specimen. Potts reports the species east to Santa Isabel.

These tiny birds frequent marshes, dense, thorny thickets of the acacia known as *rallo*, and cane-fields. They are spirited little creatures, with quick, nervous movements, and, when alarmed, call continually. They are very active and climb through the bushes like titmice, their long tails adding to this resemblance. When feeding, they spread out somewhat, but, when excited, congregate closely, peering through the limbs before moving away, keeping well under cover. In the heat of the day they feed on the ground in patches of shade under the bushes. In the cane-fields they flush with quick calls, fly a few yards and then drop back out of sight. On the wing the long tail and short wings give them a quick, tilting flight, and they seldom fly far.

The ordinary call-note is a low *tsee tsee tsee*, or a low chattering call. Near Cabo Rojo, August 30, one female was seen feeding nearly grown young, regurgitating softened grass seeds from her throat for them. Bowdish noted breeding birds taken May 23 and 30, presumably at Mayagüez.

This weaver is brown above and gray below, with bright red cheeks, and a wash of darker red on rump and abdomen.

The difference in habit of life in the two weaver-finches established in Porto Rico may explain their present difference in distribution. The hooded species feeds in little companies in a manner suggestive of American goldfinches, and flies about openly through the country. It has thus become distributed through the lowlands of the entire island. The scarlet-cheeked weaver, on the other hand, is more secretive, and at any alarm disappears in the densest cover available. Its timidity prevents its wandering, except where suitable coverts are closely contiguous, and it has therefore covered in its range only a small part of the territory open to it.

Specimens that I collected are slightly darker in color than a series in the U. S. National Museum from Fernan-Vaz and have the red of the cheeks less intense. Grote²⁷ says that the bird from the vicinity of Lake Chad is paler above than the typical form, and has named it *Estrilda melpoda tschadensis* (type locality, Andali, north Adamawa). He states also that birds from "Lower Guinea" are darker than those from "Upper Guinea." The faintly darker color of the Porto Rican series when compared with specimens from Fernan-Vaz (which may represent the area called by Grote "Upper Guinea") is due possibly to the origin of the Porto Rican stock somewhere in Angola. The Porto Rican bird is identified as typical *melpoda*.

Family ICTERIDAE

Dolichonyx oryzivorus (Linnaeus)

Bobolink, Chambergro

Fringilla oryzivora Linnaeus, Syst. Nat., ed. 10, 1758, Pt. 1, p. 179. (Cuba.)
Dolichonyx oryzivorus, Pelzeln, Ornith. Brasiliens, 1870, Pt. 3, p. 199 (specimen from Porto Rico in Paris Museum).—Cory, Cat. West Indian Birds, 1892, p. 110 (Vieques).—Gundlach, Ornith. Cubana, 1893, p. 118 (Vieques).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 371 (Vieques).—Wetmore, U. S. Dept. Bull. 326, 1916, p. 113 (Porto Rico, Vieques).

Porto Rico, Vieques; casual in migration.

Pelzeln states that in the Paris Museum there is a specimen of the bobolink from Porto Rico and Cory and Gundlach record the species from Vieques. It is only casual in occurrence there in passage between its summer home in the north and its winter range in South America.

In ordinary migrant plumage the bobolink is olive-buff above streaked with black, and yellowish or buffy below. Males in breeding plumage are black with a cream-buff patch on the back of the neck, and the scapulars, lower back and upper tail coverts grayish white. The bird is about seven inches in length and has the tail feathers sharply pointed.

Agelaius xanthomus (Sclater)

Yellow-shouldered Blackbird, Mariquita, Capitán

Icterus xanthomus Slater, Cat. American Birds, 1862, p. 131. ("Mexico"= Porto Rico.)
 Yellow-shouldered Blackbird, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).
Cassicus phoeniceus, Moritz, Wiegmann Arch. Naturg., 1836, pp. 381-387 (Porto Rico).

²⁷ Journ. für Ornith., 1922, p. 483

- Icterus xanthomus*, Taylor, Ibis, 1864, p. 168 (Porto Rico).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 254 (Porto Rico, specimens).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 598 (Porto Rico).
Agelaius chrysopterus Vieillot, Nouv. Dict. Hist. Nat., 1819, Vol. XXXIV, p. 539 (St. Thomas, description).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 597 (Porto Rico, specimens).—Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 177; Anales Soc. Esp. Hist. Nat., 1878, p. 211 (Porto Rico, common).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 143 (Porto Rico, specimens).
Agelaius xanthomus, Cory, Auk, 1886, p. 221 (Porto Rico); Auk, 1892, p. 229 (Mona, Porto Rico, specimens); Cat. West Indian Birds, 1892, pp. 110, 132 (Porto Rico, Mona).—Bowdish, Auk, 1903, p. 12 (Porto Rico, Mona).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 344 (Porto Rico, St. Thomas?).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 113-115 (Mona, Porto Rico); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 330 (bones from cave, Morovís).—Struthers, Auk, 1923, p. 47 (Porto Rico).—Schmidt, Field Mus. Nat. Hist., Zool. Ser., August 10, 1926, Vol. XII, p. 151 (Mona).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 99-100 (Cartagena Lagoon, Mayagüez).

Porto Rico, common resident; Mona, apparently resident.

Cory received two skins from Mona Island collected by W. W. Brown, Jr., in 1892, and considered these as stragglers from Porto Rico. Since Bowdish found the species common there from August 9 to 21, 1901, it appears that it is resident. Two skins in the U. S. National Museum were taken by Bowdish, August 7 and 15. These (in worn plumage) do not seem to differ in any particular from skins from Porto Rico.

The yellow-shouldered blackbird is described by Taylor in 1864 as "excessively abundant."

In 1912 I noted it as follows: Quebradillas, July 2 to 6; Manatí, July 7 to 11; Bayamón, July 20 to 25; Río Piedras, December 16, 1911, to January 4, 1912; Mameyes, February 9 to 29; Humacao, September 3 to 9; Yabucoa, May 3 to 10; Salinas, April 26 to May 2; Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Mayagüez, June 6; Añasco, June 7 to 9, and Aguadilla, June 9 to 12. In the interior it was found at Lares, June 18 to July 1; Utuado, August 9; Ciales, July 12 to 18; Comerio, July 26 to 31; Caguas, January 5 to 14; and Hacienda Catalina, below El Yunque, March 2 to 11. I collected a series, and there are in the U. S. National Museum skins taken by Richmond at Arecibo, April 1 and 3, 1900, and at Utuado, April 10. In Porto Rico this blackbird is most abundant in the coastal region, extending inland along the open valleys of the larger streams. In the main it is found below an altitude of 800 feet. Lares (1200 feet) was the highest point at which it was observed, none being seen in the high

central mountain range. In fall, winter and spring, this species associates in small flocks, which travel over the country, returning at nightfall to some clump of trees or mangroves to roost. Morning and evening flights to or from these roosts are a common sight. The flocks pass with direct, though undulating flight, with an occasional flash of yellow showing in the wing. In mangrove swamps it is common to find a small group feeding in close array on the wet ground, or to encounter single individuals clambering through the branches, absorbed in their search for food. Often they are seen climbing actively up and down the long fronds of the coconut palms in oriole fashion, or walking sedately along on the ground among the cattle in the pastures.

The common call-note is a sharp *chick*, indistinguishable from that of the Porto Rican oriole; a low *chuck* is often heard. About their nests they give the sharp, staccato, scolding notes of the red-winged blackbird of the north, as they circle and wheel overhead. The males do not appear to sing a great deal, though odd, wheezy or reedlike notes, resembling those of the yellow-headed blackbird, are sometimes heard.

The breeding season is in May or June, the young being out of the nest by the end of the latter month; sometimes they nest as early as March. The nests of this species appear to be built usually in coconut or royal palms (Pl. LVI), as noted years ago by Moritz, the birds nesting, as a rule, in small colonies, though single pairs are sometimes found. When the nest is in a royal palm, the male spends much time resting on the tall projecting spike in the crown, where he postures with drooping wings and spread tail, but sings very little. When alarmed, the female flies up and clings to the side of the spike, just below him, while both scold vigorously at any intruder. All of the nests that I observed were in the axils of the long leaves. Gundlach says that the birds lay four eggs. In the breeding season they feed usually near the site of the nest, walking about on the ground, sometimes wading in the shallow water of the small streams or in drainage ditches. As soon as the young are on the wing, all gather in small flocks, remaining at first near the nesting colony, but going farther afield as they get stronger on the wing. They avoid the intense heat of the middle of the day by frequenting coffee plantations, clumps of bamboo and shaded perches of all kinds.

In mixed flocks with the Porto Rican grackle this blackbird feeds in newly plowed fields, following the plow for the grubs and insects exposed; it frequents cane-fields while the growth is small. In this way it does much good. Around Manati large flocks of old and young frequented citrus groves, feeding on the ground and flying up to perch

in close flocks among the branches of the trees, preferably on dead limbs. In spring, with the other blackbirds, they frequent the bucare trees (*Erythrina* sp.) to probe the handsome blossoms for their nectar.

Roughly estimated, nine-tenths of the food of this bird is animal and one-tenth vegetable. Numbers of harmful insects are destroyed. Injurious weevils are favorite food, cutworms are much relished, and a host of other insects, with a few spiders, make up the remainder. Of vegetable matter a little more than one-half is composed of corn taken from the ear when still in the milk. For the entire year this is a small amount, but during June some damage is done locally. In some instances it was found that the birds, though flocking in the cornfields, were not touching the grain. Throughout the season, as a whole, this blackbird is a beneficial species and should be allowed a small toll of grain grown by man as part payment for its usefulness throughout the rest of the year. Care should be taken not to confuse the work of blackbirds in the cornfields with that of rats, which are in some cases very destructive to the grain in localities frequented by the blackbirds. The blackbird merely pecks open the end of the ear and pulls off the kernel, while the rat gnaws off the husks, dropping a pile of refuse to the ground below and frequently destroying half the ear.

Male and female of the yellow-shouldered blackbird are identical in color, being black with yellow shoulder patches. Young in juvenile plumage resemble adults but are duller-colored.

Vieillot reported this species from St. Thomas, but I believe this record to be erroneous, as no one since has found the bird living on that island. The specimen in question must have been taken by Maugé, and so in all probability came from Porto Rico.

***Icterus portoricensis* Bryant**

Porto Rican Oriole, Calandra, Calandria

Icterus dominicensis portoricensis Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 254. (Porto Rico.)—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 597 (Porto Rico, specimens).

Porto Rican Oriole, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Oriolus dominicensis, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 203, 273-274 (Porto Rico).

Icterus dominicensis, Taylor, Ibis, 1864, p. 167 (Porto Rico).

Icterus wagleri, Bello, Zool. Gart., 1871, p. 349 (listed).

Xanthornus portoricensis, Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 176-177; Anales Soc. Esp. Hist. Nat., 1878, p. 210 (Porto Rico).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 143 (Porto Rico, specimens).

Icterus portoricensis, Cory, Auk, 1886, p. 217 (Porto Rico); Auk, 1892, p. 229 (Porto Rico, specimens); Cat. West Indian Birds, 1892, pp. 110, 132 (Porto Rico).—Bowdish, Oölogist, 1900, p. 73 (not seen on Vieques); Auk, 1903, p. 12 (Porto Rico, Vieques?).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, pp. 272-273 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 115-117 (Porto Rico, habits, food); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 330 (bones from caves, Morovís).—Struthers, Auk, 1923, p. 477 (frequent).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 100-101 (Porto Rico, habits).

Porto Rico, common resident.

The Porto Rican oriole is universally distributed throughout the island where there is tree growth suitable as feeding ground, shelter for its nests and protection from its few enemies. Near the coast it is common in the long fronds of the coconut palms, where these grow in plantations, while inland it frequents coffee plantations or tracts of second-growth forest. It is found also in citrus groves, amid trees in some of the town plazas and in the shade trees of suburban homes.

Bones of the oriole were noted in cavern deposits near Morovís.

As indication of the general distribution of the oriole, I may mention that in 1912 I found it at Quebradillas, July 2 to 6; Manatí, July 7 to 11; Bayamón, July 20 to 25; Río Piedras, December 11, 1911, to January 4, 1912; Mameyes, February 9 to 29; Humacao, September 3 to 9; Yabucoa, May 3 to 10; Maunabo, May 11; Juana Diaz, August 17 to 22; Salinas, April 26 to May 2; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Mayagüez, June 6; Añasco, June 7 and 8, and Aguadilla, June 9 to 12. In the interior the oriole was noted at Lares, June 18 to July 1; Maricao, May 29 to June 5; Utuado, August 3 to 9; Adjuntas, August 10 to 16; Ciales, July 12 to 18; Comerio, July 26 to 31; Aibonito, January 26 to February 5; Caguas, January 5 to 14; Cayey, January 15 to 25; and the Hacienda Catalina, below El Yunque, March 2 to 11; Bowdish in one account has recorded it as found on Vieques, but in an earlier statement says that it does not occur there. There is no definite record of it outside of Porto Rico proper.

The oriole is at times rather wild and keeps well concealed, but again comes into shade trees about houses. It feeds slowly through the tips of limbs, examining the leaves carefully, especially those that are curled for caterpillars, at need swinging head down to reach some desired point. This bird has the most beautiful song of any Porto Rican species—a clear whistle of several notes, pitched rather high in the scale. Its notes are uttered mainly morning and evening, and are among the few bird sounds to be heard by those afoot at dawn. The ordinary call is an

oriole-like *chick* or *chuck*, but these birds also utter a thin, high note like *pe-ee*, that resembles the call-note of a goldfinch or siskin.

The breeding season for the oriole extends from the beginning of May to the middle of July, and after the middle of June young in first plumage are common. The adults then begin to molt. This species breeds while in immature dress. The only nest found was in a grove of coconut palms, north of Manatí, on July 8, swung from the underside of one of the long leaves, the nest being supported under the center of the rib by four radiating straps that attached it firmly, leaving only a small space between it and the underside of the midrib to serve as an entrance. It appeared to be woven strongly of fibrous materials. Bowdish describes a nest seen at Aguadilla as woven from fibrous strips of palm leaf. Gundlach reports that the oriole lays three eggs.

The oriole is fond of the sweet flower juices of plants and trees, the bucare (*Erythrina*) being visited frequently when in blossom, while the abundant nectar of the banana is a great attraction, several birds visiting the same flower in rapid succession. Near Aibonito the oriole was seen eating the pulp and juice of over-ripe wild sweet oranges (*chinas*), and had opened half a dozen on one tree. As the fruit in the cultivated groves is picked long before it reaches this stage, the bird could do no damage to the citrus industry. Its food, as shown by stomach examination, consists mainly of animal matter, and it consumes many grasshoppers, roaches, caterpillars and weevils. It is considered a highly beneficial species.

The adult Porto Rican oriole is between seven and eight inches in length, black with yellow epaulettes, rump and under tail coverts. Male and female are alike in color. The immature bird is rich orange-brown throughout, brighter below. Individuals in transition plumage to the adult dress are common. The first, or juvenal plumage, is browner than the first fall dress. It is my belief that the birds keep the immature stage until they are a year old—as I saw breeding individuals in this plumage—and then molt into adult feather. The change seems to come irregularly as regards season, since I have seen molting birds from March to July. The dark feathers appear first on head and throat and extend gradually back over breast and back.

This species is closely allied to the oriole of Santo Domingo.

***Icterus icterus ridgwayi* (Hartert)**

Troupial

- Xanthornus icterus ridgwayi* Hartert, Nov. Zool., 1902, Vol. IX, p. 299. (Aruba, Dutch West Indies.) Aus den Wanderj. eines Naturf., 1902, p. 279 (reprint of above; bird mentioned from St. Thomas).
- Icterus cayennensis?*, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, p. 39 (Danish Islands).
- Icterus vulgaris*, Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 176; Anales Soc. Esp. Hist. Nat., 1878, p. 209 (Quebradillas, introduced).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 143 (Porto Rico, specimen).—Ridgway, Proc. U. S. Nat. Mus., 1884, Vol. VII, p. 172 (St. Thomas, specimen)—Hartert, Nov. Zool., 1902, Vol. IX, p. 275 (St. Thomas, mentioned).
- Icterus icterus* Cory, Auk, 1886, p. 219 (Porto Rico, St. Thomas, introduced); Cat. West Indian Birds, 1892, pp. 110, 146 (Porto Rico; St. Thomas, specimens).—Hartert, Ibis, 1893, p. 298 (St. Thomas).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 624. (Porto Rico, St. Thomas, introduced).—Bowditch, Auk, 1903, p. 12 (Porto Rico, listed).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 116-117 (Aibonito).
- Icterus icterus harterti* Cory, Field Mus. Nat. Hist., Ornith. Ser., October, 1909, Vol. I, No. 5, p. 201. (Described as new from St. Thomas.)

Porto Rico, St. Thomas; said to have been introduced.

Gundlach states that he found the troupiial established and breeding in fair numbers in the vicinity of Quebradillas. As the species was kept commonly as a cage-bird, he assumed that the original stock had escaped or had been released from captivity. Stahl had a specimen from Porto Rico and states that the species came originally from Venezuela. On January 5, 1912, below Aibonito, I saw an oriole that was not *Icterus portoricensis* and that I assumed to be the species here under discussion. Unfortunately, this bird was not collected.

The species is well known as a resident of St. Thomas. Benedict and Nye collected one there between January 17 and 24, 1884, and Cory had several specimens from that island. There are two in the U. S. National Museum, and one in the Museum of Comparative Zoölogy, taken on St. Thomas by F. A. Ober. The bird is mentioned from that island by Hartert.

Through the kindness of Mr. W. E. Clyde Todd I have borrowed from the Carnegie Museum eight skins of *Icterus i. icterus* and *I. i. ridgwayi*. The last mentioned is distinguished from typical *icterus* by longer bill and paler coloration, the culmen from base in *icterus* (irrespective of sex) ranging from 26.0 to 29.0 mm., and in *ridgwayi* from 31.5 to 33.2 mm. The three measured from St. Thomas have the culmen from base

33.2, 32.0 and 33.6 mm. respectively, and so resemble *ridgwayi*. They are, however, decidedly lighter yellow, less orange, throughout. The difference, if constant, is sufficient to warrant separation of the bird from St. Thomas as a distinct form—for which Cory (see synonymy above) has proposed the name *I. i. harterti*—and throws some doubt on the belief that the troupial has been introduced on that island. The matter of subspecific recognition of the St. Thomas bird is left in abeyance pending further examination of specimens.

A skin from Jamaica with the culmen 31.0 mm. long is also pale in color. It is identified as *ridgwayi* on the basis of size.

No skins have been seen from Porto Rico; records from that island are, therefore, included under *ridgwayi* merely as a matter of convenience.

The troupial in both sexes has the head and entire throat, back, wings and tail black, breast, abdomen, a broad band around the hindneck, lower back and rump, yellow or orange yellow, and a broad band on the wing white.

***Holoquiscalus niger brachypterus* (Cassin)**

Porto Rican Grackle, Porto Rican Blackbird, Mozambique, Chango, Pichon Prieto

Quiscalus brachypterus Cassin, Proc. Acad. Nat. Sci. Philadelphia, 1866, Vol. XVIII, p. 406. (North side of Porto Rico.²⁸)—Cory, Auk, 1886, p. 224 (Porto Rico); Cat. West Indian Birds, 1892, pp. 111, 132, 147 (Porto Rico).—Bowditch, Oölogist, 1900, p. 73 (Vieques, common); Auk, 1903, p. 12 (Porto Rico, habits).

Porto Rican Blackbird, Danforth, Oölogist, 1922, p. 10 (mention); Bird-Lore, 1922, p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Cassicus quiscula, Moritz, Wieg. Arch. Naturg., 1836, p. 381 (Porto Rico).

Quiscalus barita, Taylor, Ibis, 1864, p. 168 (Porto Rico, abundant).

Quiscalus crassirostris, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 598 (listed).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 255 (listed).

Chalcophanes lugubris, Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 598 (Porto Rico, specimens).

Chalcophanes brachypterus, Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith., 1878, pp. 160, 177-178; Anales Soc. Esp. Hist. Nat., 1878, p. 213 (Porto Rico, abundant).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 143 (Porto Rico, specimens).

²⁸ There is no indication of type locality in the original description other than Porto Rico. The statement above has been made by Peters from the fact that Cassin described this species from sixteen specimens in the Smithsonian Institution (and one without label in the Philadelphia Academy), these being from the north side of the island.

- Holoquiscalus brachypterus*, Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 229 (Porto Rico).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 117-120, Pls. 8-9 (Porto Rico, habits, economic status); Auk, 1916, p. 419 (Vieques, specimens); Auk, 1917, p. 62 (Culebra, questionable occurrence); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 331 (bone from cave, Morovís).—Struthers, Auk, 1923, p. 477 (Porto Rico, nesting).
- Holoquiscalus niger brachypterus*, Todd, Ann. Carnegie Mus., 1916, Vol. X, p. 280 (Porto Rico).—Peters, Auk, 1921, pp. 445-446 (Porto Rico, Vieques, Culebra).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 102-104, Fig. 41 (Porto Rico, habits).

Porto Rico and Vieques, common resident. Of questionable record for Culebra.

The grackle (Pl. LXV) is one of the most characteristic birds of the cultivated fields of Porto Rico and is distributed in suitable country over the entire island. In the lowland fields, below five hundred feet altitude, it is the most common species of bird; at higher points individuals are encountered in small numbers. I found it at Quebradillas, July 2 to 6; Manatí, July 7 to 12; Bayamón, July 7 to 11; Río Piedras, December 16, 1911, to January 4, 1912; Mameyes, February 9 to 29; Humacao, September 3 to 9; Yabucoa, May 3 to 10; Maunabo, May 11; Patillas, May 12 to 13; Juana Diaz, August 17 to 22; Salinas, April 26 to May 2; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Mayagüez, June 6 and 7; Añasco, June 8 and 9; Aguadilla, June 10 to 12. In the interior single birds were seen at Maricao, May 29 to June 5. Grackles were tolerably common at Lares, June 18 to July 1; Utuado, August 3 to 9; Adjuntas, August 10 to 16; Ciales, July 12 to 18; Caguas, January 5 to 14; Cayey, January 15 to 25; Aibonito, January 26 to February 5; Comerio, July 26 to 31; Cayey, January 15 to 25; and Caguas, January 5 to 14. There are specimens in the U. S. National Museum from San Juan, Hucares, Arecibo, Ponce and Luquillo.

The grackle is usually found in small flocks, that may include from three or four to twenty-five individuals, feeding on the ground in pastures or cultivated fields. Males strut about holding head and tail high as they call squeakily, while females walk back and forth seemingly pre-occupied with a busy search for food. The tail is deeply V-shaped, a conformation that is much exaggerated in flight, when the birds seem almost deformed. In rising from the ground the tail appears at times a hindrance. Thus in flying up into a palm they may fly out past the tree, and then return, because they do not appear to be able to rise at as sharp an angle as other birds of their size. The royal and coconut palms are favorite trees, in which they spend much time either in walking up and down the broad leaf-stems or in sitting quietly in the shade. Their

ordinary call-note is a grackle-like *chuck*, or a thin, high *tee tee tee*; the song may be represented by the syllable *k' see ah-ah-h*, a wheezy effort given with spread wings and deeply V-shaped tail.

The main breeding season extends from April until August, the birds usually nesting in colonies in the royal or coconut palm (Pl. LVI), though at times choosing an isolated jobo (*Spondias mombin*) or other tree. Struthers found occupied nests at Anegado Lagoon, December 3, 1921. In the palms the nests are constructed in the large seed clusters and at the bases of the long leaves, often in close proximity to one another. Bowdish describes a nest examined at Aguadilla on July 24, 1900, as composed of grasses and bits of wild cotton, lined with rootlets and one feather. Taylor says that the egg is similar to that of other grackles, and Gundlach reports that from four to six eggs compose a set. Danforth found colonies breeding in the cat-tails at Cartagena Lagoon, building nests of grass and roots, with some mud and laying four to five eggs. These are variable in color, "but most of them have a putty-colored background marked with brownish red scrawls and blotches."

The birds are very active about their nesting colonies, continually flying back and forth, calling, singing and posturing, making a scene of the greatest animation. The work of nest-construction is carried on by the females, though the males always accompany them, strutting about on the ground as they search for material, and driving intruding males from the chosen nesting site on returning to the tree. Incubation, too, falls to the lot of the female, her spouse seemingly always following her on her expeditions for food, but when the young are hatched, both sexes care for them. After the middle of June it is a common sight to see the brownish black young following their parents, teasing for food with trembling wings, and when unnoticed protesting vigorously. In August these family parties join in small flocks that remain together until the next breeding season. These bands feed in the cultivated fields, pastures or sometimes on gravel bars in streams, where they may wade in the shallow water, turning over the leaves for aquatic insects, or, standing in water up to their bodies, splash and flutter while bathing. Danforth describes a roost of these birds in coconut palms at Peña Cortada, near Mayagüez, and says that in October, 1924, it was used nightly by 3000 birds.

The present species is widely recognized as the one most beneficial to agriculture in Porto Rico, and by good fortune it is also one of the most common. While cane and tobacco fields are being prepared for the crop, flocks of grackles follow the plow or feed in the overturned furrows,

eating the insects which are exposed. On the ground the grackles walk rapidly along, peering from side to side and following the working peons closely. Even when the cane is well grown, they may follow the rows while they are being cultivated, not only to obtain insects as food for themselves, but also for their young—at times far-distant. In the breeding season it is a common sight to see three or four flying from low-lying fields inland into the foothills with a white grub shining in each bill.

After the breeding season old and young feed much on different wild fruits, such as the icaco (*Chrysobalanus*), sapalo (*Palicourea riparia*) and moral (*Cordia nitida*). In spring they were seen taking the nectar from the bucare (*Erythrina*) and muñeco (*Cordia collococca*). Frequently birds had the throat full of this honey and the feathers of the head yellow with pollen. The fruit of the manzanillo (*Hippomane manchinella*) also was eaten to some extent.

Though the grackle eats fewer mole crickets than popular belief attributes to it, such large amounts of weevils, directly injurious to cane and other crops, are consumed that it still maintains its place in the foremost rank of the beneficial birds of Porto Rico. Nearly one-fifth of the food is composed of Orthoptera and many injurious bugs are destroyed. May beetles and white grubs are eaten voraciously and cut-worms are a favorite food. Two of the birds that I examined had eaten cattle ticks, and the birds were observed on several occasions searching the cattle for their food. Considerable numbers of lizards and amphibians are eaten and with corn form the elements in the food that one would like to see spared. Most of the grain taken is secured in the month of July, and at least one-third of it is waste grain. The grackles frequent cornfields as they do cane for the shade offered from the heat of the sun, and so may not do damage even when present in numbers. No instance of damage of any extent came to my notice, depredations being confined to a few ears of corn—a toll justified by their services in destroying harmful pests which would do much more injury if unchecked. In general, the blackbird is a beneficial bird and the protection accorded it is well merited.

Mr. Bowdish speaks of the grackle on Vieques as present in large flocks, but in March, 1912, I found it only fairly common and rather local in its distribution. On Culebra Island Don Pedro Marqués informed me that at times he saw the mozambique near Playa Brava—a record that should be substantiated before it is accepted. I saw none during my work.

The mozambique is from nine and one-half to eleven inches in length and is black with bluish or greenish sheen. The eye appears almost white.

***Molothrus atronitens* Cabanis**

Glossy Cowbird

Molothrus atronitens Cabanis, in Schomburgk, Reis. Britisch Guiana, 1848, Vol. III, p. 682. (Coast region, British Guiana.)

Molothrus sericeus, Newton, Ibis, 1860, p. 308 (Vieques, specimen).

Molothrus bonariensis, Cory, Auk, 1886, p. 220 (Vieques); Cat. West Indian Birds, 1892, p. 124 (Vieques).

Molothrus atronitens, Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 212 (Vieques).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, p. 120 (Vieques); Auk, 1916, p. 419 (Vieques).

Vieques Island; accidental.

Newton records a specimen of this cowbird obtained by Riise on Vieques Island, apparently in 1859 or 1860. The species is resident from northern Brazil and Guiana to the island of Carriacou, and recently has been naturalized in Barbados, where it has been noted by Dr. Casey Wood.

Family THRAUPIDAE

Subfamily THRAUPINAE

[*Piranga erythromelas* Vieillot ²⁹

Scarlet Tanager

Piranga erythromelas Vieillot, Nouv. Dict. Hist. Nat., 1819, Vol. XXVIII, p. 293. (Eastern North America.)

Piranga erythromelas, Cory, Cat. West Indian Birds, 1892, p. 114 (Tortola).

Tortola, of uncertain record.

In the Auk for 1891, p. 47, Cory listed the scarlet tanager as collected by Winch on the island of Antigua, in the Lesser Antilles. In his Catalog of West Indian Birds, 1892, p. 114, he does not include Antigua in his references, but does list Tortola as a place of occurrence for the species. In the Catalog Mr. Cory, for his reference to West Indian Islands, adopted three series of numbers: one for the Bahama Islands, running

²⁹ Dr. Oberholser (Auk, 1919, pp. 575-576) has proposed to use *Tanagra olivacea* Gmelin (Syst. Nat., 1789, Vol. I, Pt. 2, p. 889) for the scarlet tanager on the basis of an analysis of original references to Pennant and Latham, as given by Gmelin, which cover a bird from New York, possibly a scarlet tanager. Since Gmelin also cites as his first reference Buffon, who describes a bird from Cayenne which should not be a scarlet tanager if the locality is correct, the name *olivacea* appears to be a composite of such uncertain identity that I hesitate to accept it for use.

from 1 to 34; one for the Greater Antilles, from 1 to 17, and one for the Lesser Antilles, from 1 to 34. In assigning West Indian ranges, the three sets are distinguished by the group prefixed before each set of numbers. Under the scarlet tanager we find "Bahamas, 6, 7; Greater Antilles, 1, 6, 14, 33," which, translated by means of the numerical code indicated, reads: "Bahamas, islands of New Providence, Andros; Greater Antilles, islands of Cuba, Jamaica, Tortola," with, however, no reference for 33, since the Greater Antillean numbers stop at 17. If we consider that the numbers 14 and 33 refer to the Lesser Antilles, we may translate them as Antigua and Barbados, for both of which there are records for the species. I believe, therefore, that Cory omitted to write "Lesser Antilles" before the two numbers in question, and that Tortola is thus not intended.]

***Nesospingus speculiferus* (Lawrence)**

Porto Rican Tanager, Lloron, Verdoso, Verdedon de Especulo

Chlorospingus speculiferus Lawrence, Ibis, July, 1875, p. 383, Pl. 9, Fig. 1.³⁰ (Porto Rico).—Gundlach, Journ. für Ornith., 1878, pp. 159, 168-169; Anales Soc. Esp. Hist. Nat., 1878, p. 190 (listed); Journ. für Ornith., 1882, p. 161 (nest and eggs).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 140 (Porto Rico, specimens).

Nesospingus speculiferus, Cory, Auk, 1886, p. 199 (Porto Rico); Cat. West Indian Birds, 1892, pp. 114, 132 (Porto Rico).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 157 (Porto Rico).—Bowditch, Auk, 1903, p. 14 (listed).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 120-121, Pl. 10 (El Yunque, Cayey, Maricao); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, pp. 331-332 (bones from caves, Morovís).—Struthers, Auk, 1923, p. 477 (Maricao).

Porto Rico, resident; fairly common on the middle slopes of El Yunque, and near Maricao, formerly of wider range, but now seemingly restricted to these localities.

The Porto Rican tanager (Pl. LXV) was described by George N. Lawrence in 1875 from a specimen obtained through Gundlach, who, however, says that he has no remembrance of handling the bird. The type skin, which is in the U. S. National Museum, bears on the original label the data, "Porto-Rico, Dr. Gundlach," in Gundlach's own handwriting. Gundlach believed that the skin was one of a lot obtained by his friend and student Blanco, near Aguas Buenas and sent to the Smithsonian Institution in Washington.

Though today the Porto Rican tanager is considered one of the rarer

³⁰ The description was published in July, but the plate was issued with the October number.

birds of the island and is so restricted in range that few bird-lovers have found it in life, it seems formerly to have been quite common, since its bones outnumber the remains of all other birds in the accumulations of bird and mammal remains, supposed to have come from owl pellets, that are found in the cavern deposits near Morovís. It is my belief that the large number of *Nesospingus* in these pellet remains may be explained when it is remembered that this tanager gathers in flocks at nightfall to roost in clumps of palms, where the birds find shelter in seed clumps, axils of leaves, and the spathes surrounding seed heads or the central spike. In such situations they are easy prey for night-feeding owls. An owl might return nightly to such a roost, and inroads of this kind may have had a decided effect in reducing the numbers of the tanager.

From March 2 to 11, 1912, I found the Porto Rican tanager fairly common on the eastern and northern slopes of El Yunque above the Hacienda Catalina, ranging from the thickets and coffee plantations at seven hundred feet to the dense, dimly lighted forests at the summit of the mountain. Later, from May 29 to June 5, I noted these birds as common also about Maricao, this being the first record of the species for the western end of the island. Struthers reports them as still common at Maricao in 1923. Richmond in manuscript notes records one seen on April 12, 1900, between Utuado and Adjuntas, and I believe a small bird seen indistinctly in January, 1912, on the slopes of Mount Pelado above Cayey to have been this form. Dr. C. W. Richmond secured eight specimens on El Yunque from February 22 to March 2, 1900, while Stahl had two in his collection and sent a third to P. L. Sclater, which is now in the British Museum. In my own investigations I secured a fine series of skins and made many observations on habits.

Though in their haunts these tanagers were fairly common, to secure them was often difficult. The ordinary call-note is a sharp *chewp chewp*, repeated vigorously while the bird remains concealed in a growth of vines or in dense brush. Another note, heard less often, was a robin-like *tsweep tsweep*. As we passed along the trails, our attention was attracted by the call of one or two of these birds at a distance, or a tanager would appear suddenly in the bushes near by, scolding vigorously, but when they were silent, they were very hard to find. The few natives that are acquainted with them refer to them as "the crying birds," from their loud notes, but many living in their haunts know nothing of them. On El Yunque during the day the tanagers were spread out through the brush singly, or occasionally in flocks of a dozen or more. At night, however, they gathered in bands and resorted to certain places to roost. Above the Hacienda Catalina they used as their nocturnal retreats three

or four royal palms that grew near the summit of a ridge. Until nearly dark there would be no sign of them here. Then suddenly the thickets and patches of gonduros (*Cajanus cajan*) would be alive with the birds coming up the slopes, calling and scolding. From this low cover they went up into the palms, and, with much chattering, fighting and flying about, proceeded to settle for the night. The sexual organs in specimens that I dissected indicated that the breeding season was near.

Near Maricao, in June, all were breeding, and no flocks were seen. Here they frequented the coffee plantations almost entirely, working actively through the trees above the coffee, flying and fluttering through the twigs, to examine the leaves and undersides of the limbs, and occasionally breaking out into their loud, scolding notes. Several times I heard them singing a sweet warbling song that included many running trills. Their flight is strong and undulating, but they seldom fly for long distances, preferring to seek cover in the brush. No nests were seen, though the birds were breeding.

Gundlach reports that Stahl found in a small tree, five meters from the ground, a cup-shaped nest, beautifully formed from grass and feathers loosely placed together and lined with fine grass. The egg was white with a bluish cast, spotted with brown, especially about the larger end, the brown disappearing toward the middle of the egg, and also with spots and streaks of black. The egg measured 26 by 18.5 mm.

Three-fifths of the food of this tanager is composed of Orthoptera, weevils, bugs, moths, caterpillars and spiders with an occasional lizard or tree-toad. It also eats many wild fruits and berries and a few hard grass seeds, which perhaps are taken to aid in digestion, since no sand or gravel is eaten.

This tanager is dark olive-brown above, grayer on the head, grayish white below, with olive brown under tail coverts and a small white spot in the wing at the base of the outer primaries. Male and female are similar, except that the latter is smaller and has the base of the lower mandible little, if any, paler than the rest of the bill. In the male the base of the lower mandible is distinctly whitish.

***Spindalis portoricensis* (Bryant)**

Porto Rican *Spindalis*, Reina Mora, Tomate, Llorosa, Reinona, Llorona

Tanagra portoricensis Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 252. (Porto Rico.)—Sundevall, Öfvers, Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (listed).

Porto Rican *Spindalis*, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).

- Tanagra dominica*, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 203, 273 (listed).
- Spindalis portoricensis*, Gundlach, Journ. für Ornith., 1874, p. 159; Anales Soc. Esp. Hist. Nat., 1878, pp. 188-189 (abundant, Mayagüez, Aguadilla, Quebradillas, Aguas Buenas).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 140 (Porto Rico, specimens).—Cory, Auk, 1886, p. 197 (Porto Rico); Auk, 1892, p. 229 (Porto Rico, specimens); Cat. West Indian Birds, 1892, pp. 114, 132 (Porto Rico).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 67 (Porto Rico).—Bowditch, Auk, 1903, p. 14 (Aguadilla, Mayagüez, Las Marias).—Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 121-123 (Porto Rico, food, habits); Bull. Amer. Mus. Nat. Hist., 1922, Vol. XLVI, p. 332 (bones from caves, Morovís).—Struthers, Auk, 1923, p. 478 (Boquerón).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 108 (Porto Rico, habits).

Porto Rico, common resident; generally distributed wherever there is tree growth, but less abundant in the lowlands than in the wooded hills of the interior.

I found *spindalis* at Quebradillas, July 2 to 6 (specimens); Manatí, July 7 to 11; Río Piedras, December 16, 1911, to January 4, 1912 (specimens); above Mameyes, February 9 to 29 (specimens); Yabucoa, May 4; Patillas, May 12 to 13 (specimens); Juana Diaz, August 17 to 22 (specimens); Salinas, April 26 to May 2 (specimen); Yauco, May 16 to 28 (specimens); Cabo Rojo, August 24 to 31; Mayagüez, June 6; Aguadilla, June 9 to 12; Lares, June 18 to July 1; Maricao, May 29 to June 5 (specimens); Ciales, July 12 to 18 (specimen); Aibonito, January 26 to February 5 (specimens); Caguas, fairly common, January 5 to 14; Utuado, August 3 to 9; Adjuntas, August 10 to 16 (specimens); Comerio, July 26 to 31; Hacienda Catalina, below El Yunque, March 2 to 11; Cayey, January 15 to 25 (specimens). There are skins in the U. S. National Museum from Ponce, Fajardo and Coamo. The birds may wander about somewhat with changing season and shifting food supply, for I saw them at points where Gundlach states explicitly that he did not find them. The *spindalis* frequent patches of second-growth forests as well as the borders of coffee plantations or hedges and are seen occasionally in citrus groves. They are often unsuspicious and may alight near at hand to peer curiously out from the shelter of leaves, or again are wary and take alarm at persons seen at a distance. Where food is abundant, they are often found in flocks. Their flight is strong and undulating, the birds sweeping along in graceful curves, perhaps alighting for a minute or two and then passing on. In this manner they cover considerable ground in their search for food. The call-note is a faint *tseet*, and males give a low chattering note. I heard no song from them,

but Danforth has recorded a weak though sprightly effort heard very rarely. The breeding season extends from the end of January to the middle of June, and occasional pairs may breed later. I found young birds recently grown very common during June and July, but took them occasionally throughout the year.

Bowditch has described two nests found on June 9, 1900, near Aguadilla in trees growing in small clumps near a cleared plantation. These nests were placed about ten feet from the ground, in forks of small mangó trees, and were frail, saucer-like structures, similar to those of the rose-breasted grosbeak, and built of bits of fine vines and tendrils. They contained two and three eggs respectively and incubation had begun. The set of two, now in the U. S. National Museum, has the ground color apparently dull white, almost entirely obscured by the merging of abundant blotches and washes of walnut brown. These eggs measure 23.7 x 18.2 mm. and 24.2 x 18.0 mm.

The food of the spindalis is almost entirely vegetable and it is, without doubt, the greatest agency for the distribution of seeds in the island. The species is roving in habit and covers considerable territory, appearing wherever there is food to satisfy its voracious appetite and then passing on. That the birds do not always confine their attacks to fruit and seeds is testified by the fact that, on at least two occasions, they were seen stripping climbing vines (*Ipomea*) of their tender green leaves and eating them. At Río Piedras two came into a guanábano tree (*Anona muricata*), and in less than half an hour had almost entirely consumed two of the rough, prickly-skinned fruits, ten inches long and five inches in diameter. Near Cayey a male was seen opening a ripe wild orange (*china*) and eating the pulp and juice. On half a dozen wild trees near here about thirty oranges had been attacked in the same way. In cultivated groves the bird occurs, but was not seen doing any damage. Its work is unmistakable, as it tears a large opening in the fruit from which to extract the pulp, choosing only the ripest fruit.

The spindalis is frequently infested with a species of parasitic grub, which, though often present in numbers, in most cases does not appear to affect the vitality of the bird seriously. These grubs (the young stage of some fly) are found usually on the breast, lying just under the skin, and may occur on the abdomen and underside of the wings. One bird that I examined had about thirty of the parasites, but this was exceptional, two or three being the usual number.

The fruits and berries of the pomarosa (*Jambosa jambos*), camacey (*Miconia racemosa*), palo de perico (*Cordia corymbosa*), palo moro

(*Psychotria brachiata*), a wild fig (*Ficus laevigata*), and a parcha (*Passiflora sexflora*) are foods favored by this species.

The spindalis is not at present known to be injurious.

It is a bird of sparrow-like form, from six to six and a half inches in length. Males have the back green and the breast and throat yellow, with an orange spot on the lower throat and an orange circle around the hindneck. The head is black, with a white line over the eye and a white streak on the jaw. Females and young are dull greenish above and whitish below, streaked with dusky.

Subfamily TANAGRINAE

Tanagra sclateri (Sundevall)

Porto Rican Euphonia, Jilguero, Jilguero del País, Canario del País, Canario Criollo

Euphonia sclateri Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596. (Porto Rico).—Gundlach, Journ. für Ornith., 1874, p. 311; Journ. für Ornith., 1878, pp. 159, 169-170; Anales Soc. Esp. Hist. Nat., 1878, p. 191 (Porto Rico, habits, nest).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 140 (Porto Rico, specimens).—Cory, Auk, 1886, p. 194 (listed); Cat. West Indian Birds, 1892, pp. 113, 132 (Porto Rico).—Ridgway, U. S. Nat. Mus. Bull. 50, 1902, Pt. 2, p. 15 (Porto Rico).—Bowditch, Auk, 1903, p. 14 (Ponce, Mayagüez).

Euphonia musica, Hartlaub, Isis, 1847, p. 611 (listed).—Bello, Zool. Gart., 1871, p. 349 (listed).

Tanagra sclateri, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 123-124 (Porto Rico, habits); Auk, 1916, p. 419 (Vieques, attempt at introduction).—Struthers, Auk, 1923, p. 478 (Mayagüez).

Porto Rico; fairly common resident.

The euphonia in Porto Rico is apparently confined mainly to hilly regions and seldom comes into the level lowland stretches of the coastal plain. It has such specialized habits that a number of naturalists who have visited Porto Rico have failed to see it. Gundlach reported it as common, and in the U. S. National Museum there is one skin taken by him, with several from the Bryant collection. Bowditch during extensive field work obtained only one bird, which was killed by a boy on August 25, 1901, and given to him. A. B. Baker shot one at Caguas, January 13, 1899. Richmond did not see this species.

During 1912 I found it at Quebradillas, July 2 to 6 (specimens); Toa Alta, August 2; above Mameyes, February 23; Maunabo, May 11; Salinas, April 26 to May 2 (specimens); Juana Diaz, August 17 to 22 (specimens); Yauco, May 16 to 28 (specimens); Cabo Rojo, August 24

to 3; Maricao, May 29 to June 5 (specimens); Lares, June 18 to July 1; Utuado, August 3 to 9 (specimens); Adjuntas, August 10 to 16 (specimens); Aibonito, January 26 to February 5 (specimens); Ciales, July 15 and 17; slopes of El Yunque near the Hacienda Catalina, March 2 to 11 (specimen).

The euphonias are found in pairs or small flocks in natural forests and in the shade trees above the coffee plantations. They are rather active and hop quickly about, calling *whew* or *chit-it*, the first being a whistle and the second a scolding call. The whistle is somewhat ventriloquial in character, but, when I heard it, I found it a safe rule to search the nearest clumps of mistletoe or capitana (*Phoradendron*), the seeds of which form the food of the euphonia, and here the birds were usually discovered. Growths of this parasite bearing an abundance of ripe berries are visited time after time. The birds usually keep in the thickest parts of the clumps and are hard to distinguish from the ever-present honey-creepers. They are at times rather shy, but usually respond readily to a whistled imitation of their notes, calling and hopping about excitedly. Their flight is bounding.

In January euphonias were in pairs and were nesting by the end of February. Gundlach found a nest with young in April, placed in the branches of a mangó tree, and says that it was built like the nest of other small birds. I took young birds, May 17, near Yauco and noted them as common until the first week in July. By August 10 many of the adults had completed the molt, though some did not gain their full plumage until later.

The males have a low song consisting of the rapid repetition of a single metallic phrase, preceded by louder explosive notes, with twittering interpolations. For this and their bright colors they are prized greatly as cage birds, and about Ponce and Juana Diaz bird-catching is a regular occupation of the boys. In 1912 the birds were offered in the markets for five and ten cents apiece. In 1923 Struthers reports that they sold in Mayagüez for fifty cents each. To catch the birds a euphonia, usually a female, is shut up in a wicker cage, and a convenient perch or the top of the cage smeared with a sort of bird lime. The cage is then placed in a bush, where the captive whistles loudly, calling down others that are at freedom; or the bird-catcher holds the cage in his hand, up toward the trees, where the free birds hop about excitedly, calling and whistling loudly. The cage is then moved rapidly back and forth or carried away, the boy running quickly, when the notes of the captive, as it is jolted back and forth inside, prove too much for the others, and

they come flying down. Once they alight, their fate is sealed, and in a few minutes they are inside the cage, captives themselves. In captivity the food is almost entirely ripe bananas. The birds appear to thrive on this diet, but do not live long.

In the late fall of 1910 Mr. Reed, then Presbyterian minister at Isabel II, made an attempt, apparently unsuccessful, to introduce the euphonia into Vieques Island. Forty birds were purchased in Ponce, and of these a dozen got away on the playa as they were being landed on Vieques. The others were confined in an outbuilding and during the next few months escaped a few at a time. They remained around Mr. Reed's house for some time, as three months later a party of twelve were seen, but then disappeared.

In the stomachs of fifty-one of these birds I found the food to consist of the berries of mistletoe, known as capitana, of several species, from two to twenty seeds being present in each stomach. These seeds are small and are enclosed by an outer envelope in a thick, transparent, viscous fluid. In feeding the berry is broken and the inner portion swallowed without the outer covering. In dissecting the euphonias I found the seeds and viscous matter in the lower part of the intestines in the same condition apparently as those which still remained in the throat, though the nutritive matter had been removed by digestion. The birds act as distributors of their favorite food, as the gelatinous, stringy mucous surrounding the seeds, after passing through the alimentary canal, catches and lodges on the limbs of trees, where the seeds germinate and produce new plants. It is noticeable that the mistletoe is very abundant in the dry region of the south coast, as the seeds there are less liable to be washed to the ground by rains before the mucous dries and fastens them to the limbs than they are in regions of copious rainfall. Though mistletoe is considered injurious in some regions where it is abundant enough to kill trees so unfortunate as to act as hosts, no complaint was made of it in Porto Rico nor was any damage seen that could be attributed to it. Mistletoe was common in the trees grown as shade for the coffee, but no attempt was made to cut it out or keep it down, and infested trees were apparently healthy.

The euphonia is one of the most strikingly marked of Porto Rican birds. In the adult male the forehead, underparts, lower back and rump are deep rich yellow, the crown and hindneck bright blue, and the sides of the head, back, wings and tail metallic steel blue. Females have the yellow distinctly greenish and the steel blue replaced by dull green.

Family FRINGILLIDAE

Subfamily RICHMONDENINAE

Tiaris bicolor omissa Jardine

Carib Grassquit, Parson, Parson Sparrow, Chamorro, Gorrión, Chamorro Bicolor

Tiaris omissa Jardine, Ann. Mag. Nat. Hist., 1847, Vol. XX, p. 332. (Tobago.)
Carib Grassquit, Danforth, Oölogist, 1922, p. 10 (Porto Rico); Bird-Lore, 1922,
p. 41 (Mayagüez); Bird-Lore, 1924, p. 52 (Cartagena Lagoon).

Spermophila bicolor, Knox, Hist. Acc. St. Thomas, W. I., 1852, p. 220 (St. Thomas).

Fringilla zena portoricensis Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X,
p. 254. (Porto Rico.)

Phonipara omissa, Taylor, Ibis, 1864, p. 167 (Porto Rico).

Phonipara bicolor, Newton, Ibis, 1859, p. 147 (St. Croix).—Cassin, Proc. Acad.
Nat. Sci. Philadelphia, 1860, pp. 376-377 (St. Thomas, specimens).—
Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 596 (Porto Rico,
specimens in spirits).—Mortensen, Atlanten, June, 1909, Vol. VI, No. 66,
p. 645 (St. Croix).

Phonipara zena, Ridgway, Proc. U. S. Nat. Mus., 1884, Vol. VII, p. 172 (St.
Thomas, specimens).

Euethia bicolor, Gundlach, Journ. für Ornith., 1874, p. 312; Journ. für Ornith.,
1878, pp. 160, 173-174; Anales Soc. Esp. Hist. Nat., 1878, p. 205 (Porto
Rico, habits).—Stahl, Faun. Puerto Rico, 1883, pp. 60, 141 (Porto Rico,
specimens).—Cory, Auk, 1890, pp. 374, 375 (St. Thomas, Anegada, Virgin
Gorda, specimens); Auk, 1891, p. 48 (St. Croix); Cat. West Indian
Birds, 1892, pp. 113, 150-151 (Porto Rico, St. Thomas, Virgin Gorda,
Anegada, St. Croix).—Bowdish, Oölogist, 1900, pp. 73-74 (Vieques).—
Nicoll, Ibis, 1904, p. 576 (St. Thomas).

Euethia bicolor omissa, Ridgway, U. S. Nat. Mus. Bull. 50, 1901, Pt. 1, p. 539
(Porto Rico, St. Thomas, St. John, Virgin Gorda, Anegada, St. Croix).—
Bowdish, Osprey, 1902, pp. 45-48 (nesting, habits).

Tiaris bicolor omissa, Bowdish, Auk, 1903, p. 14 (Porto Rico, abundant).—
Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 125-126 (Porto Rico,
habits, food); Auk, 1916, p. 419 (Vieques, specimens); Auk, 1917, pp. 55,
62 (Culebra, Culebrita, specimens).—Struthers, Auk, 1923, p. 478 (Porto
Rico, nesting).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol.
X, pp. 106-107 (Cartagena Lagoon).

Porto Rico, Vieques, Culebra, Culebrita, St. Croix, St. Thomas, St.
John, Virgin Gorda, Anegada; resident, common.

The Carib grassquit is an abundant resident in Porto Rico, and in
most localities outnumbers the other species of the genus found in com-
pany with it. It was recorded in 1912 at Quebradillas, July 2 to 6;
Manatí, July 7 to 11; Bayamón, July 20 to 25; Río Piedras, December

16, 1911, to January 4, 1912; Mameyes, February 9 to 29; Yabucoa, May 3 to 10; Maunabo, May 11; Patillas, May 12 and 13; Humacao, September 3 to 9; Salinas, April 26 to May 2; Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Añasco, June 7 and 8; Aguadilla, June 9 to 12. Inland birds were noted at Maricao, May 29 to June 5; Lares, June 18 to July 1; Utuado, August 3 to 9; Adjuntas, August 10 to 16; Ciales, July 12 to 18; Comerio, July 26 to 31; Caguas, January 5 to 14; Cayey, January 15 to 25; Aibonito, January 26 to February 5; and at the Hacienda Catalina, below El Yunque, March 2 to 11. It is distributed almost universally except in the heaviest forest and occurs wherever there is cover in growing cane, along maya hedges, or in thickets, coffee plantations and second-growth forest.

The grassquits are tame, unsuspicious little birds, found in pairs or in small flocks, that fly out with a quick up and down flight to alight in plain sight or under cover in bushes. As one rides through the cane-fields at dusk, they continually flutter along ahead, so that the cane is full of their rustlings. Though common in the open fields, they are at home in dense second-growth forest. Here they work through the trees, searching the limbs like honey-creepers.

The breeding season of this species appears to extend well through the year; fully-fledged young were observed from January to June in 1912, and breeding birds were taken in every month in which I collected. Loose flocks, mainly of young birds, were encountered all through the year, while the adults were in pairs and nesting. The nests found were located in maya hedges or bushes, only a foot or so from the ground, always concealed from view. One found in a coffee plantation near Yauco, May 21, was in the midst of a thick bush, about three feet from the ground, and was made of grass and weed stalks, arched over, with a rough opening at one side. The cup within, that contained the eggs, was made of very soft, fine grasses, and the eggs themselves were four in number, whitish, heavily marked with cinnamon, lined somewhat with black. Bowdish states that he has found nests from ten inches to fifteen feet from the ground and says that the opening in the side may be large or so small as barely to permit passage of the bird. In twenty-seven complete sets he noted two containing two eggs, twenty with three eggs, two with four eggs, and three with five eggs. Three eggs in a set in the U. S. National Museum collected by Bowdish, February 25, 1901, have the ground color white, spotted and washed with walnut brown, mainly about the large end. They measure 16.0 x 13.0 mm., 16.0 x 12.6 mm. and 16.0 x 12.9 mm.

Males sing constantly all day long from a post, weed, telephone wire or some other open perch. Theirs is a harsh, emphatic little song that reminded me of that of a dickcissel. In flight they frequently changed to a slow, direct wing beat, with trembling wings and head thrown back, and sang until another perch was reached. The call-note is a low *tseet*.

The food of this species is almost entirely vegetable. Seeds of all kinds of grasses and sedges and various weeds are taken eagerly and are usually swallowed entire and ground up in the muscular gizzard with the sand which is eaten for that purpose, but may occasionally be hulled neatly before being swallowed.

The grassquit was recorded by Bowditch from Vieques Island, and there are a number of specimens in the U. S. National Museum taken on that island by Richmond. From March 16 to April 3, 1912, I found it common, at times in sheltered gullies, but more often in the little grass-grown openings amid the brush. Birds taken were about to breed. On Culebra Island from April 5 to 21, 1912, they were especially common and specimens were collected near the lighthouse on Culebrita. At this time some were breeding, but others gathered in loose flocks containing several hundred individuals. Half a dozen pairs were nesting in the tall grass about one water-hole. In addition to a series that I secured here, there are in the U. S. National Museum two obtained by A. B. Baker on February 9, 1899.

The species, it is said, is very common on St. Croix, where Mortensen states that it is known as the "parson" because of its sober dress. The Newtons note that it nested from the middle of May to the end of July. The latest record for it is that of a male in the Museum of Comparative Zoölogy taken September 14, 1914, by G. K. Noble.

The species is said to be common on St. Thomas, where it has been noted by a number of visiting naturalists and where numbers of specimens have been taken. Knox reported it here as early as 1852, under the name of "parson sparrow"; Cassin received specimens from Robert Swift; a bird from the same source is in the U. S. National Museum with others collected by Benedict and Nye from February 21 to 24, 1904, and the species was sent from there to Cory by Winch. Winch also collected the species on Virgin Gorda and Anegada. A specimen in the U. S. National Museum from the island last named was taken December 23, 1889. Another in the same collection was shot on St. John by F. A. Ober.

The male Carib grassquit is grayish olive-green, with sides of head and underparts back to the abdomen black. Females and young males are plain brownish olive-green, whitish on the abdomen.

Specimens of this species from the islands from Porto Rico to the island of Tobago have been credited to the subspecies *omissa*. I believe, however, that careful study of a proper series will show that there are two or more subspecies in this range. The birds show seasonal variation with wear in plumage that renders comparison difficult, as it leads to much confusion in the characters displayed. Particularly does confusion result from the fact that the seasons on the different islands vary so that birds shot in one month in one part of their range may not be actually comparable with specimens taken at the same time elsewhere.

***Tiaris olivacea bryanti* (Ridgway)**

Bryant's Grassquit, Gorrión, Chamorro, Chamorro Bello

Euethia bryanti Ridgway, Auk, 1898, p. 322. (Porto Rico.)

Bryant's Grassquit, Danforth, Bird-Lore, 1922, p. 41 (Mayagüez).

Emberiza olivacea, Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Rico, 1810, Vol. II, p. 204 (listed).—Moritz, Wieg. Arch. Naturg., 1836, p. 381 (listed).

Passerina olivacea, Bello, Zool. Gart., 1871, p. 349 (listed).

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Porto Rico, Vieques, Culebra; resident.

In Porto Rico Bryant's grassquit is common, but is less abundant than the related species. It is found entirely in the open, in pastures and cultivated fields, where it frequents the maya hedges or scanty growths of bushes, never living in dense thickets as the other grassquit frequently does. Small marshes covered with high grass are localities favored by it, as are brushy pastures where the grass is long. During my field work it

was found at Manatí, July 7 to 11; Bayamón, July 20 to 25 (specimens); Río Piedras, December 16, 1911, to January 4, 1912 (specimens); Mameyes, February 9 to 29 (specimens); Humacao, September 3 to 9 (specimen); Yabucoa, May 3 to 10 (specimen); Maunabo, May 11; Patillas, May 10 to 13 (specimen); Salinas, April 26 to May 2 (specimens); Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31 (specimens); Añasco, June 7 and 8; Aguadilla, June 9 to 12; Maricao, May 29 to June 5 (specimen); Lares, June 18 to July 1; Utuado, August 3 to 9; Adjuntas, August 10 to 16; Ciales, July 12 to 18; Comerio, July 26 to 31; Aibonito, January 26 to February 5; Caguas, January 5 to 14 (specimens); Cayey, January 15 to 25 (specimens); and Hacienda Catalina, below El Yunque, March 2 to 11. There are skins in the U. S. National Museum from San Juan, Cataño, Luquillo and Arroyo. From their choice of open haunt these grassquits are more common in the lowlands and foothill regions than in the higher hills of the interior, which have too much cover to suit their needs. Through the year they occur in small flocks that may comprise a family group or again may include fifteen or twenty individuals. When flushed, they fly with undulating flight to the nearest maya hedge or thicket, and then work rapidly away or, if not disturbed, drop down again to the ground to continue feeding. In the cane-fields as the laborers advance in cutting the crop, the grassquits retreat to adjacent pastures and hedges, ready to spread out again through the cane when the new growth is tall enough to shelter them. Gundlach says that in his time they came about the crude sugar mills then in operation to eat the sugar as it was manufactured.

Males sing constantly all day long, from some elevated perch, an insect-like trill which cannot be heard very far. The ordinary call-note is a faint *tseep*.

The breeding season apparently extends through the entire year. Most of the nests are placed low, usually in the grass bordering a ditch or other depression, or in fields where the grass is tall. They are formed like balls of fine grasses, with an entrance in the side. One found near Hacienda Catalina, on the lower slopes of El Yunque, on March 4, 1912, contained three eggs, white with a greenish tinge, spotted with cinnamon brown, the spots forming a slight wreath about the large end of the egg. Gundlach reports from two to three eggs in a set. Struthers found a nest containing eggs at Maricao on November 22, 1921. Bones of this species were identified in cavern deposits near Morovís. The bulk of the food of this species consists of grass seeds, as crab grass (*Syntherisma*

sanguinalis) and other common species of grasses, with occasionally a few seeds of sedge (*Fimbristylis*) or star grass (*Hypoxis*).

On Vieques Island Bowdish found this species in 1899, and specimens were collected there by A. B. Baker, February 7, 1899, and by C. W. Richmond, March 22, 1900. From March 16 to April 3, 1912, I found this grassquit common and collected a number. I saw a few along roads running through the cane-fields, but found most of them in the pastures in mixed flocks with the Carib grassquit. None of those taken were breeding. Bowdish reports a laying female shot on November 30, 1899.

On Culebra Island I collected a male on April 8, 1912, which was the only one seen, though search was made for others.

Bryant's grassquit is only slightly more than four inches in length. Males are greenish olive above and grayish olive below, with the throat and a stripe over the eye bright yellow and the forehead, cheeks and breast black. Females are paler, with a yellow line over the eye and a faint suggestion of yellow on the throat and black on the foreneck. Young in first plumage are often similar to *Tiaris b. omissa*, but are paler and slightly smaller.

Subfamily CARDUELINAE

Loxigilla portoricensis (Daudin)

Porto Rican Grosbeak, Gallito, Churri, Capitán, Come Gandul

Loxia portoricensis Daudin, Trait. Orn., 1809, Vol. II, p. 411. (Porto Rico).—Ledru, Voy. Iles Ténériffe, Trinite, Saint Thomas, Sainte-Croix et Porto-Ricco, 1810, Vol. II, pp. 203-204 (Porto Rico).—Bryant, Proc. Boston Soc. Nat. Hist., 1866, Vol. X, p. 254 (Porto Rico).—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 587 (listed).

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1923, p. 478 (Porto Rico).—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, pp. 107-108 (Porto Rico, habits).

Porto Rico, common resident.

The Porto Rican grosbeak is an inhabitant of thickets that is found on the coastal plain where there is suitable cover, but through force of circumstances it is more common in the hilly interior of the island, since extensive regions suited for its habitation are there available. Gundlach noted it at Furnias, Quebradillas, between Arecibo and Utuado, Jayuya and Aguas Buenas. In 1912 I found it at Quebradillas, July 2 to 6; Manatí, July 7 to 11; Río Piedras, December 16, 1911, to January 4, 1912; Salinas, April 26 to May 2; Juana Diaz, August 17 to 22; Yauco, May 16 to 28; Cabo Rojo, August 24 to 31; Mayagüez, June 6; Aguadilla, June 9 to 12; Maricao, May 29 to June 5; Lares, June 18 to July 1; Utuado, August 3 to 9; Ciales, July 12 to 18; Comerio, July 26 to 31; and Aibonito, January 26 to February 5. There are in the U. S. National Museum specimens from Mayagüez, Aguadilla, Las Marias, Lares and El Yunque. The bird is seemingly rare in the eastern third of the island, as the only record is that of one taken on El Yunque by Richmond, February 25, 1900. The grosbeak frequents coffee plantations or thickets, where it feeds on the ground and, when alarmed, slips rapidly away through the bushes, keeping well under cover. Only occasionally, in little-frequented localities, does it feed in the open. The flight is quick and tilting, and the birds are often seen dodging across from one patch of cover to the next. Males fly up into the tops of the trees and, keeping concealed in the leaves, sing a loud cardinal-like song. But for the number heard, one would consider them rather rare birds, so well do they keep hidden. This is one of the few birds of the island that sings constantly. The ordinary call-note is a low *tseet*.

The grosbeak nests rather irregularly throughout the year, the main period falling between February and the end of June. Struthers reports a nest from Mayagüez containing three eggs on March 18, 1921. One nest seen near Salinas was placed on a horizontal limb about thirty feet from the ground. One found, June 26, near Lares was in the top of a bent-over coffee tree, about five feet from the ground and, though large and bulky, was almost entirely concealed. The foundation was of dried banana leaves, above which sticks, grass and weed stems were built up to form a deep cup, lined with grass and rootlets. This nest contained three eggs. Bowdish describes a nest found, June 15, 1900, near Aguadilla. It was placed in a clump of twigs, eight feet from the ground, against the trunk of a small tree growing in a mass of bushes. The

nest was of weed and vine stems and dead leaves and was domed. The three eggs, now in the U. S. National Museum, have the ground color white with a faint cast of dull green, and are marked finely with lilac and walnut brown over the entire surface, the marking having a faint tendency to be drawn in short, fine lines more or less longitudinal to the long axis of the egg. These eggs measure 22.9 x 17.0 mm., 22.6 x 16.8 mm. and 22.6 x 17.0 mm. respectively.

Young are most abundant in July and August, when the adults are in molt, and males almost cease to sing. The young of this species pair when they are full-grown, often before they are in fully adult plumage.

At Lares it was claimed by some that this bird was responsible for damage to the coffee crop by stripping the berries for the sweet pulp surrounding them, but this I did not observe. In dense shrubbery I noted individuals sometimes scratching in the leaves to uncover food. It was surprising to see how well the black color of the males protected them in the dense shadows; only when in motion could their forms be made out, even though they were only a few feet away. They were observed eating various wild fruits, such as the icaco (*Chrysobalanus*) manzanillo (*Hippomane manchinella*), pomarosa (*Jambosa jambos*), and sapalo (*Palicourea riparia*). In their stomachs I found weevils and other insects and many seeds.

This species is about six and one-half inches in length. Adults are black, with chestnut-brown throat and foreneck, crown and under tail coverts. The young are brownish olive, with rufous under tail coverts.

[*Spinus cucullatus* (Swainson)]

Red Siskin, Dominiquito

Carduelis cucullata Swainson Zool. Illustr., November, 1820, Vol. I, Pl. 7. (Spanish Main=north coast of Venezuela.³¹)—Sundevall, Öfvers. Kongl. Vetensk.-Akad. Förh., 1869, p. 597 (listed).

Pyrrhomitris cucullata, Gundlach, Journ. für Ornith., 1874, pp. 306, 312; Journ. für Ornith., 1878, pp. 160, 174-175; Anales Soc. Esp. Hist. Nat., 1878, p. 207 (specimen in coll. Hjalmarson; cage-bird).—Cory, Auk, 1886, p. 207 (Porto Rico, listed); Cat. West Indian Birds, 1892, p. 111 (Porto Rico, listed).

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Sundevall received a specimen of this South American species from Hjalmarson and included it as from Porto Rico. Gundlach informs us,

³¹ See Todd, W. E. C., Ann. Carnegie Mus., Vol. XVII, 1926, p. 41.

however, that this was a cage-bird. The red siskin has no valid standing in the Porto Rican list, since all records refer to this one individual.]

Subfamily EMBERIZINAE

***Ammodramus savannarum borinquensis* Peters**

Porto Rican Grasshopper Sparrow, Gorrión, Chamorro

Ammodramus savannarum borinquensis Peters, Proc. Biol. Soc. Washington, May 23, 1917, Vol. 30, p. 95. (Cabo Rojo, Porto Rico.)—Danforth, Journ. Dept. Agric. Porto Rico, 1926, Vol. X, p. 105, Fig. 42 (Cartagena and Guánica lagoons).

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Coturniculus savannarum savannarum, Ridgway, U. S. Nat. Mus. Bull. 50, 1901, Pt. 1, pp. 206-207 (Porto Rico).

Coturniculus savannarum intricatus, Wetmore, U. S. Dept. Agric. Bull. 326, 1916, pp. 127-129 (Porto Rico, food, habits).—Struthers, Auk, 1923, p. 478 (Manatí).

Porto Rico; resident, of local distribution, confined principally to the coastal plain.

Gundlach secured a specimen of the grasshopper sparrow near Bayamón in July, Bowdish recorded it from San Juan, Aguadilla and Mayagüez, and in the U. S. National Museum is a skin taken near Caguas, January 12, 1899, by A. B. Baker. In 1912 I found a colony near Yabucoa on May 10 and collected a small series. From July 20 to 25 I found the species common in the extensive pastures bordering the Bayamón River, near Bayamón, and from August 24 to 31 noted it as fairly common near Cabo Rojo. Struthers records it near Manatí, January 14, 1922; Danforth, at Cartagena and Guánica lagoons; Potts, at various localities from Arroyo to Ponce. I have identified bones of this species from cavern deposits near Morovís.

The grasshopper sparrow in Porto Rico, as in the United States, is so quiet and inconspicuous that it is not readily noted. It frequents pastures or waste land (Pl. LVIII), where grass and weeds furnish low cover, and has been restricted in range in recent years through increase in the land area put under cultivation, as it does not adjust itself readily to changes in its chosen haunts.

As one passes through these haunts, the birds usually skulk to one side in the grass or fly with weak flight for a short distance only to drop again into cover. On the ground they creep along through the grass where it is open, or hop about, stretching up their heads to peer about and flirting their tails nervously. The song of the males, a weak effort that may be represented by the syllables *tsick tsee—ee—ee—ee*, is an insect-like succession of sounds, with the first syllables sharp and quick. When known, it usually attracts attention to the birds, which otherwise would be overlooked. The song is ventriloquial, the first part seeming to come from one side and the last from another. As a result, it is usually some time before the birds are located. They sing from a weed or other perch a foot or so above the ground, where their light-colored breasts betray their presence.

The grasshopper sparrow seems to nest from May to August, and it would appear that two broods are raised. Breeding birds were taken at Yabucoa in May, and young in juvenile dress were shot at Bayamón in July and near Cabo Rojo in August. Bowdish describes a nest noted near San Juan Bay as placed in a depression in a clump of grass, built of fine grasses with a domed top. It contained three eggs similar to those of the grasshopper sparrow of the United States. He took another set of three fresh eggs near Aguadilla, June 16, 1900. Danforth found a nest containing eggs at Cartagena Lagoon, May 23, 1924.

Adults in July and August were in worn plumage, some having the rectrices much abraded or even broken, but were not yet molting. Males were still singing and varied their usual effort with another song, a series of low, twittering notes even harder to locate than the usual effort. Their call-note is a low *tsip*.

Two-thirds of the food of the grasshopper sparrow is composed of Orthoptera, small beetles and other insects, and the remainder of grass, sedge and other small seeds.

The grasshopper sparrow is about four and three-fourths inches in length, with whitish throat and abdomen and a buffy breast. The crown is blackish with a distinct median stripe of buffy, and the upper parts are blackish, with a mingling of buff and rusty brown that is especially

prominent on the hindneck. The young in first plumage have the breast finely streaked with dusky and lack the mixture of rusty brown above.

In 1916 I listed the grasshopper sparrow of Porto Rico under the name *intricatus*, a form described by Hartert from Haiti. I did this on the basis of probability, though no specimens from Haiti were available at the time for comparison. Peters, with comparable material at hand, has shown that the Porto Rican birds are distinct from those of Haiti, being more similar to those of Jamaica, from which they differ in smaller size and darker buff. Birds from all localities are darker buff in fresh fall plumage than in the breeding season.

[*Melospiza lincolni* (Audubon)]

Lincoln's Sparrow

Fringilla lincolni Audubon, Birds Amer. (folio), 1834, Vol. II, Pl. 193. (Near mouth of Natashquan River, Quebec.)

Melospiza lincolni lincolni, Danforth, Auk, 1925, p. 562 (La Plata, seen).

The Lincoln's sparrow is listed by Danforth, who states that he saw one, December 14, 1923, in a brush pile near La Plata, Porto Rico. The record is unusual, because Porto Rico is far from the normal winter range of this North American species. As it was not collected, the bird is included here in brackets—a treatment in which Mr. Danforth concurs.]

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- HARTERT, ERNST
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1842. *Nouveau Voyage aux isles de l'Amerique, contenant l'Histoire Naturelle de ces Pays, l'Origine, les Moeurs, la Religion and le Gouvernement des Habitans anciens and modernes*. New edition, 8 vols. Paris. (Mention of birds on Vieques and St. Croix in Vol. VII.)

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1875. Descriptions of Five New Species of American Birds. *Ibis*, pp. 383-387, Pl. 9. (*Chlorospingus speculiferus* on p. 383, described and figured.)
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LOWE, P. R.

1908. On the Ground-Dove of Porto Rico, with notes on the other species of *Chamaepelia*. *Ibis*, pp. 107-115. (*Chamaepelia portoricensis* on p. 108 described as new species, type locality Guánica, P. R.,

February, 1907. On page 115 are given notes on *Chamaeopelia exigua* Riley from Mona Island.)

1912. Observations on the Genus *Coereba*, together with an annotated list of the species. *Ibis*, pp. 489-528, with map and one colored plate. (*Coereba portoricensis* on p. 512 is given from Porto Rico, Vieques, Culebra, St. Thomas and the Virgin Islands; slight differences between Porto Rican and Virgin Island birds are noted.)

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1898. A Catalogue of the Birds of the West Indies which do not occur elsewhere in North America north of Mexico. Newtonville, 1898 (actual date of issue, December 1, 1903), small 8vo., pp. 1-40. (A nominal check-list printed on one side of the page.)

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1836. Notizen zur Fauna der Insel Puertorico. Wiegmann's Arch. für Naturg., pp. 373-392. (Short notes on various birds.)

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1909. Dyrelivet [Dansk Vestindien]. Atlanten, Medlemsblad for Foreningerne "De Danske Atlanterhavsoer," Vol. V, No. 66-67, pp. 639-651, June and July. (General account of birds, mainly of St. Croix.)
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1912. A Revision of the Forms of the Great Blue Heron (*Ardea herodias* Linnaeus). Proc. U. S. Nat. Mus., Vol. 43, pp. 531-559, December 12.
- PELZELN, AUGUST VON
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1917. The Porto Rican Grasshopper Sparrow. Proc. Biol. Soc. Washington, Vol. 30, pp. 95-96, May 23. (Description of *Ammodramus sacannarum borinquensis*.)
1921. A Review of the Grackles of the genus *Holoquiscalus*. Auk, pp. 435-453. (*Holoquiscalus niger brachypterus* from Porto Rico, Vieques and Culebra.)
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1899. Puerto Rico Honey Creeper. Auk, p. 361. (Note on nesting.)
- RICHMOND, C. W.
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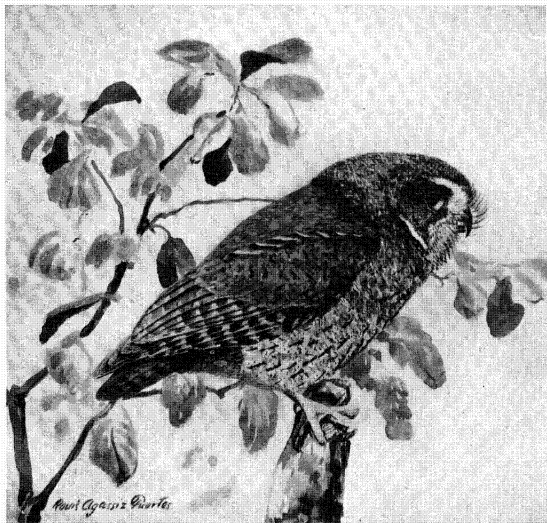
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1872. Observations on the Systematic Position of the Genera *Peltops*, *Eurylaemus* and *Todus*. Ibis, pp. 177-180, April.

1885. On Some Little Known Species of Tanagers. *Ibis*, pp. 271-272. July. (*Nesospingus*, p. 273, is proposed as a new genus and *Chlorospingus speculiferus* Lawr.)
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1887. Beitrag zur Vogelfauna von Portorico. *Ornis*, Vol. III, pp. 448-453. (A brief review of the bird life of the island attributing 154 species to Porto Rico.)
- STRUTHERS, PARKE H.
1923. Observations on the Bird Life of Porto Rico. *Auk*, pp. 469-472. (Records for a period of eighteen months from Western Porto Rico, Mona and Desecheo.)
- SUNDEVALL, CARL J.
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1869. Öfversigt af fogelslägtet Dendroeca. Öfversigt af Kongl. Vetenskaps-Akad. Föreläsningar, pp. 605-618.
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1864. Five Months in the West Indies. Part II, Martinique, Dominica, and Porto Rico. *Ibis*, pp. 157-173. (Notes on forty-eight species, including references to thirty-one observed in Porto Rico.)
- TODD, W. E. C.
1925. Two New Birds for Porto Rico. *Auk*, p. 282. (First record for *Dendroica v. virens* and *Oporornis philadelphia*.)
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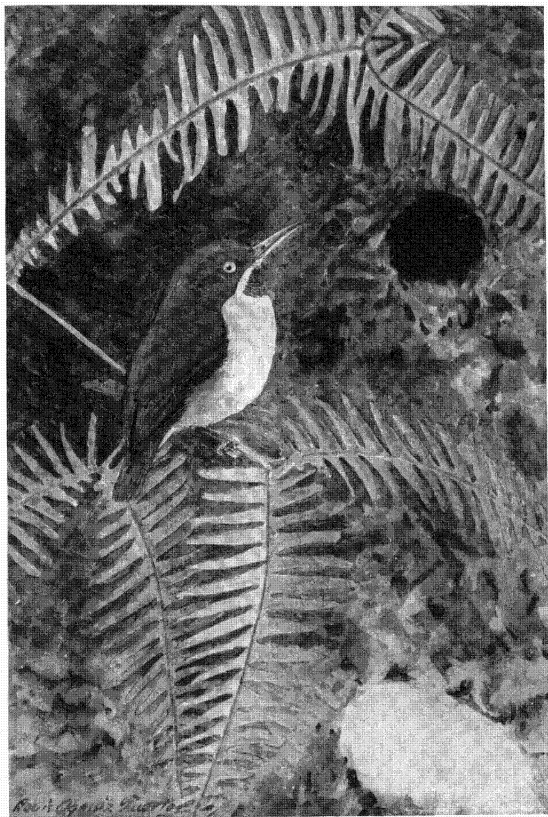
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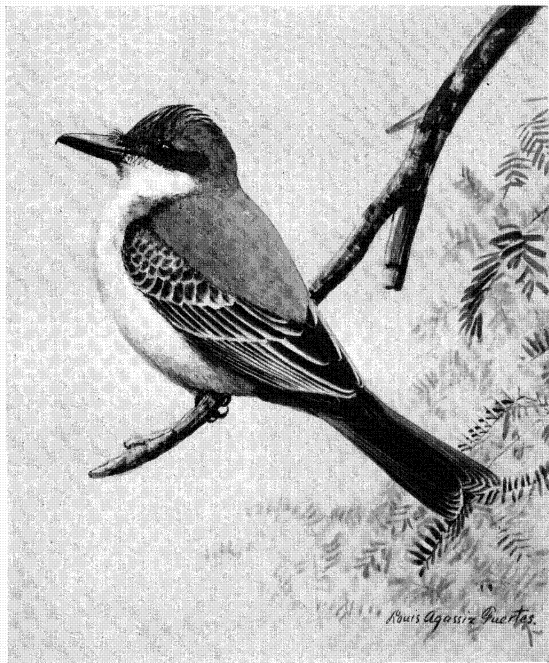
BARE-LEGGED OWL, OR MUCARO (*Gymnasio nudipes nudipes*)
(Courtesy of Biological Survey, U. S. Dept. Agric.)





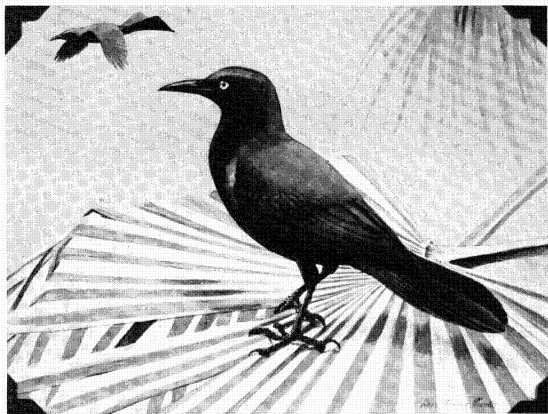
PORTO RICAN TODY, OR SAN PEDRITO (*Todus mexicanus*)
(Courtesy of Biological Survey, U. S. Dept. Agric.)



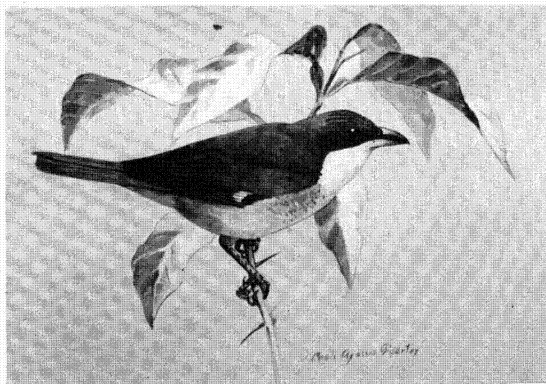


GRAY KINGBIRD, OR PITIERE (*Tyrannus dominicensis dominicensis*)
(Courtesy of Biological Survey, U. S. Dept. Agric.)





PORTO RICAN BLACKBIRD, OR MOZAMBIQUE (*Holoquiscalus niger brachypterus*)
(Courtesy of Biological Survey, U. S. Dept. Agric.)



PORTO RICAN TANAGER, OR VERDOSO (*Nesospingus speculiferus*)
(Courtesy of Biological Survey, U. S. Dept. Agric.)



INDEX FOR VOLUME IX

MAMMALS

- Academy of Natural Sciences of Philadelphia, 24
Achatillo, cave, 9
Aceratocnus, 155-179, 193, 194
 major, 159-194
 odontrigonus, 155-194
Adjuntas, 5, 59, 60, 64, 67
aedium, *Plagiodontia*, 136, 139, 141, 144, 145
Agassiz, A., submarine topography, 203
Aguadilla, 6
Aguas Buenas, 45
Aguti, 198
Aibonito, 64
Allen, Dr. G. M., 7
 expedition, 6
 work of, 12
Allen, Dr. J. A., 7, 13
Alterodon, 202
Amblyrhiza, 129, 198, 202, 204
Anthony, Edith I., 8
Anthony, H. E., work of, 13
Antillean fauna, derivation of, 222
antillensis, *Homopsomys*, 149-155
antillularum, *Tadarida*, 62
Aphaetracus, 202
aquaticus, *Scalopus*, 93
Arawaks, 10, 12, 198
Ardops, 44, 214
Arecibo, 6
Ariteus, 44
Armadillo, 198
Artibeus, 17, 18, 38, 47, 48
 jamaicensis jamaicensis, 13, 38, 44-48
 jamaicensis parvipes, 48
 perspicillatus, 12, 44
 undatum, 43
Artifacts, human, 12
bahamensis, *Tadarida*, 62
Barbour, T., distribution of reptiles and amphibians in Antillean area, 217, 218
Barn-owl, 12
Barrio de las Torrecillas, 7
Bat guano, 10, 11
Bats, 11, 12
Basal Eocene, 93, 95, 201
Bayamon, 6, 30, 32, 52
Bequaert, Dr. J., 18
bidens, *Heptaxodon*, 130-134
blatinvillii, *Mormoops*, 12, 13, 25-29
Blarina, 81, 84
 brevicauda, 93
Boaz, Dr. Franz, work of, 4
bombifrons, *Erophylla*, 13, 52-55
 Phyllonycteris, 52
Bonner, Judge, 7
boothi, *Chilonycteris parnellii*, 21
Boromys, 198, 202
Brachyphylla, 38, 39, 47
 cavernarum, 13, 35-39, 44, 47
Bradypus, 158
branicikii, *Dinomys*, 111, 113, 115, 116, 118, 120, 122, 123, 124
brasiliensis, *Nyctinomys*, 62
brevicauda, *Blarina*, 93
Britton, Dr. N. L., endemic flora of West Indies, 222
Brotomys, 198, 202
brownii, *Capromys*, 147, 204
Cabo Rojo, 5, 9, 12, 59, 60, 136
Caguana, caves of, 9
Capromys, 109, 136, 140, 141, 142, 143, 144, 145, 146, 152, 202, 204
 brownii, 147, 204
 melanura, 136
 melanurus, 141, 146
 pilorides, 140, 141, 142, 143, 144, 145, 146, 153, 202
 thoracatus, 141, 204
Caribs, 12
Carnivora, 199, 200
 list of, found in Lesser Antilles, 212
Castoroides, 129
Catedral, cave, 9, 11, 21, 32, 33, 39, 58, 70
cavernarum, *Brachyphylla*, 35-39, 44, 47
Caves, list of localities where found, 7, 9
Cayey, 6, 9, 19, 30, 32, 35, 45
Celba, cave, 9, 136, 147, 155
Centetes, 76, 78, 80, 81, 82, 84, 88, 89, 91, 92
 ecaudatus, 93
Centetidae, 88, 90, 92, 93
Chaplin, Dr. James P., 8
Chapman, Dr. F. M., avifauna endemic to West Indies, 215, 216
Chilonycterinae, 18
Chilonycteris, 21, 24, 25, 29
 fuliginosa, 24 . . .
 fuliginosa inflata, 13, 21-25
 macleayii, 12, 21, 24
 macleayii grisea, 24
 macleayii inflata, 21
 parnellii boothi, 21
 parnellii portoricensis, 13, 18-21, 23
 torrei, 24
Chinchillidae, 129
Chiroptera, 10, 12, 223
 list of, found in Greater Antillean area, 208
 list of, found in Lesser Antilles, 212

- Chrysochloris*, 86
trevelyani, 93
Claes, 99, 131, 136, 151, 153, 156
cinnamomea, *Mormoops blainvillii*, 25, 28
cinnamomeum, *Lobostoma*, 25
Clara, cave, 9, 70, 130
claudi, *Rhynchocyon*, 93
Clidomys, 129, 198, 202
clinedaphus, *Monophyllus*, 35
Coamo, 6
Comerio, 45
Corozal, 9, 35, 45
Corynorhinus, 59
coypu, *Myopotamus*, 111, 113, 115, 116, 118, 120, 122, 123, 124
Crampton, Dr. H. E., 7
Crocidura, 77, 78, 80, 81, 82, 84, 89, 91, 92, 96
nyansae kivu, 77, 86, 93
rubicunda, 93
cubanus, *Monophyllus*, 32
cubensis, *Eptesicus fuscus*, 58
Cuniculidae, 134

Dasyprocta, 152, 154, 203
Dasyproctidae, 152, 154, 155
Deer, 198, 199
Desmodus rufus, 44
Didelphys, 203
Dilambdodonta, 95, 96
Dinomyidae, 98, 129, 134
Dinomys, 109, 118, 129, 202
brantickii, 111, 113, 115, 116, 118, 120, 122, 123, 124
dobsoni, *Microgale*, 93
dorsatus, *Erethizon*, 111, 113, 115, 116, 118, 120, 122, 123, 124
Drytomomys, 129
Dutcher, Major Basil Hicks, 7

Ichimyidae, 104, 134, 147, 154
Echimyinae, 134, 154, 202
ecaudatus, *Centetes*, 93
Edentata, 10, 155, 199, 205, 214, 223
list of, found in Greater Antillean area, 206
list of, found in Lesser Antilles, 211
edithae, *Nesophontes*, 68-93
Elgenmann, G. H., origin of fresh-water fishes of Cuba, 219
Elastodontomys, 11, 98, 104, 107, 109, 116, 118, 128, 129, 130, 133, 198, 202
obliquus, 98-130
El Yunque, 5, 8
Endemic genera, 13
" species, 13
Enterrian, 202
Eocene, 92, 94, 95, 201, 202
Eptesicus, 6
fuscus cubensis, 58

Eptesicus fuscus miradorensis, 58
fuscus wetmorei, 13, 55-59
Erethizon, 129, 130
dorsatus, 111, 113, 115, 116, 118, 120, 122, 123, 124
Ericulus telfairi pallescens, 93
Erinaceidae, 82
Erinaceus, 77, 78, 80, 81, 84, 86, 89, 91
europaeus, 93
Erophylla, 52, 55
bombifrons, 13, 52-55
sezekorni, 52
Euchloeops, 194
europaea, *Talpa*, 93
europaeus, *Erinaceus*, 93

Fari, cave, 9, 19, 21, 22, 25, 30, 32, 35, 52, 55
Forests, 9
fortis, *Molossus*, 13, 62, 64-68
Fossils, probable age of, 9
frater, *Monophyllus*, 13, 32, 33-35, 44
fuliginosa, *Chilonycteris*, 24

geayi, *Procapromys*, 202
Geocapromys, 202
thoracatus, 146, 204
Glossophaginae, 29
Golondrinos, cave, 9
grandis, *Loncheres*, 155
Granger, Mr. Walter, 7
Gregory, Dr. W. K., work of, 93, 95
grisea, *Chilonycteris macleayii*, 24
Ground-sloth, 4, 7, 11
Guanica, 6
Guano, bat, 10, 11
Gundlach, Dr. Juan, work of, 6, 12, 25
Gymnura, 77, 78, 80, 81, 89, 91
rafflesii, 93

Habits of,
Artibeus, 48
Chilonycteris fuliginosa inflata, 25
Molossus fortis, 67
Monophyllus portoricensis, 32
Mormoops blainvillii, 29
Noctilio leporinus mastivus, 17
Tadarida murina, 63
Hacienda Catalina, 45
Jobo, 5, 9, 70, 147, 155
Hapalops, 155, 194
Hemicentetes, 78, 80, 82, 84, 88
semispinosus, 93
Heptaxodon, 130, 132, 133, 134, 202
bidens, 130-134
Heptaxodontidae, 130, 134
Heptaxodontinae, 130
Heteropsomyinae, 154

- Heteropsomys*, 147, 149, 151, 152, 153, 154, 155, 202
insulans, 147-149, 151
Hill, R. T., stratigraphy of Jamaica, 196
Homopsomys, 149, 151, 152, 154, 155, 202
antillensis, 149-155
Hydrochoerus, 109
Hystriocola, 154
- inflata*, *Chilonycteris fuliginosa*, 13, 21-25
Chilonycteris macleayii, 21
Insectivora, 10, 68, 84, 88, 89, 94, 96, 199, 201, 205, 214, 223
list of, found in Greater Antillean area, 207
insulans, *Heteropsomys*, 147-149, 151
Isolobodon, 9, 10, 12, 134, 140, 141, 142, 143, 144, 145, 146, 202
portoricensis, 13, 134-147
Ithyodontia, 202
- jamaicensis*, *Artibeus jamaicensis*, 13, 38, 44-48
- Kitchen-middens, 5, 198
Kivu, *Crociodura nyansae*, 77, 86, 93
- Lago, Don Sexto, cave on property of, 9
Lagomorphs, 199
Lares, 5, 6, 9, 25, 45, 58, 67
leporinus, *Noctilio*, 15, 17
Leptictidae, 92
Lobostoma cinnamomeum, 25
Loncheres, 155
grandis, 155
longirostris, *Nesophontes*, 74
Lucas, Dr. F. A., 8
Lucera, cave, 9
luciae, *Monophyllus*, 35
Luquillo, 64
Lutz, Dr. F. E., origin of spiders of West Indies, 220
- Maceira, Señor R. F., collection of, 6
macleayii, *Chilonycteris*, 12, 21, 24
Macroscelides, 86
rozeti, 93
macrotis, *Nyctinomus*, 62
Tadarida, 62
major, *Acratocnus*, 159-194
Phyllonycteris, 13, 32, 44, 48-52
Mameyes, 64
Manatí, 5, 6, 59, 136
Maricao, 55
Marmosa, 203
Marsupialia, list of, found in Lesser Antilles, 211
mastivus, *Noctilio leporinus*, 13, 14-18, 38
Vespertilio, 14
- Matthew, Dr. W. D., acknowledgment to, 7
work of, 94, 95, 200
maugeli, *Vespertilio*, 59
Mayaguez, 22, 24, 25
Megalocnus, 155, 157, 182, 194
Megalomys, 202, 203, 214
Megalonychidae, 155, 194
Megamys, 129, 202
melanura, *Capromys*, 136, 146
melanurus, *Capromys*, 141
Menotyphyla, 91
Microchiroptera, 12
Microgale, 84
dobsoni, 93
micrus, *Nesophontes*, 74
Miller, Gerrit S., Jr., 7
Miocene, 134, 201
miradorensis, *Eptesicus fuscus*, 58
Molossidae, 13, 59, 64
Molossus, 62, 63, 66, 67, 68
fortis, 13, 62, 64-68
obscurus, 12, 64
rufus, 44
Mona Island, 15
Monophyllus, 21, 29, 32, 34, 35
clinedaphus, 35
cubanus, 32
frater, 13, 32, 33-35, 44
luciae, 35
plethodon, 35
portoricensis, 13, 29-32, 34, 35, 55
Monte Grande, cave, 9
Morenia, 134
Mormoops, 12, 21, 29
blainvillii, 12, 13, 25-29
blainvillii cinnamomea, 25, 28
Morovis, 5, 9, 11, 33, 45, 49, 70, 99, 131, 147, 156
moschata, *Myogale*, 93
Mountain ranges, 8
Mungos, 205
murina, *Tadarida*, 13, 59-64, 66, 67
murinus, *Nyctinomus*, 59, 62
muscula, *Tadarida*, 59
musculus, *Nyctinomus*, 59, 62
Nyctinomus brasiliensis, 59
Museum of Comparative Zoology, expedition, 6
Myocastor, 129, 130
Myogale, *moschata*, 93
Myopotamus coypu, 111, 113, 115, 116, 118, 122, 123, 124
- Naguabo, 5, 67
Necrolestes, 201
Nesophontes, 11, 29, 44, 52, 68, 70, 74, 76, 77, 78, 80, 81, 82, 84, 85, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 198, 201
edithae, 68-93

- Nesophantes longirostris*, 74
micrus, 74
 Nesophontidae, 68, 90, 92, 93, 95, 96
 New York Academy of Sciences, expedition, 6
Noctilio, 9, 17
 leporinus, 17
 leporinus mastivus, 13, 14-18, 38
 Noctilionidae, 13, 14
 North coast, 17, 25, 38
Nyctinomus, 62
 brasiliensis, 62
 macrotis, 62
 murinus, 59, 62
 musculus, 59, 62

obliquus, *Elasmodontomys*, 98-130
obscurus, *Molossus*, 12, 64
Odocolleus, 204, 205
odontrigonus, *Acratocnus*, 155-194
 Old Loiza, 9, 15, 17, 45
 Oligocene, 201, 202
 Opossum, 198
 Origin of Mammalia, 194
 Ortman, A. E., distribution of decapods of West Indies, 221
Oryzomys, 202, 204, 214
Oryzoryctes tetradactylus, 93
 Owls, 12

Palaeoryctes, 93, 94, 201
pallescentis, *Ericulus telfairi*, 93
 Pajita, cave, 9
paradozus, *Solenodon*, 93
 Parasite of *Brachyphylla*, 39
 of *Noctilio*, 18
 Pellets, owl, 12
 Peños Lejos, caves at, 9
personatus, *Sorex*, 93
perspicillatus, *Artibeus*, 12, 44
 Phyllonycterinae, 48
Phyllonycteris, 29, 52
 bombifrons, 52
 major, 13, 32, 44, 48-52
 pocyi, 49, 50, 52
Phyllotis, 44
 Phyllostomidae, 13, 18
 Physiography, 8
 Piedra de la Cueva, 9, 17
pirarides, *Capromys*, 140, 141, 142, 143, 144, 145, 146, 153, 202
Plagiodontia, 140, 141, 143, 145, 146, 202
 aedium, 136, 139, 141, 144, 145
Plecotus, 50
 Pleistocene, 10, 92
plethodon, *Monophyllus*, 35
pocyi, *Phyllonycteris*, 49, 50, 52
 Ponce, 6
portoricensis, *Chilonycteris parnellii*, 13, 18-21

portoricensis, *Isolobodon*, 13, 134-147
 Monophyllus, 13, 29-32, 34, 35, 55
Potamogale, 80, 84
 velox, 93
 Preston ranch, 5, 67
 Primates, 199, 200
Procapromys geayi, 202
Procyon, 203
Proechimys, 104, 155
 Pueblo Viejo, 9, 22, 30, 35, 45, 52, 58

 Quebradillas, 5, 6, 9, 45

 Raccoon, 198
rafflesi, *Gymnura*, 93
Rhynchocyon, 86
 claudi, 93
 Rice-rat, 198
 Rio Piedras, 6
 Rodentia, 4, 10, 98, 199, 202, 204, 214, 223
 list of, found in Greater Antillean area, 206
 list of, found in Lesser Antilles, 211
rozeti, *Macroscelides*, 93
rubicunda, *Crociodura*, 93
rufum, *Stenoderma*, 39
rufus, *Desmodus*, 44
 Molossus, 44
 Stenoderma, 13, 39-44, 52

 Salinas, 136
 San German, 5, 9, 45, 55, 58, 59, 60, 64, 136
 San Juan, 4, 5, 9, 24
 San Miguel, cave, 9
 San Sebastian, 5
Scalopus, 86
 aquaticus, 93
 Scharff, R. F., origin of West Indian fauna, 222
semispinosus, *Hemicentetes*, 93
sezekorni, *Erophylla*, 52
 Shanton, Colonel, 7
 Shell-heaps, 4, 5, 9, 10, 12, 146
 Simpson, C. T., distribution of land mollusks on the Antilles, 220
 Sloth, 11, 182
Solenodon, 77, 78, 80, 81, 82, 84, 85, 88, 89, 91, 92, 93, 94, 198, 201
 paradozus, 93
Sorex personatus, 93
 Soricidae, 78, 82, 91, 92, 93, 95, 96
 Soricoida, 92, 95, 96
speciosa, *Tupaia*, 93
spectrum, *Vampyrus*, 17
Speozenus, 129, 202
Spirodontomys, 129, 202
 Stejneger, L., relations and origin of herpetological fauna of Porto Rico, 219
Stenoderma, 29, 43, 44

- Stenoderma rufum*, 39
rufus, 13, 39-44, 52
Stenoderminae, 35, 44
 Stone, Dr. Witmer, 7
 Strube, Mr. Leopoldo, 7
 Surveys, previous, 6
Tadarida, 58, 61, 62, 63, 64, 66, 67
 antillularum, 62
 bahamensis, 62
 macrotis, 62
 murina, 13, 59-64, 66, 67
 muscula, 59
Talpa, 91, 96
 europaea, 93
Talpidae, 78, 91, 93, 95, 96
 Tertiary, 96, 195, 197, 198, 202, 204
 limestones, fossil-bearing, 5
tetradactylus, *Oryzoryctes*, 93
Tetrastylus, 129, 202
thoracatus, *Capromys*, 141, 204
 Geocapromys, 146
 Toa Alta, 45
 Toraño, Don Gervacio, cave on property
 of, 9, 11, 151, 159
torrei, *Chilonycteris*, 24
treceyeni, *Chrysochloris*, 93
 Trujillo Alto, 9, 19, 21, 22, 25, 26, 29, 30,
 32, 35, 45
Tupaia, 77, 78, 80, 82, 86, 88, 90, 91
 speciosa, 93
undatum, *Artibeus*, 43
 Ungulates, 199, 200
 Utuado, 5, 6, 9, 11, 12, 45, 59, 60, 64, 70,
 99, 130, 136, 147, 151, 155, 159
Vampyrops, 43
Vampyrum spectrum, 17
 Vaughn, Dr. T. W., submarine topography
 of West Indies, 197
 Vega Baja, 6
velox, *Potamogale*, 93
Vespertilio maugei, 59
Vespertilionidae, 13, 55
 Wetmore, Dr. Alex., 6, 7
wetmorei, *Eptesicus fuscus*, 13, 55
 Willis B., submarine topography of West
 Indies, 197
 Yager, Governor, of Porto Rico, 7
 Zalambdodonta, 78, 80, 82, 84, 91, 93, 95,
 96
 Ziska, Mrs. Helen von, 8

BIRDS

- Accipiter striatus venator*, 320
 Acknowledgments, 269-270
Actitis macularia, 362
Actiturus longicaudus, 362
Actodromas maculata, 370
 minutilla, 369
 wilsoni, 369
acuflavida, *Sterna*, 384
 Sterna sandvicensis, 384
acufavidus, *Thalasseus*, 384
 Thalasseus sandvicensis, 384
acuta, *Dafla*, 309
acuta tsitzihoa, *Dafla*, 309
adelaidae, *Dendroica*, 515
 Adelaide's warbler, 515
adoxa, *Ardea herodias*, 288
Aegialeus melodus, 350
 semipalmatus, 351
Aegialitis meloda, 350
 semipalmata, 351
 rociferus, 353, 354
 wilsonia rufinucha, 352
 wilsonius, 352
Aesalon antillarum, 327
aestiva, *Dendroica*, 508
 Motacilla, 507
Aestrelata species, 276
atherens, *Phaëthon*, 278, 279
affinis, *Aythya*, 313
 Fuligula, 312
 Fulix, 313
 Marila, 313
 Nyroca, 312
Agelaius chrysopterus, 533
 xanthomus, 532
agulla marina, 323
 Akhurst, John, work of, 264
alba, *Casmerodius*, 290
 Crocethia, 374
 Guara, 305
 Scolopax, 305
 Trynga, 374
albeola, *Anas*, 314
 Charitonetta, 314
albifrons antillarum, *Sterna*, 382
albus egretta, *Casmerodius*, 290
 Eudocimus, 305
alcetraz, 280
Alcedo alcyon, 452
alcyon, *Alcedo*, 452
 Ceryle, 452
 Ceryle alcyon, 452
 Streptoceryle alcyon, 452
 Allen, Glover M., work of, 260

- alleni, Erismatura*, 315
atitloqua, Sylvicola, 494
 Vireo, 494
atitloquus, Vireo, 494
amabilis, Zenaida, 394
Amandava melpoda, 530
Amazona vittata, 414
 vittata gracilipes, 414
 vittata vittata, 412
American bittern, 302
 black-bellied plover, 356
 coot, 346
 egret, 290
 golden plover, 355
 wigeon, 308
americana, Anas, 308
 Compsothlypis, 505
 Fulica, 346, 348
 Fulica americana, 346
 Mareca, 308
 Parula, 505
 Sylvicola, 504
americana pusilla, Compsothlypis, 504
 usneae, Compsothlypis, 505
americanus, Charadrius plumbeus, 355
 Coccyzus americanus, 420
 Cuculus, 420
 Phaethon, 278
Ammodramus savannarum, 560
 savannarum borinquensis, 560
 savannarum passerinus, 560
anaetheta melanoptera, Sterna, 380
 recognita, Sterna, 381
anaethetus, Sterna, 380
Anas albeola, 314
 americana, 308
 arborea, 307
 bahamensis, 309
 clypeata, 312
 collaris, 313
 discors, 311
 dominica, 317
 jamaicensis, 314
 sphenosa, 317
 tzitzihua, 309
anatum, Falco, 325
 Falco peregrinus, 325
Anegada, description of, 252
ani, 425
ani, Crotophaga, 425
Anous stolidus stolidus, 385
Anthony, H. E., work of, 259, 261
anthonyi, Capella, 360
Anthracothonax aurulentus, 449
 viridis, 447
antillarum, Aesalon, 327
 Falco, 322
 Falco piscator, 324
 Myiarchus, 467
 Myiarchus stolidus, 467, 468
 antillarum, Podilymbus podiceps, 272-275
 Sterna, 383
 Sterna albifrons, 382
 Sternula, 382
 Tyrannus, 467
Antillean black swift, 439
 flycatcher, 467
 gallinule, 343
 grebe, 272
 sparrow hawk, 327
Antrostomus carolinensis, 435
 noctitherus, 436
 vociferus, 436
aquila, Fregata, 286
aquillus, Tachypetes, 286
Aramus giganteus, 334
 pictus elucis, 333
aranae, Gelochelidon nilotica, 379
 Sterna, 379
Aratinga chloroptera chloroptera, 416
 chloroptera maugei, 415
arborea, Anas, 307
 Dendrocygna, 307
Archilochus colubris, 443
Ardea caerulea, 293
 caerulescens, 293
 (*Uancrophagus*), 296
 candidissima, 291
 egretta, 290
 exilis, 303
 herodias, 288
 herodias adosa, 288
 lentiginosa, 302
 ludoviciana, 296
 naevia, 299
 nycticorax, 299
 occidentalis, 289
 Thula, 291
 tricolor ruficollis, 293
 violacea, 300
 virescens, 295, 296
 viridis, 296
Ardetta exilis, 303
ardosiacea, Mimocichla, 489
 portoricensis, Mimocichla, 489
 Turdus, 489
arenaria, Calidris, 374
Arenaria interpres, 357
 interpres morinella, 357
arenero, 374
Asio portoricensis, 434
Athene nudipes, 430
atlantica, Chen, 306
atricilla, Chroicocephalus, 376
 Larus, 376
 Larus atricilla, 377
megalopterus, Larus, 378
atronitens, Molothrus, 543
Audubonia occidentalis, 289
Audubon's shearwater, 275

- Aura, 318
aura, *Cathartes aura*, 318
 Vultur, 318
 Aura tiñosa, 318
aureus, *Charadrius*, 355
aurita, *Columba*, 398
 Zenaida, 398
aurocapilla, *Motacilla*, 523
aurocapillus, *Hemicocichla*, 523
 Seiurus, 524
 Seiurus aurocapillus, 523
 Siurus, 524
auro-capillus, *Turdus*, 523
aurulenta, *Lampornis dominica*, 450
aurulentus, *Anthracothonax*, 449
 Lampornis, 449
 Trochilus, 449
 Trochilus viridis, 449
autumnalis, *Dendrocygna*, 307
 Plegadis, 305
 Avifauna, discussion of, 265-269
Avis tropicorum, 277
Aythya collaris, 314
 affinis, 313

 Bahama duck, 309
 pintail, 309
 Bahaman nighthawk, 438
bahamensis, *Anas*, 309
 Dafla bahamensis, 309
 Poecilonetta, 309
 Baker, A. B., work of, 258-259, 262
 Baldpate, 308
 Band-tailed pigeon, Jamaican, 392
 Bank swallow, 472
 Barbequejo, 404
 Bare-eyed pigeon, 394
 Bare-legged owl, 430
 Barga, 360, 374
barita, *Quiscalus*, 539
 Barn owl, Porto Rican, 429
 swallow, 473
 Barrancolino, 453
bartholemica, *Dendroica*, 508
 Dendroica petechia, 508
Bartramia longicauda, 362
 Becasina, 358
 Beck, R. H., work of, 264
Bellona exilis, 441
 Belted kingfisher, 452
 Benedict, J. E., work of, 264
 Bibliography, 562
bicolor, *Euethia*, 552
 Hirundo, 472
 Iridoprocne, 472
 Phonipara, 552
 Spermophila, 552
 Tachycineta, 472
 bicolor omissa, *Euethia*, 552
 omissa, *Tiaris*, 552
 Bien-te-veo, 494
 Bijirita Adelaida, 515
 aplomada, 511
 coronada, 513
 de costa, 506
 de palmas, 520
 Dominica, 514
 estriada, 517
 galana, 518
 manchada, 511
 mariposera, 515
 palmera, 520
 rayada, 517
 Bittern, American, 302
 least, 303
Blacicus blancoi, 469
 latirostris blancoi, 469, 470
 Black and white warbler, 503
 Black-bellied tree-duck, 307
 Black-billed cuckoo, 419
 Blackbird, Porto Rican, 539
 yellow-shouldered, 532
 Black-capped petrel, 276
 Black-crowned night heron, 299
 Black-necked stilt, 375
 Black-poll warbler, 517
 Black rail, 339
 skimmer, 387
 swift, Antillean, 439
 tern, 385
 witch, 425
 Black-throated blue warbler, 511
 green warbler, 511, 514
 Blanco, Tomas, work of, 258
blancoi, *Blacicus*, 469
 Blacicus latirostris, 469, 470
 Contopus, 469
 Blue-breasted hummingbird, 445
 Blue pigeon, 393
 warbler, black-throated, 511
 Blue-winged teal, 311
 Bobito, 469
 Bobolink, 532
 Bob-white, 330
bonariensis, *Molothrus*, 543
 Booby, brown, 281
 red-footed, 284
borealis, *Buteo*, 321
 Numenius, 360
 Phaeopus, 360
 Scolopax, 360
borealis jamaicensis, *Buteo*, 320
bortinquensis, *Ammodramus savannarum*, 560
Botaurus lentiginosus, 302
 Bowdish, B. S., work of, 259, 261, 262
 Boyero, 402

- brachidactyla*, *Geothlypis trichas*, 525
brachidactylus, *Trichas*, 525
Brachyotus cassini, 434
brachyotus, *Striz*, 434
brachypterus, *Chalcophanes*, 539
 Holoquiscalus, 540
 Holoquiscalus niger, 539
 Quiscalus, 539
 Bridled quail-dove, 405
 tern, 380
brijectita, *Euethia*, 555
 Broad-winged hawk, 322
 Brown booby, 281
 pelican, 280
 Brown, Jr., W. W., work of, 258, 261
bryanti, *Euethia*, 555
 Euethia olivacea, 555
 Tiaris olivacea, 555
 Bryant, Henry, work of, 257
 Bryant's grassquit, 555
 Ruby, 281
 Buck Island, description of, 252
 Bufflehead, 314
 Buguere, 281
Buteo borealis, 321
 borealis jamaicensis, 320
 latissimus, 323
 pennsylvanicus, 323
 platypterus platypterus, 322
 tropicalis, 322
buteo, *Falco*, 320
Butorides virescens, 296
 virescens cubanus, 296
 virescens maculatus, 296
 virescens virescens, 295
 Caballero, 366
 chillon, 368
cabanensis, *Colinus*, 331
 Cabot's tern, 384
cachinnans, *Gallinula chloropus*, 345
caerulea, *Ardea*, 293
 Florida, 293, 294
caerulea caerulescens, *Florida*, 293, 294
caerulescens, *Ardea*, 293
 Dendroica caerulescens, 511
 Florida caerulea, 293, 294
 Motacilla, 511
 Calandra, 535
 Calandria, 535
Calidris arenaria, 374
 leucophaea, 374
calidris, *Phyllomanes*, 494
 Vireo, 494
 Vireosylva, 494
 Vireosylva calidris, 494
canadensis, *Dendroica*, 515
 Canario, 507
 criolla, 549
 Canario del país, 549
 del manglar, 507
Cancroma maculata, 296
 (*Cancrophagus*), *Ardea*, 296
 Candelita, 526
candidissima, *Ardea*, 291
 Egretta candidissima, 291
 Garzetta, 291
candidus, *Phaëthon aethereus* og, 278
 Capacho, 435, 437
Capella anthonyi, 360
 delicata, 358
 gallinago delicata, 359
 Cape May warbler, 506
 Capitán, 532, 557
Caprimulgus carolinensis, 435
 popetue, 437
 Caracara, Porto Rican, 325
Carbo mexicanus, 285
Carduelis cucullata, 559
caribaea, *Chloroenas*, 392
 Columba, 392
 Fulica, 346
caribaea major, *Fulica*, 346
caribaeorum, *Falco*, 327
 Falco sparverius, 327
 Tinnunculus, 328
caribaeus, *Rallus longirostris*, 335
 Caribbean clapper rail, 335
 coot, 346
 martin, 477
 Carib grassquit, 552
 green, 445
carolina, *Porzana*, 337
carolinensis, *Antrostomus*, 435
 Caprimulgus, 435
 Columba, 395
 Falco, 323
 Pandion, 324
 Pandion haliaëtus, 323
 Podiceps, 272
carolinus, *Rallus*, 337
coronata, *Dendroica*, 513
 Carpintero, 457
 Carrao, 333
Casmerodias alba, 290
 albus egretta, 290
 egretta, 290
Cassicus phoeniceus, 532
 quiscula, 539
cassini, *Brachyotus*, 434
castanea, *Zenaida*, 398
catesbyi, *Phaëthon lepturus*, 277
Cathartes aura, 318
Catoptrophorus semipalmatus longicaudis, 366
 semipalmatus semipalmatus, 366
caudifasciatus taylori, *Tolmarchus*, 465
 466

- cavatica*, Tyto, 429
cayana, Sterna, 383
cayennensis, Icterus, 538
 Nyctanassa violacea, 301
Centurus portoricensis, 457
cerceris, Gallinula chloropus, 345
Cerchneis sparveria, 328
 sparveria loquacula, 328
Certhia flaveola, 498, 501, 502
Certhiola flaveola portoricensis, 498
 newtoni, 502
 portoricensis, 498, 501
 sancti-thomae, 501
 S. ti Thomae, 501
Cervera, 385
Ceryle alcyon, 452
 alcyon alcyon, 452
Chaemepelia passerina exigua, 402
 passerina trochila, 398
Chalcophanes brachypterus, 539
 lugubris, 539
Chamaepelia portoricensis, 399
Chambergo, 532
Chamorro, 552, 555, 560
 belo, 555
 bicolor, 552
Chango, 539
Charadrius aureus, 355
 dominica dominica, 356
 dominicus, 355
 dominicus dominicus, 356
 melodus, 350
 mexicanus, 375
 pluvialis americanus, 355
 semipalmatus, 351
 squatarola, 356
 virginicus, 356
 vociferus, 353, 354
 wilsonia, 352
Charitonetta albeola, 314
Chelidon erythrogastra, 473
Chen atlantica, 306
 hyperboreus, 306
 hyperboreus nivalis, 306
Chicheri, 460
Chirirra, 307
Chirre, 383
 de altura, 277
Chlidonias nigra surinamensis, 385
Chlorestes gertrudis, 443
Chloroenas caribaea, 392
 inornata caesi, 393
chlorolaemus, Eulampis, 445
Chlorolampis maugaeus, 443
chloroptera, Aratinga chloroptera, 416
chloroptera maugaei, Aratinga, 415
chloropterus, Conurus, 415
chloropus Fulica, 343
 Gallinula, 344
 Hydrogallina, 343
 chloropus cachinnans, Gallinula, 345
 cerceris, Gallinula, 345
 portoricensis, Gallinula, 343
Chlorospingus speculariferus, 544
Chlorostilbon maugaeus, 443
Chordeiles gundlachii, 437
 minor, 438
 minor gundlachii, 437
 minor vicinus, 438
 virginianus, 437, 438
 virginianus minor, 437
Chorlito, 355
Chorlo, 360, 366, 368, 374
Chroicocephalus atricilla, 376
chrysis, Geotrygon, 404
 Oreopeleia, 404
chrysopterus, Agelaius, 533
Chrysotis, 412
 vittata, 412
Chuck-will's-widow, 435
Chupador de arroz, 528
Churri, 557
Cichlherminia fuscata, 486
Circus hudsonius, 323
Clérigo, 464
Cliff swallow, Jamaican, 474
Clivicola riparia, 473
clypeata, Anas, 312
 Spatula, 312
Coccyzus americanus americanus, 420
 erythrophthalmus, 419
 minor, 421
 minor dominicae, 421
 minor dominicata, 421
 minor dominicensis, 421
 minor maynardi, 421
 minor nesiotes, 421, 423
 minor teres, 421
 nesiotes, 421
 seniculus, 421
Cockroach Island, description of, 252
Coco, 304
 blanco, 305
 oscuro, 304
 prieto, 304
codorniz, 331
Coereba dominicensis, 501
 newtoni, 502
 portoricensis, 498, 501
 portoricensis portoricensis, 498
 portoricensis sancti-thomae, 501
Colibri, 443, 449
Colinus cabanensis, 331
 cubanensis, 331
 virginianus cubanensis, 331
 virginianus virginianus, 330
Coll rubio, 526
collaris, Anas, 313
 Aythya, 314
 Fulix, 314

- collaris*, Marila, 314
Nyroca, 313
colubris, *Archilochus*, 443
Trochilus, 443
Columba aurita, 398
caribaea, 392
carolinensis, 395
corensis, 389
inornata exsul, 393
gymnophthalmos, 394
lamprauchen, 392
leucocephala, 387
martinica, 404
montana, 402
mystacea, 405
passerina, 398
passeris, 398
portoricensis, 389
squamosa, 389
zenaida, 394
columbarius, *Falco columbarius*, 326
Hypotriorchis, 326
Columbigallina passerina, 398
passerina, 402
Colymbus dominicus dominicus, 271-272
podiceps, 272
thomensis, 271
Come gandul, 557
Common tern, 379
Compothlypis americana, 505
americana pusilla, 504
americana usneae, 505
Congo Cay, description of, 252
Contopus blancoi, 469
Conurus, 417
chloropterus, 415
evops, 415
gundlachi, 415
maugeli, 416
pertinax, 417
xantholaemus, 417, 418
Coot, 348
American, 346
Caribbean, 346
Coracolero, 349
Corax crucirostra, 479
corensis, *Columba*, 389
Patagtoenas, 389
Cormorant, fresh-water, 285
Mexican, 285
Cornix jamaicensis, 479
coronata, *Dendroica coronata*, 513
Motacilla, 513
Sylvicola, 513
Corredor, 352
Coturniculus savannarum savannarum, 560
Corua, 285
Coruja, 434
Corvus leucognaphalus erythrophthalmus, 481
leucognaphalus leucognaphalus, 480
pumilis, 482
coryi, *Sula*, 284
Cotorra, 412, 414
Coturniculus passerinus, 560
savannarum, 560
savannarum intricatus, 560
Cotyle riparia, 473
Cowbird, glossy, 543
crassirostris, *Quiscalus*, 539
Creciscus jamaicensis jamaicensis, 339
Cregueté, 437
crepitans, *Rallus*, 335
Crested quail, 331
Crocethia alba, 374
Crossophthalmus gymnophthalmos, 394
Crotophaga, 425
ani, 425
Crow, lesser Porto Rican, 482
Porto Rican, 479
cruciana, *Dendroica petechia*, 507
crucirostra, *Corax*, 479
Crybastus gossei, 338
Cuban green heron, 296
quail, 331
night-hawk, 437
cubanensis, *Colinus*, 331
Colinus virginianus, 331
Ortiz, 331
Ortyx, 331
Ortyx virginianus, 331
cubanus, *Butorides virescens*, 296
Cuckoo, black-billed, 419
mangrove, 421
yellow-billed, 420
cucullata, *Carduelis*, 559
Loxia, 528
Pyrrhomitris, 559
cucullata, *Spermestes*, 528
cucullatus, *Spermestes*, 528
Spermestes cucullatus, 528
Spinus, 559
cucullatus scutatus, *Spermestes*, 530
Culebra americanus, 420
dominicus, 421
erythrophthalma, 419
minor, 421
vetula, 423
Cuervo, 479
Culebra Island, description of, 251
Culebra Island parrot, 414
Curacao parquet, 417
Curlew, Eskimo, 360
Hudsonian, 360
Curlis, 360
curvirostris, *Sitta*, 463
Tyrannus, 463

- cynosurae*, *Squatarola squatarola*, 356
Cypseloides niger, 439
- Dafila acuta*, 309
acuta tzitzihua, 309
bahamensis bahamensis, 309
spinicauda, 311
- Dagareta, 342, 343
negra, 346
- Dagaretilla, 337
- Danforth, Stuart T., work of, 260-261
- de Booy, Theodoor, work of, 263, 264
- de Booy's Rail, 340
- debooyi*, *Nesotrochis*, 340
- delicata*, *Capella*, 358
Capella gallinago, 359
Gallinago, 359
Scolopax, 358
- Demigretta ruficollis*, 292
- Dendrocygna arborea*, 307
autumnalis, 307
- Dendroeca petechia cruciana*, 507
- Dendroica adelaidae*, 515
aestiva, 508
bartholemica, 508
caerulescens caerulescens, 511
canadensis, 515
coronata coronata, 513
discolor, 518
dominica dominica, 514
maculosa, 511
magnolia, 511
palmarum palmarum, 520
pensilis, 515
petechia, 508
petechia bartholemica, 508
petechia cruciana, 507
petechia portoricensis, 508
petechia ruficapilla, 508
ruficapilla, 508
striata, 517
tigrina, 508
virens virens, 514
- Desecheo Island, description of, 249
- Diablito, 528
- discolor*, *Dendroica*, 518
Sylvia, 518
Sylvicola, 518
- discors*, *Anas*, 311
Querquedula, 311
- Doctor-bird, 440, 445, 449
- Dolichonyx oryzivorus*, 532
- dominica*, *Anas*, 317
Charadrius dominica, 356
Dendroica, 515
Dendroica dominica, 514
Erismatura, 314, 318
Motacilla, 514
Tanagra, 547
- dominica aurulenta*, *Lampornis*, 450
intermedia, *Lampornis*, 449, 452
- dominicae*, *Coccyzus minor*, 421
- Dominican grebe, 271
- dominicata*, *Coccyzus minor*, 421
- dominicensis*, *Coccyzus minor*, 421
Coereba, 501
Falco, 328
Hirundo, 477
Lanius, 460
Oriolus, 535
Progne, 477
Psittacus, 412
Tinnunculus, 328
Tyrannus dominicensis, 460
- dominicensis portoricensis*, *Icterus*, 535
- dominicus*, *Charadrius*, 355
Charadrius dominicus, 356
Colymbus dominicus, 271-272
Cuculus, 421
Lampornis, 449
Nomonyx, 314, 317
Pluvialis dominicus, 355
Podiceps, 271
Podilymbus, 272
- Dominiquito, 559
- dougallii*, *Sterna dougallii*, 379
- Dove, Martinique, 398
Mona ground, 402
Porto Rican ground, 398
Zenaida, 394
- Dowitcher, long-billed, 371
- Duck, Bahama, 309
lesser scaup, 312
masked, 317
ring-necked, 313
West Indian ruddy, 314
- Duck hawk, 325
- Dysporus fiber*, 281
sula, 281
- Egret, 290
American, 290
snowy, 291
- egretta*, *Ardea*, 290
Casmerodius, 290
Casmerodius albus, 290
Herodias, 290
- Egretta candidissima candidissima*, 291
ruficollis, 292
thula thula, 291
- Elaeena martinica*, 470
- Elaenia martinica martinica*, 471
martinica riisii, 470, 471
- Elaeina pagana martinica*, 471
riisii, 470
- elliotti*, *Lampornis*, 449
- elucus*, *Aramus pictus*, 333
- Emberiza olivacea*, 555

- Emerald, Porto Rican, 443
Ereunetes himantopus, 372
 mauri, 373
 petrificatus, 372
 pusillus, 372
Erismanura alleni, 315
 dominica, 314, 318
 jamaicensis jamaicensis, 314
 jamaicensis rubida, 317
 rubida, 314
erythrogaster, *Hirundo*, 473
 Hirundo rustica, 473
erythrogastra, *Chelidon*, 473
erythromelas, *Piranga*, 543
 Piranga, 543
erythrophthalma, *Coccyzus*, 419
erythrophthalmus, *Coccyzus*, 419
 Coreus leucognathus, 481
erythrorhyncha, *Paecilonetta*, 311
erythrorhynchus, *Pelecanus*, 281
 Eskimo curlew, 360
Estrilda melpoda, 530
 melpoda melpoda, 530
 melpoda tshadensis, 532
Eudocimus albus, 305
Euthia bicolor, 552
 bicolor omissa, 552
 brijectita, 555
 bryanti, 555
 lepida, 555
 olivacea, 555
 olivacea bryanti, 555
Eulampis chlorolaemus, 445
 holosericeus, 445
Euphonia musica, 549
Euphonia, Porto Rican, 549
Euphonia sclateri, 549
Eupoda wilsonia rufo-nucha, 352
Eupsittula pertinax pertinax, 417
Eupsychortyx sonnini sonnini, 331
erops, *Conurus*, 415
erigua, *Chaemepelia passerina*, 402
exilis, *Ardea*, 303
 Ardea, 303
 Bellona, 441
 Ictobrychus exilis, 303
 Microlyssa exilis, 441
 Orthorhynchus exilis, 440
 Trochilus, 440, 442
ersul, *Chloroenas inornata*, 393
 Columba inornata, 393
falcinellus, *Ibis*, 304
 Plegadis falcinellus, 304
 Tantalus, 304
Falcinellus ordii, 305
Falco anatum, 325
 antillarum, 322
 buteo, 320
 Falco caribaeorum, 327
 carolinensis, 323
 columbarius columbarius, 326
 dominicensis, 328
 hudsonius, 323
 jamaicensis, 320
 peregrinus anatum, 325
 piscator antillarum, 324
 sparverius, 328
 sparverius caribaeorum, 327
 sparverius loquacula, 328
fedoa, *Limosa*, 374
 Scolopax, 374
 Vetula, 374
ferruginea, *Strix*, 430
festivus, *Psittacus*, 412
fiber, *Dysporus*, 281
fissipes, *Hydrochelidon*, 385
 Flamenco, 305
 Flamingo, 305
flavcola, *Certhia*, 498
 Certhiola, 501, 502
 Nectarinia, 498
flavcola portoricensis, *Certhiola*, 498
flavipes, *Gambetta*, 366
 Scolopax, 366
 Totanus, 366
flavirostris, *Phaeton*, 278
flavirenter, *Porzana flavirenter*, 339
flavirenter gossii, *Porzana*, 339
 hendersoni, *Porzana*, 338
Florida caerulea, 293, 294
 caerulea caerulea, 293, 294
Florida gallinule, 343
Flycatcher, Antillean, 467
 Porto Rican, 467
Fork-tailed hummingbird, 443
Frallecillo cabezón, 352
 melódico, 350
 sabanero, 354
Fraile miguelete, 452
Fregata aquila, 286
 magnificens, 286
 magnificens rothschildi, 286
 minor magnificens, 286
Fresh-water cormorant, 285
Frigate-bird, 286
Fringilla lincolni, 562
 melpoda, 530
 oryzivora, 532
 passerina, 560
 zena portoricensis, 552
Fulica americana americana, 346
 caribaea, 346
 caribaea major, 346
 chloropus, 343
 martinica, 342
 Sterna, 382
fuliginosa, *Haliplana*, 382

- fuliginosus*, *Onychoprion*, 382
Fuligula affinis, 312
Fulix affinis, 313
 collaris, 314
fulva, *Hirundo*, 474
 Petrochelidon, 474
fulva poeciloma, *Petrochelidon*, 474
fusca, *Sula*, 281, 284
fusca, *Cichlherminia*, 486
 Merula, 486
 Sterna fuscata, 381
fuscatus, *Margarops fuscatus*, 486
 Turdus, 486
fuscollois, *Pisobia*, 371
 Tringa, 371
fuscus, *Pelecanus*, 280

galapagensis, *Paccilonetta*, 311
galeata, *Gallinula*, 343
 Gallinula galeata, 344
 Nauvula, 332
Gallareta, 342, 346
 chiquita, 337, 338
 de agua, 343
 de cienaga, 337
 Martiniqueña, 342
 platanera, 342
Gallaretilla, 338, 339
Gallego, 376
Gallina de guinea, 332
Gallinago delicata, 359
 wilsonii, 358
gallinago delicata, *Capella*, 359
gallinago, *Sceloporus*, 358
Gallinaza, 343
Gallinazo, 346
Gallinueta, 337
Gallinula chloropus, 344
 chloropus cachinnans, 345
 chloropus cerceris, 345
 chloropus portoricensis, 343
 galeata galeata, 344
 martinica, 342
Gallinule, *Antillean*, 343
 Florida, 343
Gallito, 349, 557
Gambetta flavipes, 366
 melanoleuca, 368
Ganga, 362
gardeni, *Nyctiardea*, 299
Garling, 296
Garza, 292, 293
 azul, 293
 blanca, 291, 293
 de cuello rojo, 292
 de vientre blanca, 292
 pinta, 293
 real, 290
Garzetta candidissima, 291

Garzon blanco, 289, 290
 ceniciento, 288
 cenizo, 288
Gavilán, 325, 326
Gaviota, 376, 379, 380, 383, 384, 385
 Antillana, 382
 boba, 376
 ceniza, 385
 de pico agudo, 384
 del paraíso, 379
 forastera, 376
 negra, 385
 oscura, 381
 prieta, 385
 regla, 383
Gelochelidon nilotica, 379
 nilotica aranea, 379
Geothlypis trichas, 525
 trichas brachidactyla, 525
Geotrygon chrysis, 404
 martinica, 404
 montana, 402
 mystacea, 405
gertrudis, *Chlorestes*, 443
giganteus, *Aramus*, 334
Gilt-crested hummingbird, 440
gilvus, *Mimus*, 486
 Mimus gilvus, 485
 Turdus, 485
Ginger Island, description of, 252
Glossy Cowbird, 543
 ibis, 304
Godwit, *marbled*, 374
Golden plover, *American*, 355
 warbler, *Porto Rican*, 507
Golondrina, 439, 472, 473, 474, 477
 de cuevas, 474
 de iglesias, 477
 riberiega, 472
Goose, *greater snow*, 306
Gorrfon, 528, 530, 552, 555, 560
gossei, *Crybastes*, 338
 Laterirallus, 338
gossii, *Porzana flavireuter*, 339
gracilipes, *Amazona vittata*, 414
Grackle, *Porto Rican*, 539
Grasshopper sparrow, *Porto Rican*, 560
Grassquit, *Bryant's*, 555
 Carib, 552
Gray kingbird, 460
Great white heron, 289
Greater snow goose, 306
 yellow-legs, 368
Grebe, *Antillean*, 272
 Dominican, 271
 least, 271
Green Carib, 445
 gaulin, 296
 mango, 447

- Green warbler, black-throated, 514
 Grinnell's water-thrush, 522
griseus, *Melittarchus*, 460
 Tyrannus, 460
griseus scolopaceus, *Limnodromus*, 371
 Ground dove, Mona, 402
 Porto Rican, 398
 Grosbeak, Porto Rican, 557
 Guabairo, 435
 chico, 436
 Guanaba, 300
Guara alba, 305
 Guaraguou, 320
 de la Sierra, 320
 de sabana, 322
 Guaraiba, 436
 Guareao, 333
 Guiana mockingbird, 485
 Guincho, 323
 Guinéa, 332
 Guinea hen, 332
 Gull-billed tern, 379
 Gull, laughing, 376
 Gundlach, Juan, work of, 257-258
gundlachi, *Conurus*, 415
gundlachi, *Chordeiles*, 437
 Chordeiles minor, 437
 Gusanero, 498, 503
Gymnasio nudipes, 430, 433
 nudipes nudipes, 430
 nudipes newtoni, 433
Gymnoglaux krugii, 430
 newtoni, 433
 nudipes, 430, 433
gymnophthalmos, *Columba*, 394
 Crossophthalmus, 394

Habropyga melopoda, 530
Haematopus palliatus palliatus, 340
 Halcón, 320, 327
 de patos, 325
haliaëtus, *Pandion*, 324
haliaëtus carolinensis, *Pandion*, 323
Haliplana fuliginosa, 382
 Hark, Mrs. Hugo, work of, 263
 Hartert, E., work of, 258, 264
harterti, *Icterus icterus*, 538
 Hartlaub, work of, 256
hasitata, *Procellaria*, 276
 Pterodroma, 276
 Hawk, Antillean sparrow, 327
 broad-winged, 322
 duck, 325
 marsh, 323
 pigeon, 326
 Porto Rican sharp-shinned, 320
 West Indian red-tailed, 320
Helodromas solitarius solitarius, 365
helvetica, *Squatarola*, 356

hendersoni, *Porzana flaviventer*, 338
Henicocichla aurocapillus, 523
herodias adoxa, *Ardea*, 288
herodias, *Ardea*, 288
Herodias egretta, 290
 Heron, black-crowned night, 299
 Cuban green, 296
 great white, 289
 little blue, 293
 little green, 295
 Louisiana, 292
 snowy, 291
 West Indian great blue, 288
 West Indian green, 296
 yellow-crowned night, 300
Hians scolopaceus, 334
Hiaticula vocifera, 354
 wilsoni, 352
himantopus, *Ereunetes*, 372
 Micropalama, 371
 Tringa, 371
Himantopus mexicanus, 375
 nigricollis, 375
Hirundo bicolor, 472
 dominicensis, 477
 erythrogaster, 473
 fulva, 474
 horreorum, 473
 nigra, 439
 poeciloma, 474
 purpurea, 477
 riparia, 472
 rustica erythrogaster, 473
hirundo, *Sterna hirundo*, 379
 Hjalmarson, Justus, work of, 257
Holoquiscalus brachypterus, 540
 niger brachypterus, 539
holosericeus, *Eulampis*, 445
 Lampornis, 445
 Sericotes holosericeus, 445
 Trochilus, 445
 Honey-creeper, Porto Rican, 498
 St. Croix, 502
 Virgin Island, 501
 Hooded weaver-finch, 528
horreorum, *Hirundo*, 473
 Hudsonian curlew, 360
hudsonicus, *Numenius*, 360
 Phaeopus, 360
hudsonius, *Circus*, 323
 Falco, 323
 Hummingbird, blue-breasted, 445
 fork-tailed, 443
 gilt-crested, 440
 ruby-throated, 443
 Hurricane bird, 286
Hydranassa tricolor ruficollis, 292
Hydrochelidon flssipes, 385
 nigra surinamensis, 385

- Hydrogallina chloropus*, 343
 Martinica, 342
Hylocichla mustelina, 491
hyperboreus, *Chen*, 306
hyperboreus nivalis, *Chen*, 306
hypochondriacus, *Todus*, 454
Hypotriorchis columbarius, 326

Ibis falcinellus, 304
Ibis, glossy, 304
 white, 305
Icterus cayennensis, 538
 dominicensis portoricensis, 535
 icterus, 538
 icterus harterti, 538
 icterus ridgwayi, 538
 portoricensis, 535
 vulgaris, 538
 wagleri, 535
 xanthomus, 532
icterus ridgwayi, *Icterus*, 538
 Xanthornus, 538
inornata exsul, *Chloroenas*, 393
 Columba, 393
intermedia, *Lampornis dominica*, 449, 452
interpres, *Arenaria*, 357
 Strepsilas, 357
interpres morinella, *Arenaria*, 357
intricatus, *Coturniculus savannarum*, 560
Ionornis martinica, 342
 martinicus, 342
Iridoprocne bicolor, 472
Ixobrychus exilis exilis, 303

jacana, *Parra*, 349
Jacana spinosa, 349
 spinosa violacea, 349
Jacana, West Indian, 349
Jamaican band-tailed pigeon, 392
 cliff swallow, 474
 mockingbird, 483
 vireo, 494
jamaicensis, *Anas*, 314
 Buteo borealis, 320
 Cornix, 479
 Circus jamaicensis, 339
 Erismatura jamaicensis, 314
 Falco, 320
 Nephoecetes niger, 439
 Nyctanassa violacea, 301
 Rallus, 339
 rubida, *Erismatura*, 317
Jilguero, 549
 del país, 549
Judfo, 425
Juf, 467, 469
 pequeño, 469
Julian chiví, 492

Key West quail-dove, 404
Killdeer, 353
 West Indian, 354
Killi-killi, 327
Kingbird, 464
 gray, 460
Kingfisher, belted, 452
Knox, John P., work of, 263
Krugii, *Gymnoglaux*, 430

Labat, work of, 262
Lampornis aurulentus, 449
 dominica aurulenta, 450
 dominica intermedia, 449, 452
 dominicus, 449
 elliotti, 449
 holosericeus, 445
 virginalis, 449
 viridis, 447, 450
lamprauchen, *Columba*, 392
Lanius dominicensis, 460
 tyrannus, 464
Larus atricilla, 376
 atricilla atricilla, 377
 atricilla megalopterus, 378
larva, *Oreopeleia*, 405
latebrosus, *Polyborus*, 325
Laterallus gossei, 338
Latimer, George, work of, 257
latimeri, *Vireo*, 492
Latimer's vireo, 492
latirostris blancot, *Blacus*, 469, 470
latissimus, *Buteo*, 323
Laughing gull, 376
Least bittern, 303
 grebe, 271
 sandpiper, 369
 tern, 382
Lechuza, 320
Ledru, work of, 256
lentiginosa, *Ardea*, 302
lentiginosus, *Botaurus*, 302
lepida, *Euethia*, 555
lepturus catesbyi, *Phaëthon*, 277
Lesser Porto Rican crow, 482
 scaup duck, 312
 yellowlegs, 366
leucocephala, *Columba*, 387
 Patagioenas, 388
leucogaster, *Pelecanus*, 281
 Sula, 282
 Sula leucogastra, 281
leucognaphalus, *Corvus leucognaphalus*, 480
 erythrophthalmus, *Corvus*, 481
leucophaea, *Calidris*, 374
therminieri, *Puffinus therminieri*, 275
Limnodromus griseus scolopaceus, 371

- Limosa fedoa*, 374
scolopacea, 371
 Limpkin, 333
lincolni, *Melospiza lincolni*, 562
lincolni, *Fringilla*, 562
 Lincoln's sparrow, 562
 Little blue heron, 293
 green heron, 295
 Lizard-cuckoo, Porto Rican, 423
 Lloron, 544
 Llorona, 434, 546
 Llorosa, 546
 Long-billed dowitcher, 371
longicauda, *Bartramia*, 362
 Tringa, 362
longicaudis, *Catoptrophorus semipalmatus*, 366
longicaudus, *Actitis*, 362
longirostris caribaeus, *Rallus*, 335
 Rallus, 335
loquacula, *Cerchneis sparreria*, 328
 Falco sparverius, 328
 Louisiana heron, 292
 water-thrush, 522
 Louis Peña Island, description of, 251
Loria cucullata, 528
Loxia portoricensis, 557
lucida, *Zenaida zenaida*, 395
ludoviciana, *Ardea*, 296
Ludoviciana, *Motacilla*, 504
lugubris, *Chalcophanes*, 539

Macrorhamphus scolopaceus, 371
Macrotrastus nigricollis, 375
macroura, *Zenaidura macroura*, 395
macularia, *Actitis*, 362
 Tringa, 362
macularius, *Tringoides*, 362
maculata, *Actodromas*, 370
 Cancroma, 296
 Pisobia, 370
 Spatula, 312
 Tringa, 370
maculatus, *Butorides virescens*, 296
maculosa, *Dendroica*, 511
magnificens, *Fregata*, 286
 Fregata minor, 286
magnificens rothschildi, *Fregata*, 286
magnolia, *Dendroica*, 511
 Sylvia, 511
 Magnolia warbler, 511
major, *Fulica caribaea*, 346
major, *Symphemia semipalmata*, 366
 Mango, green, 447
 Porto Rican, 449
 Mangrove cuckoo, 421
 Man-o'-war bird, 286
 Manx shearwater, 276
 Marbled godwit, 374

Mareca americana, 308
margaritaceus, *Trochilus*, 449
Margarops fuscatus fuscatus, 486
Marila affinis, 313
 collaris, 314
 marina, agulla, 323
 Mariquita, 532
 Marsh hawk, 323
 Martin, Caribbean, 477
 Martin pescador, 296, 452
martineca, *Elaenia*, 470
 Martinete, 296, 303
 Martinete chico, 303
martinica, *Columba*, 404
martinica, *Elaenia pagana*, 471
 Elaenia martinica, 471
 Fulica, 342
 Gallinula, 342
 Geotrygon, 404
 Hydrogallina, 342
 Ionornis, 342
 Porphyrio, 342
 Tyrannula, 470
martinica riisi, *Elaenia*, 470, 471
martinica, *Zenaida*, 398, 404
martinicus, *Ionornis*, 342
 Martinique dove, 398
 Maryland yellowthroat, 525
 Masked duck, 317
Matacella pusilis, 508, 515
 Matraca, 452
maugaeus, *Chlorolampis*, 443
 Chlorostilbon, 443
 Trochilus, 443
maugei, *Aratinga chloroptera*, 415
Conurus, 416
 Psittacara, 415
 Sporadinus, 443
mauri, *Ereunetes*, 373
maxima, *Sterna*, 383
marinus, *Thalasseus marinus*, 383
maynardi, *Coccyzus minor*, 421
 Medio peso, 453
megalopecterus, *Larus atricilla*, 378
Melanerpes portoricensis, 457
melanogaster, *Trochilus*, 449
melanoleuca, *Gambetta*, 368
 Sceloporus, 368
melanoleucus, *Totanus*, 368
melanopectera, *Sterna*, 380
 Sterna anaetheta, 380
melanotos, *Pisobia*, 370
 Tringa, 370
meleagris, *Numida*, 332
Melittarchus griseus, 460
meloda, *Aegialitis*, 350
melodus, *Aegialeus*, 350
 Charadrius, 350
Melospiza lincolni lincolni, 562

- melpoda*, *Amandava*, 530
Estrilda, 530
Estrilda melpoda, 530
Fringilla, 530
Habropyga, 530
Sporaeoginthus, 530
melpoda tshadensis, *Estrilda*, 532
Mernula fuscata, 486
 Method of treatment, 270-271
 Mexican cormorant, 285
mexicanus, *Carbo*, 285
Charadrius, 375
Himantopus, 375
Phalacrocorax olivaceus, 285
Phalacrocorax nigra, 285
Todus, 453
Micropygia exilis exilis, 441
Micropalama himantopus, 371
 Milligan, J. W., work of, 259, 262
Mimocichla ardosiaea, 489
ardosiaea portoricensis, 489
plumbea, 489
Minus gilvus, 486
gilvus gilvus, 485
polyglottus, 483
polyglottus orpheus, 483
polyglottus portoricensis, 483
minor, *Chordeiles*, 437, 438
Chordeiles virginianus, 437
Coccyzus, 421
Cuculus, 421
minor dominicae, *Ooccyzus*, 421
dominicata, *Coccyzus*, 421
gundlachii, *Chordeiles*, 437
magnificens, *Fregata*, 286
maynardi, *Coccyzus*, 421
nestotes, *Coccyzus*, 421, 423
teres, *Coccyzus*, 421
virginus, *Chordeiles*, 438
minutilla, *Actodromas*, 369
Pisobia, 369
Tringa, 369, 372
mistacea, *Motacilla*, 525
Mniotilta varia, 503
 Mockingbird, *Guiana*, 485
Jamaican, 483
Molothrus atronitens, 543
bonariensis, 543
sericeus, 543
 Mona ground dove, 402
 Mona Island, description of, 249
montana, *Columba*, 402
Geotrygon, 402
Oreopeleia, 402
morinella, *Arenaria interpres*, 357
Tringa, 357
 Moritz, C., work of, 256
 Mortensen, Th., work of, 263, 265
Motacilla aestiva, 507
Motacilla anrocapilla, 523
caerulescens, 511
coronata, 513
dominica, 514
ludoviciana, 504
mistacea, 525
noveboracensis, 520
palmarum, 520
ruticilla, 526
tigrina, 506
umbria, 513
varia, 503
virens, 514
motacilla, *Seiurus*, 522
Turdus, 522
 Mourning warbler, 525
 Mozambique, 539
Múcaro, 430
Múcaro de Melón, 434
Múcaro de sabana, 434
Múcaro real, 434
musica, *Euphonia*, 549
Muscicapa olivacea, 494
ruticilla, 526
striata, 517
tyrannus, 460
mustelina, *Hylocichla*, 491
mustelinus, *Turdus*, 491
Myiarchus antillarum, 467
stolidus antillarum, 467, 468
 Myrtle warbler, 513
mystacea, *Columba*, 405
Geotrygon, 405
Oreopeleia mystacea, 405
naevia, *Ardea*, 299
naevius notabilis, *Seiurus*, 522
naevius, *Nycticorax nycticorax*, 299
Nectarinia flaveola, 498
 ? *Nephocaetes*, 439
Nephocaetes niger, 439
niger jamaicensis, 439
niger niger, 439
nestotes, *Coccyzus*, 421
Coccyzus minor, 421, 423
Nesospingus speculiferus, 544
Nesotrochis debooyi, 340
 Newton, Alfred and Edward, work of, 262-263, 264
newtoni, *Certhiola*, 502
Coereba, 502
Gymnasio nudipes, 433
Gymnoglaux, 433
 Newton's owl, 433
 Nichols, J. T., work of, 260
 Nicoll, M. J., work of, 263, 264
niger, *Cypseloides*, 439
Nephocaetes, 439
Nephocaetes niger, 439

- niger brachypterus*, *Holoquiscalus*, 539
jamaicensis, *Nepheocetes*, 439
 Nighthawk, Bahaman, 438
 Cuban, 437
nigra, *Hirundo*, 439
 Rynchops nigra, 387
nigra surinamensis, *Chlidonias*, 385
 Hydrochelidon, 385
nigricollis, *Himantopus*, 375
 Macrotarsus, 375
nilotica, *Gelochelidon*, 379
nilotica aranea, *Gelochelidon*, 379
Nisus pennsylvanicus, 322
nivalis, *Chen hyperboreus*, 306
 Noble, G. K., work of, 263
noctithera, *Setochoalcis*, 436
noctitherus, *Antrostomus*, 436
Noctua nudipes, 430
 Noddy, 385
Nomonyx dominicus, 314, 317
 Northern parula warbler, 504
 yellowthroat, 525
notabilis, *Seiurus naevius*, 522
 Seiurus noveboracensis, 522
noveboracensis, *Motacilla*, 520
 Seiurus, 520, 522
 Seiurus noveboracensis, 520
noveboracensis notabilis, *Seiurus*, 522
nudipes, *Athene*, 430
 Gymnasio, 430, 433
 Gymnasio nudipes, 430
 Gymnoglaux, 430, 433
 Noctua, 430
 Strix, 430
nudipes newtoni, *Gymnasio*, 433
Numenius borealis, 360
 hudsonicus, 360
Numida galeata, 332
 meleagris, 332
 ptilorhyncha, 333
Nyctanassa violacea, 301
 violacea cayennensis, 301
 violacea jamaicensis, 301
 violacea violacea, 300
Nyctherodias violaceus, 300
Nyctiardea gardeni, 299
nycticorax, *Ardea*, 299
Nycticorax nycticorax naevius, 299
 violaceus, 300
 Nye, W., work of, 264
Nyroca affinis, 312
 collaris, 313
 Ober, F. A., work of, 264
occidentalis, *Ardea*, 289
 Audubonia, 289
 Pelecanus occidentalis, 280
 Pelecanus onocrotalus, 280
Ochthodromus wilsonius, 352
 wilsonius ruftnuchus, 352
Ocniscus virescens, 296
olivacea, *Emberiza*, 555
 Euethia, 555
 Muscicapa, 494
 Passerina, 555
 Tiaris, 555
 Vireosylva, 497
olivacea bryanti, *Euethia*, 555
 Tiaris, 555
olivaceus, *Phyllomanes*, 497
 Vireo, 497
 Vireo, *olivaceus*, 494
olivaceus mexicanus, *Phalacrocorax*, 285
omissa, *Euethia bicolor*, 552
 Phonipara, 552
 Tiaris, 552
 Tiaris bicolor, 552
onocrotalus occidentalis, *Pelecanus*, 280
Onychoprion fulinginosus, 382
Oporornis philadelphia, 525
ordii, *Falcinellus*, 305
Oreopeleia chrysis, 404
 larva, 405
 montana, 402
 mystacea mystacea, 405
 Oriole, Porto Rican, 535
Oriolus dominicensis, 535
orpheus, *Mimus polyglottos*, 483
 Turdus, 483
Orthorhyncus exilis exilis, 440
Ortiz cubanensis, 331
 cubanensis, 331
 sonnini, 331
 virginianus, 330, 331
 virginianus cubanensis, 331
oryzivora, *Fringilla*, 532
oryzivorus, *Dolichonyx*, 532
 Osprey, 323
 Ostrero, 349
 Ovenbird, 523
 Owl, bare-legged, 430
 Newton's, 433
 Porto Rican short-eared owl, 434
Oxyechus vociferus, 354
 vociferus rubidus, 354
 vociferus vociferus, 353
 Oyster-catcher, 349
Paectlonetta, 310
 erythrorhyncha, 311
 galapagensis, 311
 pagana martinica, *Elainea*, 471
Pagolla wilsonia wilsonia, 352
 Pájaro bobo, 281, 284, 419, 420, 421, 423
 de costa, 420
 del mar, 281
 major, 423

- Pájaro menor, 421
 de agua, 423
 del rey, 452
palliatu8, Haematopus palliatu8, 349
 Palm warbler, 520
palmarum, Dendroica, 520
 Dendroica palmarum, 520
 Motacilla, 520
 Sylvia, 520
 Paloma cabezablanca, 387
 sabanera, 393
 turca, 389
 Palomita, 379
Pandion carolinensis, 324
 haliaëtus, 324
 haliaëtus carolinensis, 323
 Papagaño, 453
 Papagenen, 414
 Papagey, 415
paradisea, Sterna, 380
 Paroquet, Curacao, 417
 Porto Rican, 415
Parra jacana, 349
 violacea, 349
 Parrot, Culebra Island, 414
 Porto Rican, 412
 Parson, 552
 Parson sparrow, 552
Parula americana, 505
passerina, Columba, 398
 Columbigallina, 398, 402
 Fringilla, 560
passerina exigua, Chaemepelia, 402
 trochila, Chaemepelia, 398
Passerina olivacea, 555
passerinus, Ammodramus savannarum, 560
 Coturniculus, 560
passeris, Columba, 398
 Pata amarillo, 366
Patagioenas, 389
 corensis, 389
 leucocephalus, 388
squamosa, 390
 Pato chorizo, 314, 317
 criollo, 309
 cuchareta, 312
 de Florida, 309
 de la Florida, 311
 de la orilla, 309
 del medio, 312, 313
 Dominica, 317
 inglés, 312
 lablanco, 308
 morisco, 312
 pescuezillargo, 309
 pinto, 314
 silvestre, 309, 312, 313
 Pearly-eyed thrasher, 486
 Pecho de oro, 504
 Pectoral sandpiper, 370
pectoralis, Tringa, 370
Pelecanus erythrorhynchos, 281
 fuscus, 280
 leucogaster, 281
 occidentalis occidentalis, 280
 onocrotalus occidentalis, 280
 piscator, 284
 Pelican, 280
 Pelican, brown, 280
pennsylvanicus, Buteo, 323
 Nisus, 322
pensilis, Dendroica, 515
 Matacella, 508, 515
 Sylvia, 515
 Sylvicola, 515
Perdix sonnini, 331
 Perdiz, 402
 del monte, 402
 martiniqueña, 404
peregrinus anatum, Falco, 325
 Periquito, 415
Perissoglossa tigrina, 507
pertinax, Conurus, 417
 Eupsittula pertinax, 417
 Petchary, Porto Rican, 464
petechia, Dendroica, 508
petechia bartholemica, Dendroica, 508
 cruciana, Dendroica, 507
 cruciana, Dendroica, 507
 portoricensis, Dendroica, 508
 ruficapilla, Dendroica, 508
 Peters, J. L., work of, 260, 264, 265
 Petrel, black-capped, 276
petrificatus, Ereunetes, 372
Petrochelidon fulva, 474
 fulva poeciloma, 474
 poeciloma, 474
 Pewee, Porto Rican wood, 469
Phaeopus borealis, 360
 hudsonicus, 360
Phaëthon aethereus, 278, 279
 aethereus og candidus, 278
 americanus, 278
 catesbyi, 277
 flavrostris, 278
 lepturus catesbyi, 277
Phalacrocorax olivaceus mexicanus, 285
 vigua mexicanus, 285
philadelphia, Oporornis, 525
 Sylvia, 525
 phoeniceus, Cassicus, 532
Phoenicopterus ruber, 305
Phonipara bicolor, 552
 omissa, 552
 zena, 552
Phyllomanes calidris, 494
 olivaceus, 497
 Pica-tierra, 525

- Pichon prieto*, 539
pictus elucus, *Aramus* 333
Picus portoricensis, 457
 torquatus, 457
 varius, 459
Pigeon, bare-eyed, 394
 blue, 393
 Jamaican band-tailed, 392
 Porto Rican, 393
 scaled, 389
 white-crowned, 387
Pigeon hawk, 326
Pintado, 332
Pintail, 309
 Bahama, 309
Piping plover, 350
pipiri, *Tyrannus*, 460
Piranga erythromelas, 543
piscator, *Pelecanus*, 284
 Sula, 284
piscator antillarum, *Falco*, 324
Pisobia fuscicollis, 371
 melanotos, 370
 minutilla, 369
 maculata, 370
Pitangus taylori, 464
Pitirre, 460
 de agua, 385
 de mangle, 452
Pitylus portoricensis, 557
Pizpita chica, 520, 522
 de mangle, 520, 522
 dorada, 523
platypterus, *Buteo platypterus*, 322
 Sparvus, 322
Playante, 350, 351, 352, 354, 366, 368, 375
Playero, 351, 352, 354, 362, 368
 mancha, 362
 turco, 357
Plegadis autumnalis, 305
Plegadis falcinellus falcinellus, 304
Plover, American black-bellied, 356
 American golden, 355
 piping, 350
 semipalmated, 351
 upland, 362
 Wilson's, 352
plumbea, *Mimocichla*, 489
plumbeus, *Turdus*, 489
Pluvial, 355, 356
 grande, 356
 sabanero, 354
pluvialis americanus, *Charadrius*, 355
pluvialis dominicus dominicus, 355
podiceps, *Colymbus*, 272
 Podilymbus, 272
podiceps antillarum, *Podilymbus*, 272-275
Podiceps carolinensis, 272
 dominicus, 271
Podilymbus dominicus, 272
 podiceps, 272
 podiceps antillarum, 272-275
 podiceps podiceps, 273-274
poeciloma, *Hirundo*, 474
 Petrochelidon, 474
 Petrochelidon fulva, 474
Poecilonetta bahamensis, 309
 bahamensis bahamensis, 310
Pollo de laguna, 335
 de manglar, 335
Polyborus latibrosus, 325
polyglottos, *Turdus*, 483
polyglottos orpheus, *Mimus*, 483
 portoricensis, *Mimus*, 483
polyglottus, *Mimus*, 483
popetue, *Caprimulgus*, 437
Porphyrio martinica, 342
Porto Rican barn owl, 429
 blackbird, 539
 caracara, 325
 crow, 479
 emerald, 443
 euphonia, 549
 flycatcher, 467
 golden warbler, 507
 grackle, 539
 grasshopper sparrow, 560
 grosbeak, 557
 ground dove, 398
 honey-creeper, 498
 lizard-cuckoo, 423
 oriole, 535
 mango, 449
 paroquet, 415
 parrot, 412
 petchary, 464
 pigeon, 393
 quail-dove, 405
 sharp-shinned hawk, 320
 short-eared owl, 434
 snipe, 360
 sparrow-hawk, 327
 spindalis, 546
 tanager, 544
 thrush, 489
 tody, 453
 whippoorwill, 436
 woodpecker, 457
 wood pewee, 469
portoricensis, *Asio*, 434
 Centurus, 457
 Certhiola, 498, 501
 Certhiola flaveola, 498
 Chamaepelia, 399
 Coereba, 498, 501
 coereba portoricensis, 498
 Columba, 389
 Dendroica petechia, 508

- portoricensis*, *Fringilla zena*, 552
Gallinula chloropus, 343
Icterus, 535
Icterus dominicensis, 535
Loxigilla, 557
Melanerpes, 457
Mimocichla ardosiacea, 489
Mimus polyglottos, 483
Picus, 457
Pitylus, 557
Pyrrhula, 557
Pyrrhulagra, 557
Scotospiza, 557
Spindalis, 546
Tanagra, 546
Todus, 454
Xanthornus, 535
portoricensis sancti-thomae, *Coccyzus*, 501
porto-ricensis, *Scops*, 433
 Porto Rico, description of, 250
Porzana carolina, 337
 flaviventer flaviventer, 339
 flaviventer gossii, 339
 flaviventer hendersoni, 338
 Potts, F. A., work of, 260
 Prairie warbler, 518
Procellaria hesitata, 276
 puffinus, 276
Progne dominicensis, 477
Psittacara maugae, 415
Psittacus dominicensis, 412
 festivus, 412
 rufirostris, 415
 tui, 417
 vittatus, 412
Pterodroma hesitata, 276
ptilorhyncha, *Numida*, 333
Puffinus lherminieri lherminieri, 275
 puffinus, 276
 species, 276
puffinus, *Procellaria*, 276
pumilis, *Corvus*, 482
 Purple gallinule, 342
purpurea, *Hirundo*, 477
pusilla, *Compsothlypis americana*, 504
 Sylvia, 504
 Tringa, 372
pusillus, *Ereunetes*, 372
Pyrauga erythromelas, 543
Pyrrhomitris cucullata, 559
Pyrrhula portoricensis, 557
Pyrrhulagra portoricensis, 557

 Quail, 330
 crested, 331
 Cuban, 331
 Quail-dove, bridled, 405
 Porto Rican, 405
 ruddy, 402
 Quail-dove, Key West, 404
 Querequeté, 437
Querquedula discors, 311
Quiscalus barita, 539
 brachypterus, 539
 crassirostris, 539
quiscula, *Cassicus*, 539

 Rabihorcado, 286
 Rabijunco, 277, 286
 Rail, black, 339
 de Booy's, 340
 sora, 337
 yellow-bellied, 338
Rallus carolinus, 337
 crepitans, 335
 jamaicensis, 339
 longirostris, 335
 longirostris caribaeus, 335
recognita, *Sterna anaetheta*, 381
 Red-billed tropic-bird, 279
 Red-eyed vireo, 497
 Red-footed booby, 284
 Red siskin, 559
 Redstart, 526
regia, *Thalasseus*, 383
 Reina, 498
 Reina mora, 546
 Reinita, 498, 503, 504, 506, 507, 511, 513,
 514, 515, 517, 518, 520, 525, 526
 Reinona, 546
Rhyacophilus solitarius, 365
 Richmond, C. W., work of, 259, 262
ridgwayi, *Icterus icterus*, 538
 Xanthornus icterus, 538
 Riise, work of, 262, 264
 Riise's elaenia, 470
riisii, *Elaenia martinica*, 470
 Elainea, 470
 Elainea martinica, 471
 Ring-necked duck, 313
riparia, *Clivicola*, 473
 Cotyle, 473
 Hirundo, 472
Riparia riparia riparia, 472
 Rola, 398
 Rolita, 398
 Roseate tern, 379
rostratus, *Tyrannus*, 460
rothschildi, *Fregata magnificens*, 286
 Royal tern, 383
ruber, *Phoenicopterus*, 305
rubida, *Eristomata*, 314
 Eristomata jamaicensis, 317
rubidus, *Oxyechus vociferus*, 354
 Ruby-throated hummingbird, 443
 Ruddy Quail-dove, 402
 turnstone, 357
ruficapilla, *Dendroica*, 508

- ruficapilla*, *Dendroica petechia*, 508
rufigollis, *Ardea tricolor*, 293
 Demigretta, 292
 Egretta, 292
 Hydranassa tricolor, 292
ruftnucha, *Aegialitis wilsonia*, 352
 Eupoda wilsonia, 352
ruftnuchus, *Ochthodromus wilsonius*, 352
ruftrostris, *Psittacus*, 415
 Ruiseñor, 483
 Ruiseñor pequeño, 470
rustica erythrogaster, *Hirundo*, 473
ruticilla, *Motacilla*, 526
 Muscicapa, 526
 Setophaga, 526
Rynchops nigra nigra, 387
- Saba Island, description of, 252
 Sail Rock, description of, 252
sancti-thomae, *Certhiola*, 501
 Coereba portoricensis, 501
 Sanderling, 374
 Sandpiper, least, 369
 pectoral, 370
 semipalmated, 372
 solitary, 364
 spotted, 362
 stilt, 371
 western, 373
 white-rumped, 371
sandvicensis acufavida, *Sterna*, 384
 acufavidus, *Thalasseus*, 384
 San Pedro, 453
 Santo Domingan grasshopper sparrow, 560
Saurothera, 423
 vieilloti, 423
savannarum, *Ammodramus*, 560
 Coturniculus, 560
 Coturniculus savannarum, 560
savannarum borinquensis, *Ammodramus*, 560
 intricatus, *Coturniculus*, 560
 passerinus, *Ammodramus*, 560
 Scaled pigeon, 389
 Scarlet-cheeked weaver-finch, 530
 Scarlet tanager, 543
 Schmidt, Karl P., work of, 261
sclateri, *Euphonia*, 549
 Tanagra, 549
scolopacea, *Limosa*, 371
scolopaceus, *Hians*, 334
 Limnodromus griseus, 371
 Macrorhamphus, 371
Scolopax alba, 305
 borealis, 360
 delicata, 358
 fedoa, 374
 flavipes, 366
 gallinago, 358
 Scolopax melanoleuca, 368
 semipalmata, 366
 wilsoni, 358
Scops porto-ricensis, 433
Scotospiza portoricensis, 557
scutatus, *Spermestes cucullatus*, 530
Seiurus aurocapillus aurocapillus, 523
 motacilla, 522
 naevius notabilis, 522
 noveboracensis notabilis, 522
 noveboracensis noveboracensis, 520
semipalmata, *Aegialitis*, 351
 Scolopax, 366
 Symphemia, 366
semipalmata major, *Symphemia*, 366
 Semipalmated plover, 351
 sandpiper, 372
semipalmatus, *Aegialeus*, 351
 Catoptrophorus semipalmatus, 366
 Charadrius, 351
semipalmatus longicaudis, *Catoptrophorus*, 366
seniculus, *Coccytes*, 421
 Coccyzus, 421
 sericeus, *Molothrus*, 543
Sericotes holosericeus holosericeus, 445
Setochalcis noctithera, 436
Setophaga ruticilla, 526
 Shearwater, Audubon's, 275
 Manx, 276
 Short-eared owl, Porto Rican, 434
 Shoveller, 312
 Sinsonte, 483
 Siskin, red, 559
Sitta curvirostris, 463
Siurus aurocapillus, 524
 Skimmer, black, 387
 Snipe, Porto Rican, 360
 Wilson's, 358
 Snowy egret, 291
 heron, 291
solitaria, *Tringa solitaria*, 364
 Solitario, 364, 482
 Solitary sandpiper, 364
solitarius, *Helodromas solitarius*, 365
solitarius, *Rhyacophilus*, 365
 Totanus, 364
sonnini, *Eupsychortyx sonnini*, 331
 Perdix, 331
sonnini, *Ortyx*, 331
 Sooty tern, 381
 Sora, 337
 Southwest Cay, see Louis Peña Island
 Sparrow-hawk, Porto Rican, 327
 Sparrow, Lincoln's, 562
 parson, 552
 Porto Rican grasshopper, 560
sparveria, *Cerchneis*, 328
sparveria loquacula, *Cerchneis*, 328

- sparverius*, *Falco*, 328
 Tinnunculus, 327
sparverius caribaeorum, *Falco*, 327
 loquacula, *Falco*, 328
Sparcius platypterus, 322
Spatula clypeata, 312
 maculata, 312
speculiferus, *Chlorospingus*, 544
 Nesospingus, 544
Spermestes cucullata, 528
 cucullatus cucullatus, 528
 cucullatus scutatus, 530
Spermophila bicolor, 552
Sphyrapius varius varius, 459
Spindalis, Porto Rican, 546
Spindalis portoricensis, 546
spinicauda, *Dafla*, 311
spinosa, *Anas*, 317
 Jacana, 349
spinosa violacea, *Jacana*, 349
Spinus cucullatus, 559
Spoonbill, 312
Sporadinus maugei, 443
Sporaeginthus melpoda, 530
Spotted sandpiper, 362
squamosa, *Columba*, 389
 Patagioenas, 390
squatarola, *Charadrius*, 356
squatarola cynosurae, *Squatarola*, 356
Squatarola helvetica, 356
 squatarola, 357
 squatarola cynosurae, 356
Stahl, Augustin, work of, 258
Stejneger, L., work of, 259, 262
Sterna aculeifida, 384
 albifrons antillarum, 382
 anaetheta melanoptera, 380
 anaetheta recognita, 381
 anaethetus, 380
 antillarum, 383
 aranea, 379
 cayana, 383
 dougallii dougallii, 379
 fuliginosa, 382
 fuscata, 382
 fuscata fuscata, 381
 hirundo hirundo, 379
 maxima, 383
 melanoptera, 380
 paradisea, 380
 sandvicensis aculeifida, 384
 stolida, 385
 surinamensis, 385
Sternula antillarum, 382
Stilt, Black-necked, 375
Stilt sandpiper, 371
stolida, *Sterna*, 385
stolidus, *Anous stolidus*, 385
stolidus antillarum, *Myiarchus*, 467, 468
Streator, Clark P., work of, 258
Strepsilas interpres, 357
Streptocoryle alcyon alcyon, 452
striata, *Dendroica*, 517
 Muscicapa, 517
striatus venator, *Accipiter*, 320
Strix brachyotus, 434
 ferruginea, 430
 nudipes, 430
Struthers, Parke H., work of, 260, 261
St. Croix, description of, 251
St. Croix honey-creeper, 502
St. ti Thomae, *Certhiola*, 501
St. John, description of, 252
St. Thomas, description of, 252
Sugar-bird, 501, 502
Sula coryi, 284
 fusca, 281
 leucogastra, 282
 leucogastra leucogastra, 281
 piscator, 284
 sula, 281, 284
sula, *Dysporus*, 281
Sundevall, work of, 257
surinamensis, *Chlidonias nigra*, 385
 Hydrochelidon nigra, 385
 Sterna, 385
Swallow, bank, 472
 barn, 473
 Jamaican cliff, 474
 tree, 472
Swift, Antillean black, 439
Swift, Robert, work of, 257
Sylvia discolor, 518
 magnolia, 511
 palmarum, 520
 pensilis, 515
 philadelphia, 525
 pusilla, 504
 trichas, 525
Sylvicola altiloqua, 494
 americana, 504
 coronata, 513
 discolor, 518
 pensilis, 515
Symphemia semipalmata, 366
 semipalmata major, 366
Taarn-falken, 327
Tachycineta bicolor, 472
Tachypetes aquilus, 286
Tanager, Porto Rican, 544
 scarlet, 543
Tanagra dominica, 547
 portoricensis, 546
 sclateri, 549
Tantalus falcinellus, 304
Taylor, E. C., work of, 256, 257, 264
taylori, *Pitangus*, 464

- taylori*, *Tolmarchus*, 464
Tolmarchus caudifasciatus, 465, 466
Tyrannus, 464
 Teal, blue-winged, 311
teres, *Coccyzus minor*, 421
 Tern, black, 385
 bridled, 380
 Cabot's, 384
 common, 379
 gull-billed, 379
 least, 382
 roseate, 379
 royal, 383
 sooty, 381
Tetrao virginianus, 330
Thalasseus, 383
Thalasseus acutiflavus, 384
 maximus maximus, 383
 regia, 383
 sandvicensis acutiflavus, 384
thomensis, *Colymbus*, 271
 Thrasher, pearly-eyed, 486
 Thrush, 486
 Porto Rican, 489
 wood, 491
Thula, *Ardea*, 291
 Egretta thula, 291
Tiaris bicolor omissa, 552
 olivacea, 555
 olivacea bryanti, 555
 omissa, 552
tigrina, *Dendroica*, 506
 Motacilla, 506
 Perissoglossa, 507
 Tigra, 271
 Tijerilla, 286
Tinnunculus caribaeum, 328
 dominicensis, 328
 sparverius, 327
 Todd, W. E. C., work of, 259
Todus hypochondriacus, 454
 mexicanus, 453
 portoricensis, 454
 viridis, 454
 Tody, Porto Rican, 453
Tolmarchus caudifasciatus taylori, 465, 466
 taylori, 464
 Tomato, 546
 Torcaza, 387
torquatus, *Picus*, 457
 Tortola, description of, 252
 Tortola Sanjuanera, 394
 Tortolita, 398
Totanus flavipes, 366
 melanoleucus, 368
 solitarius, 364
 Tree-duck, black-bellied, 307
 West Indian, 307
 Tree swallow, 472
 Trepadora, 503
Trichas brachidactylus, 525
trichas brachidactyla, *Geothlypis*, 525
 Geothlypis, 525
 Sylvia, 525
tricolor ruficollis, *Ardea*, 293
 Hydranassa, 292
Tringa fuscicollis, 371
 himantopus, 371
 longicauda, 362
 macularia, 362
 maculata, 370
 melanotos, 370
 minutilla, 369, 372
 morinella, 357
 pe toralis, 370
 pusilla, 372
 solitaria solitaria, 364
Tringoides macularius, 362
trochila, *Chaemepelia passerina*, 398
Trochilus aurulentus, 449
 colubris, 443
 exilis, 440, 442
 holosericeus, 445
 margaritaceus, 449
 maugaeus, 443
 melanogaster, 449
 viridis, 447
 viridis aurulentus, 449
tropicalis, *Buteo*, 332
 Tropic-bird, red-billed, 279
 yellow-billed, 277
 Troupial, 538
 Truche, 486
Trynna alba, 374
tschadensis, *Estrilda melpoda*, 532
tui, *Psittacus*, 417
Turdus ardosiaeca, 489
 auro-capillus, 523
 fuscatus, 486
 gilvus, 485
 motacilla, 522
 mustelinus, 491
 orpheus, 483
 plumbeus, 489
 polyglottos, 483
 Turkey vulture, 318
 Turnstone, ruddy, 357
Tyrannula martinica, 470
Tyrannus antillarum, 467
 curvirostris, 463
 dominicensis dominicensis, 460
 griseus, 460
 pipiri, 460
 rostratus, 460
 taylori, 464
 tyrannus, 464
tyrannus, *Lanius*, 464
 Muscicapa, 460

- Tyto carattica*, 429
tzitzihoa, *Anas*, 309
 Dafila acuta, 309
- umbria*, *Motacilla*, 513
 Upland Plover, 362
usneae, *Compsothlypis americana*, 505
- venator*, *Accipiter striatus*, 320
 Vencejo, 439
varia, *Mniotilta*, 503
 Motacilla, 503
varius, *Picus*, 459
 Sphyrapicus varius, 459
 Verdadon, 453
 de especulo, 544
 Verdoso, 544
Vetola fedea, 374
vetula, *Cuculus*, 423
vicinus, *Chordeiles minor*, 438
 Vidal, Rafael, work of, 261
vicilloti, *Saurothera*, 423
 Viequera, 387
 Vieques Island, description of, 251
vigua mexicanus, *Phalarocorax*, 285
violacea, *Ardea*, 300
 Jacana spinosa, 349
 Nyctanassa, 301
 Nyctanassa violacea, 300
 Parra, 349
violacea cayennensis, *Nyctanassa*, 301
 jamaicensis, *Nyctanassa*, 301
violaceus, *Nyctherodias*, 300
 Nyctiorax, 300
virens, *Dendroica virens*, 514
 Motacilla, 514
Vireo altiloquus, 494
 calidris, 494
 latimeri, 492
 olivaceus, 497
 olivaceus olivaceus, 494
 virescens, 497
Vireo, Jamaican, 494
 red-eyed, 497
Vireosylva altiloqua, 494
 calidris calidris, 494
 olivacea, 497
virescens, *Ardea*, 295, 296
 Butorides, 296
 Butorides virescens, 295
 Oeniscus, 296
 Vireo, 497
virescens cubanus, *Butorides*, 296
 maculatus, *Butorides*, 296
virginialis, *Lampornis*, 449
 Virgin Gorda, description of, 252
virginianus, *Chordeiles*, 437, 438
 Colinus virginianus, 330
 Ortyx, 330, 331
 virginianus, *Tetrao*, 330
virginianus cubanensis, *Colinus*, 331
 Ortyx, 331
virginianus minor, *Chordeiles*, 437
virginicus, *Charadrius*, 356
 Virgin Island Honey-creeper, 501
viridis, *Anthracothonax*, 447
 Ardea, 296
 Lampornis, 447, 450
 Todus, 454
 Trochilus, 447
viridis aurentus, *Trochilus*, 449
vittata, *Amazona*, 414
 Amazona vittata, 412
 Chrysotis, 412
vittata gracillipes, *Amazona*, 414
vittatus, *Psittacus*, 412
 Viuda, 375
rocifera, *Hiaticula*, 354
rociferus, *Aegialitis*, 353, 354
 Antrostomus, 436
 Antrostomus rociferus, 436
 Charadrius, 353, 354
 Oryzochus, 354
 Oryzochus rociferus, 353
rociferus rubidus, *Oryzochus*, 354
rulgaris, *Icterus*, 538
Vultur aura, 318
- ragleri*, *Icterus*, 535
 Warbler, Adelaide's, 515
 black and white, 503
 black-poll, 517
 black-throated blue, 511
 black-throated green, 511, 514
 Cape May, 506
 magnolia, 511
 mourning, 525
 myrtle, 513
 northern parula, 504
 palm, 520
 Porto Rican golden, 507
 yellow-throated, 514
 Water Island, description of, 252
 Water-thrush, 520
 Grinnell's, 522
 Louisiana, 522
 Weaver-finch, hooded, 528
 scarlet-cheeked, 530
 Western sandpiper, 373
 West, Hans, work of, 262, 263
 West Indian great blue heron, 288
 green heron, 296
 jacana, 349
 killdeer, 354
 red-tailed hawk, 320
 ruddy duck, 314
 tree-duck, 307
 Wetmore, A., work of, 253, 256, 259, 261, 262

- Whippoorwill, Porto Rican, 436
 White-crowned pigeon, 387
 White-head, 387
 White ibis, 305
 White-rumped sandpiper, 371
 Wigeon, American, 308
 Wild canary, 507
 Willet, 366
wilsoni, *Actodromas*, 369
 Hiaticula, 352
 Scolopax, 358
wilsonia, *Charadrius*, 352
 Pagolla wilsonia, 352
wilsonia rufinucha, *Aegialitis*, 352
 Eupoda, 352
wilsonii, *Gallinago*, 358
wilsonius, *Aegialitis*, 352
 Ochthodromus, 352
wilsonius rufinuchus, *Ochthodromus*, 352
 Wilson's plover, 352
 snipe, 358
 Winch, Cyrus S., work of, 263, 264, 265
 Woodpecker, yellow-bellied, 459
 Porto Rican, 457
 Wood pewee, Porto Rican, 469
 Wood thrush, 491
 Worthington, W. W., work of, 259

xantholaemus, *Conurus*, 417, 418
xanthomus, *Agelaius*, 532
 Icterus, 532
Xanthornus icterus ridgwayi, 538
 portoricensis, 535

 Yaboa, 299, 300, 302
 Yaboa real, 299, 300
 Yagareta, 343, 346
 Yaguasa, 288, 307
 Yegüita, 375
 Yellow-bellied rail, 338
 woodpecker, 459
 Yellow-billed cuckoo, 420

 Yellow-billed tropic-bird, 277
 Yellow-crowned night heron, 300
 Yellow-legs, greater, 368
 Yellow-legs, lesser, 366
 Yellowneck, 507
 Yellow-shouldered blackbird, 532
 Yellowthroat, Maryland, 525
 northern, 525
 Yellow-throated warbler, 514

 Zancudo, 375
 Zaramago, 272
 Zaramagullón, 271, 272
 Zarapico blanquinegro, 368
 gracioso, 372
 manchado, 362, 370
 menudo, 369
 mosqueado, 362
 pequeño, 369
 solitario, 364
 zancudo, 371
zena, *Phonipara*, 552
zena portoricensis, *Fringilla*, 552
Zenaida amabilis, 394
 aurita, 398
 castanea, 398
 martinicana, 398, 404
 zenaida lucida, 395
 zenaida zenaida, 394
 Zenaida dove, 394
Zenaidura macroura macroura, 395
 Zorzál, 486, 489
 azul, 489
 de los palmares, 486
 de patas coloradas, 489
 negro, 486
 pardo, 486
 Zumbador, 440, 443, 445, 447, 449
 dorado, 449
 verde, 447
 Zumbadorcito, 443
 Zumzum, 443, 449

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