

REVISION OF THE PENARD OÖLOGICAL COLLECTION FROM SURINAM

by

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In 1910 the Rijksmuseum van Natuurlijke Historie at Leiden obtained the important egg collection from Surinam, brought together by Messrs. F. P. and A. P. Penard. Owing to different circumstances this collection as a whole was not studied again, and, with the exception of some notes in papers by Schönwetter (1932, 1933) nothing has been published upon the material since it came into the Museum. In 1941 and 1942 I had the opportunity to rearrange the oölogical collections of the Leiden Museum, and during this work the Penard material was incorporated into the general collection. During my study of the material I became convinced that it is worth while to publish more detailed data than those contained in the works of the Penard's. This especially holds as the measurements given by the cited authors as a rule are too large.

In the collection there are a large number of eggs not collected in Surinam, but in the U. S. A. (e. g., 14/2 and 2/1 of *Cathartes aura* (L.)), or in Brazil, etc. As a rule these eggs from outside Surinam are not dealt with in the present paper.

As far as concerns the nomenclature adopted in the present paper, the first name is that of the Check-List by Peters (1931-1940) or of the Catalogue by Cory and Hellmayr (1918-1938), the latter was used for those families which have not yet appeared in the former work. Next to this name in brackets the name is given as used by the Penard's.

The material from Surinam is listed under each species as, e.g., 3/3, 7/2, etc., which means that the collection contains 3 sets of 3 eggs and 7 sets of 2.

As far as concerns the colour, in some cases I made use of Ridgway's Color Standards and Nomenclature (1912).

When the material was not too extensive the whole of it was measured, when very abundant material of one species was present as a rule the

measurements have been taken from 50 eggs. All measurements are given in mm.

The weight of the eggs is given in grams or milligrams, as exact as possible as far as concerns the smaller eggs. The weight of the larger eggs are approximately correct only.

There are some interesting questions concerning the oölogy of the birds dealt with here, e. g., those of *Tapera naevia* (L.) and *Psomocolax oryzivorus* (Gm.). As far as our present time knowledge goes we cannot decide whether the Penard's were right or not in their presumptions concerning the eggs of these birds. Perhaps in future data in American collections may throw light on these interesting questions.

In the near future I intend to give some more details on imperfectly known eggs, based on material of the collection of the Penard's.

My best thanks are due to Dr. G. C. A. Junge, curator of the Museum, who has given me all the assistance I needed during my work, and to Mr. M. Schönwetter, who repeatedly sent me his opinion on doubtful questions.

ANATIDAE

Cairina moschata (L.) (Peters, 1931, p. 155) (*Cairina moschata* L., Penard & Penard, 1908, p. 84).

Material: 1/4, 1/2. Shape and texture: nearly glossless. Ground: warm creamish, stained; greenish. Measurements in mm: average 64 × 44; minimum 61.1 × 43.6, 62.8 × 42.7; maximum 67.5 × 45. Average weight: 6.2 g. Breeding time: March-April.

Anas bahamensis bahamensis L. (Peters, 1931, p. 167) (*Dafila bahamensis* L., Penard & Penard, 1908, p. 95).

Material: 2/9, 1/8, 1/7, 4/5, 2/3, 1/2, 1/1. Shape and texture: smooth. Ground: warm creamish, rarely somewhat greenish. Measurements in mm: average (62 eggs) 50.3 × 35.2; minimum 47.3 × 34.6, 48.8 × 32.1; maximum 54.2 × 35.3, 50.8 × 37.8. Average weight: 2.6 g. Breeding time: May-July.

Dendrocygna autumnalis discolor Scl. & Salv. (Peters, 1931, p. 153) (*Dendrocygna discolor* Scl. & Salv., Penard & Penard, 1908, p. 99).

Material: 1/15, 1/12, 1/11, 1/8. Shape and texture: partly highly glossy and partly nearly glossless. Ground: whitish; creamish and stained. Measurements in mm: average (46 eggs) 51.1 × 37.3; minimum 46.2 × 36.9, 47.8 × 35; maximum 55.1 × 36.6, 54 × 38.8. Average weight: 4.34 g. Breeding time: July-August.

Notes. 1/15 creamish and stained, glossless; 1/12 light creamish, glossless; 1/11 white and glossy; 1/8 white and glossy.

Identification certain?

Dendrocygna viduata (L.) (Peters, 1931, p. 153) (*Dendrocygna viduata* L., Penard & Penard, 1908, p. 102).

Material: 1/1 (Surinam), 1/2 (Madagascar). Shape and texture: smooth, moderately glossy. Ground: creamish. Measurements in mm: 51 × 39.2 (Surinam); 50.2 × 39, 48.6 × 38.4 (Madagascar). Breeding time: July in Surinam; September in Madagascar.

IBIDIDAE

Guara rubra (L.) (Peters, 1931, p. 137) (*Eudocimus ruber* L., Penard & Penard, 1908, p. 129).

Material: 1/5, 3/4, 1/3, 23/2, 556/1. Shape and texture: elongated, glossless. Ground: greenish, dirty bluish white, fine greenish blue. Spots: boldly and handsomely blotched, rather dark, but also light brown, especially at large end. Varieties: capped; zoned; nearly unmarked. Measurements in mm: average (100 eggs) 56.03 × 37.06; minimum: 48.5 × 34.6, 55.9 × 33.4; maximum 65.3 × 35.5, 50.2 × 42.9. Average weight (100 eggs): 3.14 g. Breeding time: most of the clutches were collected in May, the single eggs in July.

Notes. In the collection there are some dwarf eggs, e.g., 2 clutches of two eggs. The smallest measures 31.2 × 27.1 mm.

CICONIIDAE

Mycteria americana L. (Peters, 1931, p. 126) (*Mycteria americana* L., Penard & Penard, 1908, p. 142).

Material: 2/1. Shape and texture: pointedly elongated, rough and glossless, many deep pores. Ground: yellowish white (stained). Measurements in mm: 86.2 × 57.4 and 91.8 × 56.4. Weight: 15½ and 12 g. Breeding time: May-June.

ARDEIDAE

Ardea cocoi L. (Peters, 1931, p. 101) (*Ardea cocoi* L., Penard & Penard, 1908, p. 154).

Material: 1/1. Shape and texture: as all herons. Ground: as all herons. Measurements in mm: 63 × 43.3. Weight: 3.2 g. Breeding time: July.

Florida coerulea (L.) and **Hydranassa tricolor** (P. L. S. Müller).

In the collection there are a great many eggs of these species. Possibly from the former 1/4 and 189/1, and from the latter 1/3, 2/2 and 231/1, but

these eggs are not distinctly separated in the collection and they resemble each other very closely. According to Penard & Penard the eggs of *Hydranassa tricolor* are somewhat smaller (43×32 mm, l.c., p. 160) than those of *Florida coerulea* (41×31 mm, l.c., p. 165). I have omitted them here.

Leucophoyx thula thula (Molina) (Peters, 1931, p. 113) (*Leucophoyx candidissima* Gm., Penard & Penard, 1908, p. 160).

Material: $4/4$, $3/3$, $3/2$, $99/1$. Shape and texture: as all herons. Ground: as all herons. Measurements in mm: average (50 eggs) 42.9×32.4 ; minimum 40.1×30.4 , 40.2×30.1 ; maximum 49.4×32.3 ; 42×34.7 . Average weight: 1.44 g. Breeding time: May-June, one clutch in August.

Nyctanassa violacea cayennensis (Gm.) (Peters, 1931, p. 117) (*Nyctanassa violacea* L., Penard & Penard, 1908, p. 166).

Material: $5/3$, $11/2$, $7/1$. Shape and texture: as all herons. Measurements in mm: average: (40 eggs) 50.5×35.3 ; minimum 44.4×36 , 54.3×33.1 ; maximum 55.6×35.3 , 53.7×37 . Average weight: 2.225 g. Breeding time: May-August.

Nycticorax nycticorax hoactli (Gm.) (Peters, 1931, p. 114) (*Nycticorax naevius* Bodd., Penard & Penard, 1908, p. 167).

Material: $3/4$, $7/3$, $5/2$, $1/1$ (and $5/4$, $1/3$ and $1/2$ from U. S. A.). Shape and texture: as all herons. Measurements in mm: average (40 eggs) 51.2×37.4 ; minimum 47.4×37 , 52.4×36 ; maximum 58.1×37.7 , 51.5×38.6 . Average weight: 2.29 g. Breeding time: May, two clutches in August.

Cochlearius cochlearius cochlearius (L.) (Peters, 1931, p. 125) (*Cancroma cochlearia* L., Penard & Penard, 1908, p. 170).

Material: 574 eggs (not separated in clutches). Shape and texture: as all herons. Ground: dirty white, but, according to Penard & Penard, bluish when fresh. Spots: very slightly spotted at the large end, often nearly invisible. According to Penard & Penard more distinctly spotted when fresh. Measurements in mm: average (50 eggs) 50.25×35.25 ; minimum 44.9×33.9 , 49.1×33.2 ; maximum 57.1×36.6 , 49.4×38.9 . Average weight: 2.18 g. Breeding time: June-July.

Butorides striatus striatus (L.) (Peters, 1931, p. 104) (*Butorides striata* L., Penard & Penard, 1908, p. 177).

Material: $1/5$, $2/4$, $39/3$, $26/2$, $16/1$. Shape and texture: as all herons. Measurements in mm: average (50 eggs) 37.6×27.8 ; minimum 32.3×26.8 , 37.2×23.8 ; maximum 41.1×26.7 , 36.3×30.1 . Average weight: 0.210 g. Breeding time: April-August, one in March, two in September.

Notes. One dwarf egg measures 25.4×20.9 mm.

EURYPYGIDAE

Eurypyga helias helias (Pallas) (Peters, 1934, p. 216) (*Eurypyga helias* Ill., Penard & Penard, 1908, p. 192).

Material: 1/1. Shape and texture: shortly elliptical, slightly glossy. Ground: light pinkish cinnamon (Ridgway). Spots: handsomely and boldly blotched reddish brown (mars brown, Ridgway). Purplish under markings. Measurements in mm: 42.8×34.2 . Weight: 1.38 g. Breeding time: May.

RALLIDAE

Aramides cajanea cajanea (P. L. S. Müller) (Peters, 1934, p. 175) (*Aramides cajanea* P. L. S. Müll., Penard & Penard, 1908, p. 202).

Material: 2/5, 3/4, 2/3, 1/1. Shape and texture: slightly glossy. Ground: light creamish. Spots: sparingly spotted reddish brown and with purplish under markings, chiefly at large end (as most Rallidae). Varieties: a single egg nearly unmarked, on some eggs the spots are somewhat larger. Measurements in mm: average (30 eggs) 48.3×33.9 ; minimum: 44.1×33.4 , 46.2×31.4 ; maximum 52.2×34.5 , 49.4×35.6 . Average weight: 1.98 g. Breeding time: April-June, one in the end of March.

Porzana albicollis typhoea Peters (Peters, 1934, p. 185) (*Porzana albicollis* V., Penard & Penard, 1908, p. 206).

Material: 2/5, 4/4, 7/3, 12/2, 8/1. Shape and texture: partly spherical, partly broadly elliptical; smooth, moderately glossy. Ground: whitish, light creamish. Spots: rather sparingly marked light and dark brown, especially at large end, purplish under markings. Generally the spots are small. Varieties: two sets have a warm creamish ground, one set is white unmarked. Measurements in mm: average (50 eggs) 33.17×25.62 ; minimum 29.1×23.2 , 29.3×22.7 ; maximum 36.2×27.6 . Average weight: 0.530 g. Breeding time: January-July.

Notes. Of a set of two dwarf eggs (30.6×25.1 and 31.7×25.9) one egg has a quite abnormal shell: ground yellowish white, unmarked, but with yellowish brown deep pores.

Laterallus viridis viridis (P. L. S. Müller) (Peters, 1934, p. 192) (*Creiscus cayennensis* Bodd., Penard & Penard, 1908, p. 210).

Material: 3/3, 27/2, 26/1. Shape and texture: smooth, moderately glossy. Ground: white. Spots: unspotted, Varieties: one egg has a rough texture.

Measurements in mm: average (50 eggs) 32.96×24.07 ; minimum 31×22.4 , 35.5×23 ; maximum 36.9×24.5 , 34.1×25.5 . Average weight: 0.573 g. Breeding time: January-July.

Porphyryla martinica (L.) (Peters, 1934, p. 206) (*Porphyriola martinica* L., Penard & Penard, 1908, p. 212).

Material: 2/8, 4/7, 2/6, 2/5, 5/4, 3/5, 3/2, 4/1. Shape and texture: moderately glossy. Ground: creamish. Spots: reddish and dark brown. Varieties: one clutch warm pinkish cream, another light pinkish cream, nearly unmarked. Measurements in mm: average (50 eggs) 40.25×28.58 ; minimum 36.6×27.5 , 40.2×25.4 ; maximum 48.5×30 , 38.8×30 . Average weight: 2.42 g. Breeding time: March-July, one egg in January.

ARAMIDAE

Aramus scolopaceus scolopaceus (Gm.) (Peters, 1934, p. 155) (*Aramus scolopaceus* Gm., Penard & Penard, 1908, p. 218).

Material: 1/6. Shape and texture: rather spherical, nearly glossless. Ground: light buff (Ridgway), some eggs with a very slight greenish tinge. Spots: yellowish brown, sayal brown (Ridgway), especially at the large end and purplish under markings. Average measurements in mm: 56.1×44.2 . Average weight: 5.42 g. Breeding time: July.

Notes. One egg from Argentina (*A. sc. carau* Vieillot) measures 57.3×44.3 ; one egg from S. Brazil (*A. sc. carau* Vieillot) measures 60.4×43 . The latter is much greener and more distinctly marked.

JACANIDAE

Jacana spinosa jacana (L.) (Peters, 1934, p. 229) (*Jacana jacana* L., Penard & Penard, 1908, p. 229).

Material: 70/4, 67/3, 34/2, 113/1. Shape and texture: most eggs are highly glossy. Ground: tawny olive, pinkish buff (Ridgway). Spots: network of blackish lines. Varieties: of 2 or 3 eggs the ground is very light, nearly white. One egg is capped on light ground. Measurements in mm: average (50 eggs) 30.9×22.8 ; minimum 26.2×22.2 , 30.4×21.2 (one dwarf egg 23.7×19.2); maximum 33.5×23.6 , 31.6×24.6 . Average weight: 0.490 g. Breeding time: March-August, one in January, three in September.

CRACIDAE

Crax nigra L. (Peters, 1934, p. 10) (*Crax alector* L., Penard & Penard, 1908, p. 295).

Material: 1/3. Shape and texture: very rough, elliptical. Ground: white, stained. Average measurements in mm: 83.3×60.5 . Average weight: 20 g. Breeding time: January.

ODONTOPHORIDAE

Odontophorus gujanensis gujanensis Gm. (Peters, 1934, p. 52) (*Odontophorus guianensis* Gm., Penard & Penard, 1908, p. 311).

Material 1/4. Shape and texture: elliptical. Ground: white, moderately glossy. Average measurements in mm: 38.4×28.4 . Average weight: 1.27 g. Breeding time: March.

TINAMIDAE

Tinamus major major (Gm.) (Peters, 1931, p. 13) (*Tinamus subcristatus* Cab., Penard & Penard, 1908, p. 317).

Material: 1/8, 2/7, 4/6, 2/5, 4/4, 3/3, 1/2, 8/1. Shape and texture: broadly elliptical, roundish, highly glossy (polished). Ground: lumière blue (Ridgway). Measurements in mm: average (50 eggs) 56×44.9 ; minimum 47.1×38.5 ; maximum 60×47.5 , 58.8×47.9 . Average weight: 3.78 g. Breeding time: January-May, one in September.

Crypturellus soui soui (Hermann) (Peters, 1931, p. 18) (*Crypturellus pileatus* Bodd., Penard & Penard, 1908, p. 320).

Material: 5/2, 5/1. Shape and texture: elliptical, glossy. Ground: avellaneus (Ridgway). Measurements in mm: average (15 eggs) 40.2×30.9 ; minimum 38×31.5 , 40.5×29.7 ; maximum 42.6×31.6 , 42.2×32.4 . Average weight: 1.47 g. Breeding time: April-July, December-January.

Notes. Ground colour seems to have changed after preparation.

Crypturellus variegatus variegatus (Gm.) (Peters, 1931, p. 20) (*Crypturellus variegatus* Gm., Penard & Penard, 1908, p. 321).

Material: 3/2, 5/1. Shape and texture: elongately elliptical. Ground: light buff to light ochraceous salmon. Measurements in mm: average (9 eggs) 54.2×36.6 ; minimum 50.4×35.8 , 53×34.7 ; maximum 59×37 , 52.5×38.1 . Average weight: 1.47 g. Breeding time: January-June.

COLUMBAE

Columba rufina rufina Temminck (Peters, 1937, p. 66) (*Columba rufina* Temm., Penard & Penard, 1908, p. 330).

Material: 4/2, 4/1. Shape and texture: as all pigeons. Ground: white. Measurements in mm: average (12 eggs) 36.15×26 ; minimum 33.1×24.2 ; maximum 39.8×26.3 , 36.1×26.9 . Average weight: 822 mg. Breeding time: February-March, September-October.

Zenaidura auriculata rubripes (Lawrence) (Peters, 1937, p. 85) (*Zenaidura vinaceo-rufa* Ridgw., Penard & Penard, 1908, p. 335).

Material: 1/1. Shape and texture: as all pigeons. Ground: white. Measurements in mm: 29.1×24.6 . Weight: 360 mg. Breeding time: August.

Columbigallina passerina griseola (Spix) (Peters, 1937, p. 107) (*Chamaepelia passerina* L., Penard & Penard, 1908, p. 337).

Material: 2/3, 129/2. Shape and texture: as all pigeons. Ground: white. Measurements in mm: average (50 eggs) 21.8 × 16.44; minimum 19.3 × 15.2; maximum 23.4 × 17, 22.3 × 18. Average weight (60 eggs): 167 mg. Breeding time: January-February, July-November.

Columbigallina talpacoti talpacoti (Temminck) (Peters, 1937, p. 108) (*Chamaepelia rufipennis* G. R. Gr., Penard & Penard, 1908, p. 340).

Material: 3/3, 91/2. Shape and texture: as all pigeons. Ground: white. Measurements in mm: average (50 eggs) 23 × 17.1; minimum 21.4 × 17, 23 × 15.5; maximum 25.3 × 16.1, 24.1 × 18.2. Average weight: 197 mg. Breeding time: nearly the whole year.

Claravis pretiosa (Ferrari-Perez) (Peters, 1937, p. 110) (*Peristera cinerea* Temm., Penard & Penard, 1908, p. 342).

Material: 1/2. Shape and texture: the two eggs are very elongated. Ground: white. Measurements in mm: 25.5 × 16.8, 24.4 × 15.9. Average weight: 190 mg. Breeding time: May.

Leptotila verreauxi brasiliensis (Bp.) (Peters, 1937, p. 123) (*Leptotila verreauxi* Bp., Penard & Penard, 1908, p. 343).

Material 1/2 (Surinam), 1/2 (Venezuela). Shape and texture: as all pigeons. Ground: the eggs from Surinam are creamish (stained?), those from Venezuela white. Measurements in mm: 26.7 × 19.2, 26.8 × 19.3 (Surinam), 28.8 × 21.6, 28.1 × 20.7 (Venezuela). Average weight: 379 mg. Breeding time (Surinam): January, (Venezuela): July.

Leptotila rufaxilla rufaxilla (Richard and Bernard) (Peters, 1937, p. 127) (*Leptotila rufaxilla* Rich. & Bern., Penard & Penard, 1908, p. 344).

Material: 1/3, 20/2, 30/1. Shape and texture: as all pigeons. Ground: white. Measurements in mm: average (28 eggs) 27.7 × 21.1; minimum 24.5 × 19.6; maximum 31 × 21.5, 27.6 × 22.4. Average weight: 412 mg. Breeding time: all months, except November and October.

Oreopeleia montana (L.) (Peters, 1937, p. 130) (*Geotrygon montana* L., Penard & Penard, 1908, p. 346).

Material: 1/2. Shape and texture: as all pigeons. Ground: creamish (stained?). Measurements in mm: 24.8 × 19.8, 25.7 × 24.8. Average weight: 325 mg. Breeding time: April.

ACCIPITRES

Cathartes uribitinga Pelzeln (Peters, 1931, p. 191) (*Cathartes permigra* Sharpe, Penard & Penard, 1908, p. 363).

Material: 1/2. Shape and texture: elliptical, glossless. Ground: dirty white, somewhat bluish. Spots: handsomely blotched sienna brown, especially at large end, purplish under markings. Measurements in mm: 68.9 × 49.1, 72.3 × 47.2. Average weight: 7.25 g. Breeding time: February.

Buteo magnirostris magnirostris (Gm.) (Peters, 1931, p. 238) (*Rupornis magnirostris* Gm., Penard & Penard, 1908, p. 398).

Material: 5/1. Shape and texture: roundish. Ground: dirty white. Spots: reddish brown, yellowish brown. Some eggs are minutely spotted all over with small spots; others have large blotches. Average measurements in mm: 46.6 × 37.8. Average weight: 2.90 g. Breeding time: March-May.

Buteogallus aequinoctialis (Gm.) (Peters, 1931, p. 245) (*Buteogallus aequinoctialis* Gm., Penard & Penard, 1908, p. 402).

Material: 11/1. Shape and texture: broadly elliptical. Ground: dirty white. Spots: yellowish brown, reddish brown. Some eggs have brown hair lines. Measurements in mm: average (11 eggs) 56.7 × 43.8; minimum 53.8 × 43.5, 58.2 × 39.6; maximum 58.8 × 45.3, 56.5 × 45.5. Average weight: 4.3 g. Breeding time: February-June.

STRIGIDAE

Tyto alba hellmayri Griscom and Greenway (Peters, 1940, p. 81) (*Strix perlata* Licht., Penard & Penard, 1908, p. 446).

Material: 1/1. Shape and texture: elliptical. Ground: white. Measurements in mm: 44.6 × 33. Weight: 2.24 g (large hole). Breeding time: November.

Pulsatrix perspicillata perspicillata (Lath.) (Peters, 1940, p. 124) (*Pulsatrix perspicillata* Lath., Penard & Penard, 1908, p. 456).

Material: 1/2. Shape and texture: spherical, glossless. Ground: white. Measurements in mm: 45.2 × 38.1, 46.5 × 37.5. Average weight: 2.49 g. Breeding time: August.

Glaucidium brasilianum phalaenoides (Daudin) (Peters, 1940, p. 130) (*Scops brasiliana* Gm., Penard & Penard, 1908, p. 458).

Material: 1/2, 1/1. Shape and texture: nearly round. Ground: white. Measurements in mm: 34.6 × 28.9, 34.7 × 28.9, 32.9 × 30.3. Average weight: 1.63 g. Breeding time: May and November.

PSITTACIDAE

Ara ararauna L. (Peters, 1937, p. 181) (*Ara ararauna* L., Penard & Penard, 1908, p. 474).

Material: 1/2, 1/1. Shape and texture: elliptical. The shells of the clutch of two eggs are smooth and glossy. The shell of the other egg is glossless,

stained and with deep pores. Ground: white. Measurements in mm: 48.3×35.3 , 49.3×37.4 , 50.5×37.7 . Average weight: 3.38 g. Breeding time: February.

Aratinga pertinax aeruginosa L. (Peters, 1937, p. 189) (*Conurus aeruginosus* L., Penard & Penard, 1908, p. 488).

Material: 1/4, 1/3. Shape and texture: elliptical-spherical, glossless. Ground: white. Measurements in mm: average 25.8×20.6 ; minimum 23.8×19.9 , maximum 28.3×21.2 . Average weight: 416 mg. Breeding time: March-April.

Pyrrhura picta picta (P. L. S. Müller) (Peters, 1937, p. 197) (*Pyrrhura picta* P. L. S. Müll., Penard & Penard, 1908, p. 492).

Material: 1/2. Shape and texture: elliptical, stained. Ground: white. Average measurements in mm: 26.5×19.1 . Average weight: 421 mg, badly blown. Breeding time: February.

Forpus passerinus passerinus (L.) (Peters, 1937, p. 204) (*Psittacula guianensis* Sw., Penard & Penard, 1908, p. 496).

Material: 1/5, 2/2. Shape and texture: sperical and elliptical, glossless. Ground: white. Measurements in mm: average 17.5×14.3 ; minimum 17.2×13.3 ; maximum 18.3×14.7 , 17.2×14.9 . Average weight: 1.31 g. Breeding time: February, June, August.

Amazona amazonica amazonica (L.) (Peters, 1937, p. 222) (*Amazona amazonica* L., Penard & Penard, 1908, p. 507).

Material: 4/2, 3/1. Shape and texture: the eggs of 5 clutches are rather elliptical, glossless and stained; those of one clutch of 2 eggs are globular, rather glossy and less stained. Ground: white. Measurements in mm: average 37.4×29.1 ; minimum 35.6×28.5 , 38×27.7 ; maximum 39.1×28 , 38.2×32.5 . Average weight: 1.41 g. Breeding time: February-March.

Notes. One egg without data is very broad, viz., 38×37 mm. As I am doubtful about the identification I did not include it in the data given above.

PICIDAE

Chrysoptilus punctigula punctigula (Bodd.) (Cory, 1919, p. 445) (*Chrysoptilus punctigula* Bodd., Penard & Penard, 1908, p. 538).

Material: 1/2, 1/1. Shape and texture: oval and glossy. Ground: white. Average measurements in mm: 25.1×18.9 . Average weight: 278 mg. Breeding time: March and July.

Veniliornis sanguineus (Licht.) (Cory, 1919, p. 475) (*Veniliornis sanguineus* Licht., Penard & Penard, 1908, p. 542).

Material: 1/3, 6/2, 7/1. Shape and texture: some eggs are rather pointed,

glossy. Ground: white. Measurements in mm: average 20.3×15.3 ; minimum 17.2×13.3 ; maximum 22×15.5 , 21.2×16.3 . Average weight: 183 mg. Breeding time: February, May-September.

Veniliornis cassini (Malherbe) (Cory, 1919, p. 479) (*Veniliornis cassini* Malh., Penard & Penard, 1908, p. 545).

Material: 1/1. Shape and texture: oval, moderately glossy. Ground: white. Measurements in mm: 22.9×17 . Weight: 191 mg. Breeding time: April.

Picumnus spilogaster Sundevall (Cory, 1919, p. 504) (*Picumnus spilogaster* Sundev., Penard & Penard, 1908, p. 557).

Material: 2/2, 1/1. Shape and texture: oval and spherical, moderately glossy. Ground: white. Average measurements in mm: 15.5×12.3 . Average weight: 88 mg. Breeding time: March and June.

Picumnus buffoni Lafresnaye (Cory, 1919, p. 508) (*Picumnus penardi* Scl., Penard & Penard, 1908, p. 559).

Material: 1/3. Shape and texture: spherical, moderately glossy. Ground: white. Average measurements in mm: 14.6×12.1 . Average weight: 90 mg. Breeding time: March.

BUCCINIDAE

Chelidoptera tenebrosa tenebrosa (Pallas) (Cory, 1919, p. 409) (*Chelidoptera tenebrosa* Pall., Penard & Penard, 1908, p. 569).

Material: 13/2, 5/1. Shape and texture: spherical, glossy. Ground: white. Measurements in mm: average 24.3×19.9 ; minimum 22.6×19.6 , 24×19 ; maximum 26.1×20.3 , 25.3×21.1 . Average weight: 261 mg. Breeding time: September-November, one clutch in March.

GALBULIDAE

Galbula galbula (L.) (Cory, 1919, p. 382) (*Galbula viridis* L., Penard & Penard, 1908, p. 573).

Material: 3/2. Shape and texture: spherical, glossy. Ground: white. Measurements in mm: average 22.5×18.9 ; minimum 21.8×18.6 ; maximum 23.4×19.3 . Average weight: 254 mg. Breeding time: March, April, and September.

CUCULIDAE

Coccyzus minor maynardi (Ridgway) (Peters, 1940, p. 42) (*Coccyzus minor* Gm., Penard & Penard, 1910, p. 20).

Material: 1/2 (U. S. A.). Shape and texture: broadly elliptical, glossless. Ground: light greenish blue. Average measurements in mm: 29.2×22.5 . Average weight: 488 mg. Breeding time: June.

Coccyzus melacoryphus Vieill. (Peters, 1940, p. 44) (*Coccyzus melancoryphus* Vieill., Penard & Penard, 1910, p. 21).

Material: 1/3 and 2/1 (South Brazil). Shape and texture: elliptical, glossless. Ground: greenish white. Average measurements in mm: clutch of 3: 28.3×21.4 ; the two single eggs: 25.4×19.4 . Average weight: clutch of 3: 517 mg; the two single eggs: 400 g. Breeding time: October and December.

Notes. As the difference in measurement and weight between the clutch of 3 and the two single eggs is very large, I have some doubt about the identification.

Piaya cayana cayana (L.) (Peters, 1940, p. 47) (*Piaya cayana* L., Penard & Penard, 1910, p. 26).

Material: 2/2, 3/1. Shape and texture: elliptical, glossless. Ground: white. Measurements in mm: average 32.4×23.5 ; minimum 31.2×22.6 , 31.9×22.4 , maximum 35.6×23.3 , 31.6×24.6 . Average weight: 736 mg. Breeding time: March-July, one in September.

Piaya minuta minuta (Vieill.) (Peters, 1940, p. 49) (*Piaya minuta* Vieill., Penard & Penard, 1910, p. 28).

Material: 2/2, 1/1. Shape and texture: spherical, glossless. Ground: white. Measurements in mm: average 24.3×19.5 ; minimum 23.5×18.9 ; maximum 25.5×20.1 . Average weight: 432 mg. Breeding time: June, July, September.

Tapera naevia naevia (L.) (Peters, 1940, p. 58) (*Diplopterus naevius* L., Penard & Penard, 1910, p. 30).

Material 77 (see below). Shape and texture: elliptical, rarely spherical, glossless. Ground: light greenish blue, as light heron eggs; some eggs nearly white. Measurements in mm: average (50 eggs) 21.24×16.26 ; minimum 18.7×15.6 , 19.4×14.1 ; maximum 23.5×16.6 , 21.6×17.3 . Average weight: 183 mg. Breeding time: January-September, chiefly April-June, one clutch in September.

Notes. The eggs consist of the following sets (according to the labels, as some eggs are broken):

2/3, 5/2, 32/1 without fosters,

one egg each with 3/1, 1/2, 7/3, 3/4 of *Synallaxis cinnamomea* (Lafresn.),
two eggs each with 2/1 of *Synallaxis cinnamomea*, three eggs each with 2/3 of *Synallaxis cinnamomea*,

one egg each with 2/2 of *Synallaxis gujanensis* (Gm.),

one egg each with 2/2 of *Synallaxis albescens* Temm.,

one egg with 1/2 of *Arundinicola leucocephala* (L.).

Dromococcyx pavoninus Pelz. (Peters, 1940, p. 60) (*Dromococcyx pavoninus* Pelz., Penard & Penard, 1910, p. 34).

Material: 35 (see below). Shape and texture: elliptical, some eggs spherical, one clutch of two eggs pointed; glossless. Ground: white. Spots: unmarked. Measurements in mm: average 21.42×15.9 ; minimum 19.9×16.5 ; 21.4×14.9 ; maximum 23×15.1 , 21.8×16.9 . Average weight: 177 mg. Breeding time: January-August, chiefly June, one in October.

Notes. The eggs consist of the following sets (according to the labels, as some eggs are broken):

16/1, 3/2 without fosters,
 one egg each with 1/1, 1/2, 1/3 of *Synallaxis cinnamomea* (Lafresn.),
 one egg with 1/1 of *Synallaxis gujanensis* (Gm.), two eggs each with 3/1 of *Synallaxis gujanensis*,
 one egg with 1/2 of *Synallaxis albescens* Temm.,
 one egg with 1/3 of *Synallaxis poliophrys* Cab.,
 one egg with 1/1 of *Arundinicola leucocephala* (L.).

Schönwetter (1933) doubts whether the identification of the above mentioned eggs by the Penard's as those of *Dromococcyx pavoninus* is correct. According to Schönwetter in all probability these eggs are from *Tapera naevia*.

Crotophaga ani L. (Peters, 1940, p. 57) (*Crotophaga ani* L., Penard & Penard, 1910, p. 36).

Material: 1/21, 2/18, 1/17, 2/15, 3/13, 2/12, 2/10, 3/9, 8/8, 6/7, 8/6, 8/5, 16/4, 12/3, 18/2, 4/1. Shape and texture: broadly elliptical. Ground: greenish glaucous blue (Ridgway), but always covered with a chalky coat, on account of which the ground is hardly visible. Measurements in mm: average (50 eggs) 35.1×26.5 ; minimum 29.8×24.3 , 30.7×23.8 ; maximum 39.3×27.9 , 38.3×28.7 . Average weight: 1.15 g. Breeding time: nearly the whole year, least in October and November.

Crotophaga major Gm. (Peters, 1940, p. 57) (*Crotophaga major* Gm., Penard & Penard, 1910, p. 39).

Material: 1/9, 4/8, 2/6, 2/5, 1/4, 2/3, 2/2. Shape and texture: broadly elliptical. Ground: greenish glaucous blue, but always covered with a chalky coat (see *Cr. ani*). Measurements in mm: average (50 eggs) 43.24×35.69 ; minimum: 39.1×34.3 , 41.6×31.3 ; maximum 47.2×36.7 , 41.6×38.4 .

Average weight: 2.41 g. Breeding time: April-August, one set in September.

TROGONIDAE

Trogon strigilatus strigilatus L. (Cory, 1919, p. 328) (*Trogon viridis* L., Penard & Penard, 1910, p. 47).

Material: 2/3, 4/2, 3/1. Shape and texture: pointedly elongated to spherical, moderately glossy. Ground: white. Spots: unmarked. Measurements

in mm: average 30.9×23.7 ; minimum 28.1×23.7 , 29.1×22.5 ; maximum 34.4×23.2 , 32×24.8 . Average weight: 634 mg. Breeding time: February-June.

Notes. Though there is a great difference in the length, the breadth differs only slightly.

ALCEDINIDAE

Streptoceryle torquata torquata (L.) (Cory, 1918, p. 101) (*Ceryle torquata* L., Penard & Penard, 1910, p. 58).

Material: 1/2. Shape and texture: pointedly elongated, moderately glossy. Ground: white. Average measurements in mm: 47.1×34.4 . Average weight: 1.88 g. Breeding time: March.

Chloroceryle americana americana (Gm.) (Cory, 1918, p. 103) (*Ceryle americana* Gm., Penard & Penard, 1910, p. 63).

Material: 2/4, 3/2. Shape and texture: spherical, one egg elongated, glossy. Ground: white. Measurements in mm: average 22.4×18.1 ; minimum 20.1×17.2 , 21.5×17 ; maximum 24.6×18.2 , 22.7×18.7 . Average weight: 221 mg. Breeding time: May-August, December.

Chloroceryle aenea aenea (Pallas) (Cory, 1918, p. 105) (*Ceryle superciliosa* L., Penard & Penard, 1910, p. 64).

Material: 1/4. Shape and texture: spherical, glossy. Average measurements in mm: 18.6×15.6 . Average weight: 139 mg. Breeding time: June.

CAPRIMULGIDAE

Caprimulgus cayennensis cayennensis Gm. (Peters, 1940, p. 201) (*Stenopsis cayennensis* Gm., Penard & Penard, 1910, p. 79).

Material: 6/1. Shape and texture: elliptical, glossy. Ground: pinkish cream. Spots: greyish lilac. Measurements in mm: average 27.2×19.6 ; minimum 25.9×19.8 , 27.8×18.9 ; maximum 28.5×20.8 . Average weight: 461 mg. Breeding time: February, April, June, September, October.

Nyctidromus albicollis albicollis (Gm.) (Peters, 1940, p. 193) (*Nyctidromus albicollis* Gm., Penard & Penard, 1910, p. 81).

Material: 4/2, 25/1. Shape and texture: elliptical, glossy. Ground: warm pinkish cream. Spots: greyish lilac and light purplish brown. Varieties: some eggs are rather sparingly marked with blotches. Measurements in mm: average (33 eggs) 29.4×21.7 ; minimum: 27.3×21.9 , 27.9×19.6 ; maximum 32.6×22.1 , 32.4×23 . Average weight: 507 mg. Breeding time: January, May, June, July, August, September, October.

Notes. In proportion to the size of the eggs the differences in measurements are important.

In the collection there are also 6 eggs of *Chordeiles acutipennis* (Herm.), but these eggs are so different from each other, that I thought it better not to include them in this list.

CYPSELIDAE

Panyptila cayennensis (Gm.) (Peters, 1940, p. 254) (*Panyptila cayennensis* Gm., Penard & Penard, 1910, p. 96).

Material: 1/3. Shape and texture: very elongately elliptical, glossless. Ground: white. Average measurements in mm: 21.3 × 12.8. Average weight: 102 mg. Breeding time: ?

TROCHILIDAE

Glaucis hirsuta hirsuta (Gm.) (Cory, 1918, p. 151) (*Glaucis hirsuta* Gm., Penard & Penard, 1910, p. 111).

Material: 1/3 (?), 5/2, 13/1. Shape and texture: elongately elliptical, glossless. Ground: white. Measurements in mm: average 15.3 × 9.2; minimum 14.5 × 8.6; maximum 16.5 × 9.2, 15.6 × 10. Average weight: 34 mg. Breeding time: April-June, September.

Phaethornis spec.? (Cory, 1918, p. 159?) (*Phaethornis squalidus* Natt., Penard & Penard, 1910, p. 114).

Material: 4/1, 1/2. Shape and texture: as all Trochilidae. Ground: white. Measurements in mm: average 12 × 7.7; minimum 11.4 × 7.4, 12.4 × 7.1; maximum 12.7 × 8.1. Average weight: 16 mg. Breeding time: January, February, April, May, September.

Notes. Identification uncertain.

Agyrtrina chionopectus whitelyi (Boucard) (Cory, 1918, p. 175) (*Agyrtrina chionopectus* Gould, Penard & Penard, 1910, p. 121).

Material: 2/2, 1/1. Shape and texture: as all Trochilidae. Ground: white. Measurements in mm: average 12.8 × 8.9; minimum 12.2 × 8.8; maximum 14.2 × 9. Average weight: 28 mg. Breeding time: March, April, August.

Agyrtrina spec. (Cory, 1918, p. 177?) (*Agyrtrina* spec., Penard & Penard, 1910, p. 122).

Material: 9/1, 14/2. Shape and texture: elongately elliptical, glossless. Ground: white. Measurements in mm: average 13.5 × 8.9; minimum 12.4 × 9.2, 13 × 8.2; maximum 14.8 × 9.5. Average weight: 28 mg (22-38). Breeding time: March-October.

Notes. The identification of the species of *Agyrtrina* by Penard & Penard is not certain.

Agyrtrina tephrocephala (Vieill.) ?(Cory, 1918, p. 179) (*Agyrtrina tephrocephala* Vieill.?, Penard & Penard, 1910, p. 123).

Material: 2/2, 2/1. Shape and texture: as all Trochilidae. Ground: white. Measurements in mm: average 12.9×8.8 . Average weight: 24 mg. Breeding time: March, June, August.

Notes. As concerning the other species of *Argyrtrina*.

Chlorostilbon prasinus prasinus (Lesson) (Cory, 1918, p. 205) (*Chlorostilbon subfurcatus* Berl. (?), Penard & Penard, 1910, p. 127).

Material: 1/1. Ground: white. Measurements in mm: 11.7×7.6 . Weight: 15 mg. Breeding time: not mentioned.

Anthracothorax violicauda violicauda (Bodd.) (Cory, 1918, p. 222) (*Lampornis violicauda* Bodd., Penard & Penard, 1910, p. 130).

Material: 1/4 (?), 3/2, 2/1. Shape and texture: elongately elliptical, glossless. Ground: white. Measurements in mm: average 15.2×10.2 ; minimum 14.3×10.5 ; 14.9×9.8 ; maximum 15.9×10.2 , 15.4×10.8 . Average weight: 44 mg. Breeding time: June-August, October.

Anthracothorax viridigula (Bodd.) (Cory, 1918, p. 224) (*Lampornis gramineus* Gm., Penard & Penard, 1910, p. 131).

Material: 1/2, 2/1. Shape and texture: as all Trochilidae. Ground: white. Measurements in mm: average 14.3×9.3 . Average weight: 30 mg. Breeding time: April, May.

Chrysolampis elatus (L.) (Cory, 1918, p. 225) (*Chrysolampis mosquitus* L., Penard & Penard, 1910, p. 132).

Material: 1/1. Shape and texture: as all Trochilidae. Ground: white. Measurements in mm: 14.9×9.8 . Weight: 32 mg. Breeding time: September.

Lophornis ornatus (Bodd.) (Cory, 1918, p. 309) (*Lophornis ornatus* Bodd., Penard & Penard, 1910, p. 140).

Material: 1/1. Ground: white. Measurements in mm: 10.9×7.5 . Weight: 14 mg. Breeding time: not mentioned.

COTINGIDAE

Pachyrhamphus rufus (Bodd.) (Hellmayr, 1929, p. 169) (*Pachyrhamphus cinereus* Bodd., Penard & Penard, 1910, p. 153).

Material: 1/4, 10/3, 14/2, 5/1. Shape and texture: nearly glossless. Ground: vinaceous buff (Ridgway). Spots: dark chocolate brown, forming a handsome zone or cap, the small end nearly unmarked. Varieties: a single egg has the ground very pale, nearly white, others are nearly unmarked on normal ground. Measurements in mm: average (50 eggs) 20.09×14.84 ; minimum 18.6×13.5 ; maximum 21.9×15.4 , 21×15.6 . Average weight: 119 mg. Breeding time: the whole year, except November and December.

Attila cinnamomeus cinnamomeus (Gm.) (Hellmayr, 1929, p. 145) (*Attila thamnophiloides* Spix, Penard & Penard, 1910, p. 160).

Material: 2/3. Shape and texture: broadly oval, moderately glossy. Ground: pinkish (salmon) cream. Spots: reddish brown and purplish under markings. The eggs are very beautiful, the large spots chiefly at the large end forming a zone. Measurements in mm: average 22.7×17.8 ; minimum 22×17.3 ; maximum 23.3×18.2 . Average weight: 219 mg. Breeding time: April.

PIPRIDAE

Pipra aureola aureola (L.) (Hellmayr, 1929, p. 8) (*Pipra aureola* L., Penard & Penard, 1910, p. 188).

Material: 3/2, 6/1. Shape and texture: broadly oval, nearly round or more elongated, nearly glossless. Ground: yellowish white, greenish white, pinkish white, light buff. Spots: light and dark sienna brown, greyish brown, purplish brown, on some eggs forming a zone; mostly the spots are longitudinal. Measurements in mm: average 20.5×15.1 ; minimum 19.4×15 , 20.2×14.1 ; maximum 21.7×15.1 , 20.3×15.5 . Average weight: 122 mg. Breeding time: March-May, one in October.

Notes. The eggs are very variable, as much as those of the Palearctic Tree-pipit, *Anthus trivialis trivialis* (L.).

Manacus manacus manacus (L.) (Hellmayr, 1929, p. 65) (*Chiromachairis manacus* L., Penard & Penard, 1910, p. 194).

Material: 1/2. Shape and texture: oval, nearly glossless. Ground: yellowish white. Spots: sienna brown, forming a zone. Average measurements in mm: 19.4×14.5 . Average weight: 107 mg. Breeding time: March.

TYRANNIDAE

Fluvicola pica pica (Bodd.) (Hellmayr, 1927, p. 81) (*Fluvicola pica* Bodd., Penard & Penard, 1910, p. 207).

Material: 5/3, 16/2. Shape and texture: oval, sometimes spherical, nearly glossless. Ground: white. Spots: marked at the large end with small, but also with larger spots of red-brown (as a rule much larger than in *Todirostrum*). Measurements in mm: average (47 eggs) 18.45×13.6 ; minimum 17.1×13 , 17.6×12.7 , maximum 19.6×13.7 , 18.2×14.5 . Average weight: 94 mg. Breeding time: January-August, except March; chiefly July.

Arundinicola leucocephala (L.) (Hellmayr, 1927, p. 85) (*Arundinicola leucocephala* L., Penard & Penard 1910, p. 208).

Material: 6/3, 29/1, 6/1. Shape and texture: elliptical, rather long,

moderately glossy. Ground: white. Spots: unmarked. Varieties: 1/2 set with very small reddish spots. Measurements in mm: average (50 eggs) 19.41×13.74 ; minimum 17.5×13.6 , 19.6×13.2 ; maximum 21.4×13.6 , 19.8×14.3 . Average weight: 103 mg. Breeding time: February-October, one in January and one in November.

Todirostrum cinereum cinereum (L.) (Hellmayr, 1927, p. 297) (*Todirostrum cinereum* L., Penard & Penard, 1910, p. 212).

Material: 2/3, 86/2, 64/1. Shape and texture: elongately elliptical, the small end somewhat pointed, glossless. Most eggs may be compared with those of Hirundinidae. Ground: white. Spots: generally unmarked, but some eggs have a few very small brown spots. Measurements in mm: average (50 eggs) 16.66×11.54 ; minimum 15.5×11.3 , 16.1×10.8 ; maximum 18.7×12.6 . Average weight: 57 mg. Breeding time: January-July, chiefly April-June, two in August, one in September and one in December.

Todirostrum maculatum maculatum (Desm.) (Hellmayr, 1927, p. 301) (*Todirostrum surinamense* Penard and Penard, Penard & Penard, 1910, p. 214).

Material: 13/2. Shape and texture: rather elongated; glossless. Ground: white. Spots: partly with small brown spots at the large end (see next species). Measurements in mm: average (26 eggs) 16.8×11.7 ; minimum 15.4×11.8 , 15.8×11.1 ; maximum 18.3×11.7 , 17×12.2 . Average weight: 58 mg. Breeding time: chiefly April-June, two in January, two in February, one in August, one in September.

Notes. According to Hellmayr (1927) there is no difference between *Tod. maculatum maculatum* (Desm.) and *Tod. surinamense* Penard & Penard. The difference between the eggs, however, is plain.

Todirostrum maculatum maculatum (Desm.) (Hellmayr, 1927, p. 301) (*Todirostrum maculatum* Desm., Penard & Penard, 1910, p. 214).

Material: 13/2, 13/1. Shape and texture: rather elongated, glossless. Ground: white. Spots: most of the eggs marked with light and dark brown, chiefly at the large end, more distinctly and more boldly than in those of *Todirostrum surinamense*. Measurements in mm: average (38 eggs) 16.7×11.7 ; minimum 15.9×11.4 , 16.4×10.9 ; maximum 17.8×11.9 , 17.7×12.2 . Average weight: 59 mg. Breeding time: January-July (except March).

Todirostrum pictum Salv. (Hellmayr, 1927, p. 295) (*Todirostrum pictum* Salv., Penard & Penard, 1910, p. 215).

Material: 2/2, 2/1. Shape and texture: elongated, glossless. Ground: white. Spots: as in the eggs of *Todirostrum maculatum* (Desm.).

measurements in mm: average 17.5×12.1 ; minimum 16.2×12.1 , 17.7×11.8 ; maximum 18.8×12 , 18.2×12.3 . Average weight: 63 mg. Breeding time: May-June.

Todirostrum fumifrons penardi Hellmayr (Hellmayr, 1927, p. 304) (*Euscarthmus fumifrons* Hartl., Penard & Penard, 1910, p. 216).

Material: 2/2, 3/1. Shape and texture: oval, glossless. Ground: whitish. Spots: small purplish brown spots, chiefly at the large end, but also equally divided. Measurements in mm: average 16.6×12.2 ; minimum 15.9×11.9 ; maximum 18.1×12.7 . Average weight: 58 mg. Breeding time: March-May.

Lophotriccus pileatus squamaecrista (Lafresnaye) (Hellmayr, 1927, p. 329) (*Lophotriccus squamicristatus* Lafr., Penard & Penard, 1910, p. 217).

Material: 1/2. Shape and texture: oval, moderately glossy. Ground: reddish cream. Spots: beautiful reddish brown, chiefly at the large end. Measurements in mm: 18.1×13.1 and 17.4×12.8 . Average weight: 68 mg. Breeding time: August.

Notes. According to Hellmayr (1927) this species does not occur in Dutch Guyana.

Colopteryx galeatus (Bodd.) (Hellmayr, 1927, p. 333) (*Colopteryx galeatus* Bodd., Penard & Penard, 1910, p. 218).

Material: 1/1. Shape and texture: glossless. Ground: white. Spots: unmarked. Measurements in mm: 16.1×11.7 . Weight: 57 mg. Breeding time: March.

Inezia subflava caudata (Salv.) (Hellmayr, 1927, p. 389) (*Serpophaga caudata* Salv., Penard & Penard, 1910, p. 219).

Material: 3/2, 4/1. Shape and texture: broadly oval, glossless. Ground: white. Spots: unmarked. Varieties: one egg shows 5 small spots of purplish brown colour. Measurements in mm: average 16.4×12.5 ; minimum 15.4×12.5 , 16.4×12 ; maximum 17.6×12.8 , 16×13 . Average weight: 67 mg. Breeding time: January, March, April, May.

Phaeomyias murina incomta (Cab. & Heine) (Hellmayr, 1927, p. 450) (*Myiopatris semifusca* Scl., Penard & Penard, 1910, p. 224).

Material: 1/3, 19/2, 11/1. Shape and texture: broadly oval, some sets spherical, glossless. Ground: white, light creamish. Spots: unmarked. Measurements in mm: average (50 eggs) 17.07×13.03 ; minimum 15.7×13.2 , 17.4×12 ; maximum 18.4×13.1 , 16.1×13.8 . Average weight: 80 mg. Breeding time: January-July, except March.

Camptostoma obsoletum napaeum (Ridgway) (Hellmayr, 1927, p. 458) (*Ornithion pusillum* Cab. & Heine, Penard & Penard, 1910, p. 225).

Material: 1/2. Shape and texture: broadly oval, nearly round, gloss-

less. Ground: white, creamish. Spots: unmarked. Measurements in mm: 16×13.1 and 16.4×13.4 . Average weight: 76 mg. Breeding time: May.

Tyranniscus gracilipes gracilipes Scl. & Salv. (Hellmayr, 1927, p. 475) (*Tyranniscus gracilipes* Scl. & Salv., Penard & Penard, 1910, p. 228).

Material: 4/1. Shape and texture: oval, glossless. Ground: whitish, light creamish. Spots: unmarked. Average measurements in mm: 15.1×11.1 . Average weight: 47 mg. Breeding time: September.

Tyrannulus elatus elatus (Lath.) (Hellmayr, 1927, p. 477) (*Tyrannulus elatus* Lath., Penard & Penard, 1910, p. 229).

Material: 2/1. Shape and texture: broadly oval, glossless. Ground: creamish. Spots: unmarked. Measurements in mm: 16.4×12.1 , 15.1×11.9 . Average weight: 65 mg. Breeding time: February, May.

Elaenia gaimardii guianensis Berlepsch (Hellmayr, 1927, p. 430) (*Myiopagis gaimardi* d'Orb., Penard & Penard, 1910, p. 232).

Material: 5/2. Shape and texture: broadly oval, glossless. Ground: whitish, creamish. Spots: unmarked (according to Penard & Penard sometimes with small spots). Measurements in mm: average 17.26×13.51 ; minimum 16.5×13.5 , 17.3×13.1 ; maximum 18.1×14.1 . Weight: 80 mg. Breeding time: March, April, June.

Elaenia flavogaster flavogaster (Thunberg) (Hellmayr, 1927, p. 402) (*Elainea pagana* Licht., Penard & Penard, 1910, p. 233).

Material: 1/4, 78/2, 51/1. Shape and texture: long and broadly oval, glossless. Ground: creamish and whitish, some eggs pinkish. Spots: reddish and purplish brown, purplish under markings, chiefly at the large end and forming a zone. Measurements in mm: average (54 eggs) 21.7×15.6 ; minimum 18.4×14.2 ; maximum 23.9×16.2 , 22.8×17.2 . Average weight: 156 mg. Breeding time: January-July, moreover 1 in August, 4 in September, 1 in October, and 1 in November.

Notes. The eggs of this species often resemble those of *Myiozetetes cayennensis* (L.), but the markings on the eggs of the latter are darker, not so red, with fewer under markings.

Legatus leucophaius leucophaius (Vieill.) (Hellmayr, 1927, p. 117) (*Legatus albicollis* Vieill., Penard & Penard, 1910, p. 236).

Material: 1/3, 10/2, 5/1. Shape and texture: oval, glossless. Ground: dirty brown, as a rule rather dark, but sometimes yellowish brown (sayal brown and pinkish buff, Ridgway). Spots: small chocolate brown and blackish brown spots and hair lines. Varieties: 1/2 set of more pointed form has a dirty white ground and a cap of more sienna brown blotches. This set is also somewhat glossy. Measurements in mm: average 22.8×16.8 ; minimum 21.3×16.4 , 21.6×14.8 ; maximum 25.4×17.2 . Average weight: 149 mm. Breeding time: February-March, one in June.

Notes. I do not agree with Penard & Penard's remark that the eggs resemble those of the *Pachyrhamphi*. The latter are much greyer.

Myiozetetes cayanensis cayanensis (L.) (Hellmayr, 1927, p. 138) (*Myiozetetes cayennensis* L., Penard & Penard, 1910, p. 237).

Material: 45/3, 129/2, 112/1. Shape and texture: oval, glossless. Ground: white, creamish white. Spots: purplish brown, chiefly at the large end and often forming a zone, few purplish under markings. On some eggs the markings are small, on others large. Varieties: some eggs nearly unmarked. Measurements in mm: average (50 eggs) 22.53×16.05 ; minimum 20.4×17 , 20.1×14.4 ; maximum 25.6×17.8 . Average weight: 152 mg. Breeding time: chiefly January-July, 2 in August, 1 in September, 1 in October, 1 in November, and 2 in December.

Tolmomyias flaviventris aurentis (Todd) (Hellmayr, 1927, p. 285) (*Rhynchocyclus flaviventris* Max., Penard & Penard, 1910, p. 241).

Material: 3/2. Shape and texture: oval, glossless. Ground: light creamish. Spots: small dark purplish brown, chiefly at the large end. Average measurements in mm: 20.1×13.9 . Average weight: 103 mg. Breeding time: January, March.

Pitangus sulphuratus sulphuratus (L.) (Hellmayr, 1927, p. 151) (*Pitangus sulphuratus* L., Penard & Penard, 1910, p. 243).

Material: 3/5, 14/4, 82/3, 55/2, 101/1. Shape and texture: oval, in some cases spherical, moderately glossy. Ground: light yellowish cream. Spots: purplish black and purplish brown and a few purplish under markings, chiefly at the large end, sometimes forming a zone. On some eggs the markings are small, on others large. Varieties: unmarked. Measurements in mm: average (50 eggs) 27.9×20.03 ; minimum 24.2×18.7 , 27.3×18.4 ; maximum 32.4×19.6 , 29.1×21.4 . Average weight: 298 mg. Breeding time: January-June, 2 in July, 3 in August, 3 in September, 4 in October, 1 in November, 5 in December.

Pitangus lictor lictor (Licht.) (Hellmayr, 1927, p. 154) (*Pitangus lictor* Licht., Penard & Penard, 1910, p. 246).

Material: 4/4, 11/3, 24/2, 21/1. Shape and texture: broadly oval, spherical, glossless. Ground: whitish cream, yellowish cream. Spots: boldly marked dark purplish brown, chiefly at the large end, sometimes forming a zone or cap. Occasionally more reddish brown or nearly black. Purplish under markings. Measurements in mm: average (50 eggs) 20.7×16.04 ; minimum 18.7×16 , 19.8×14.3 ; maximum 22.9×16.2 , 22×17.2 . Average weight: 159 mg. Breeding time: January-June, 1 in July, 2 in August, 1 in November, 1 in December.

Notes. 1/2 set from Argentina is more sparingly marked, 20.7×16 mm and 148 mg.

Myiodynastes maculatus maculatus (Müller) (Hellmayr, 1927, p. 122) (*Myiodynastes audax* Gm., Penard & Penard, 1910, p. 247).

Material: 1/2. Shape and texture: oval, glossless. Ground: pinkish cream. Spots: nearly quite covered, with purplish brown and purplish spots. Measurements in mm: 27.8×19.4 , 27.1×19.1 . Average weight: 270 mg. Breeding time: July.

Myiophobus fasciatus fasciatus (Müller) (Hellmayr, 1927, p. 251) (*Myiobius naevius* Bodd., Penard & Penard, 1910, p. 256).

Material: 13/2, 11/1. Shape and texture: elliptical, glossless. Ground: warm yellowish cream, light cream. Spots: rather light reddish brown, in some cases only dark reddish brown, chiefly at the large end, forming a zone. Measurements in mm: average 17.9×13.1 ; minimum 16.6×12.9 , 17.6×12.1 ; maximum 18.7×13.2 , 18.2×13.9 . Average weight: 85 mg. Breeding time: January-July, except March, one in October and one in December.

Notes. 1/4 (set?) of S. Brazil is of much larger average: 19.2×13.6 ; weight: 99 mg.

Myiarchus phaeonotus Salv. & Godm. (Hellmayr, 1927, p. 174) (*Myiarchus phaeonotus* Salv. & Godm., Penard & Penard, 1910, p. 261).

Material: 2/3, 1/2. Shape and texture: broadly oval, somewhat glossy. Ground: creamish. Spots: network of purplish brown and purplish lines and spots. Measurements in mm: average 22.7×17.1 ; minimum 21.9×16.7 ; maximum 24.2×16.7 , 22.3×17.8 . Average weight: 193 mg. Breeding time: June and September.

Notes. Hellmayr (1927) does not mention this species from Dutch Guyana.

Tyrannus melancholicus despotes (Licht.) (Hellmayr, 1927, p. 107) (*Tyrannus melancholicus* Vieill., Penard & Penard, 1910, p. 263).

Material: 2/3, 27/2, 30/1. Shape and texture: oval, moderately glossy. Ground: light and warm creamish, some eggs pinkish. Spots: very handsomely and boldly blotched with sienna brown, dark brown and purplish brown, purplish under markings, chiefly at the large end and then forming a zone. In most cases the spots are longitudinal. Measurements in mm: average (50 eggs) 24.98×17.84 ; minimum 23.2×16.8 , 23.5×16.2 ; maximum 27.7×18.2 , 24×18.9 . Average weight: 226 mg. Breeding time: January-September.

Tyrannus dominicensis vorax Vieill. (Hellmayr, 1927, p. 111) (*Tyrannus rostratus* Scl., Penard & Penard, 1910, p. 264).

Material: 1/2. Shape and texture: broadly oval, nearly glossless. Ground: pinkish cream. Spots: handsomely and boldly blotched sienna brown and purplish under markings, chiefly at the large end. Measurements in mm:

24.2 × 18.6, 26 × 18.5. Average weight: 227 mg. Breeding time: February.

Notes. According to Hellmayr (1927) this species does not occur in Dutch Guyana, according to Penard & Penard it rarely does occur here.

DENDROCOLAPTIDAE

Certhiaxis cinnamomea cinnamomea (Gm.) (Hellmayr, 1925, p. 112) (*Synallaxis cinnamomea* Gm., Penard & Penard, 1910, p. 272).

Material: 6/5, 20/4, 41/3, 31/2, 56/1. Shape and texture: broadly elliptical-spherical, glossless. Ground: white with greenish tinge. Spots: unmarked. Varieties: one egg clearly marked with small dark brown spots (a large egg: 21.5 × 15.9!). Measurements in mm: average (50 eggs) 19 × 15.12; minimum 16.7 × 13.4; maximum 21.5 × 15.9 (an unmarked egg: 20.6 × 15.5). Average weight: 138 mg. Breeding time: January-August, one in September.

Synallaxis poliophrys Cab. (Hellmayr, 1925, p. 76) (*Synallaxis poliophrys* Cab., Penard & Penard, 1910, p. 273).

Material: 7/3, 2/2, 7/1. Shape and texture: broadly elliptical-spherical, glossless. Ground: white with greenish tinge. Spots: unmarked. Measurements in mm: average 17.9 × 14.5; minimum 16.6 × 13.5; maximum 18.7 × 14.5, 17.5 × 15.1. Average weight: 129 mg. Breeding time: January-July.

Synallaxis albescens albigularis Sclater (Hellmayr, 1925, p. 88) (*Synallaxis albescens* Temm., Penard & Penard, 1910, p. 274).

Material: 15/2, 23/1. Shape and texture: broadly elliptical-spherical, glossless. Ground: white with greenish tinge. Spots: unmarked. Measurements in mm: average (50 eggs) 21.53 × 17.23; minimum 19.1 × 17, 19.4 × 16.4; maximum 22.7 × 17.3, 21.6 × 18.1. Average weight: 184 mg. Breeding time: January, February, May, July, August, September, November.

Synallaxis gujanensis gujanensis (Gm.) (Hellmayr, 1925, p. 93) (*Synallaxis guianensis* Gm., Penard & Penard, 1910, p. 275).

Material: 1/4, 4/3, 14/2, 21/1. Shape and texture: broadly elliptical-spherical, glossless. Ground: white with greenish tinge. Spots: unmarked. Measurements in mm: average (50 eggs) 20.57 × 16.28; minimum 19.1 × 15.5; maximum 22.2 × 16.9. Average weight: 160 mg. Breeding time: January, March, May-September, chiefly May-June.

Synallaxis cinnamomea adusta Salv. & Godm. (Hellmayr, 1925, p. 105) (*Synallaxis adusta* Salv. & Godm., Penard & Penard, 1910, p. 275).

Material: 3/2. Shape and texture: broadly elliptical. Ground: white with greenish tinge. Spots: unmarked. Average measurements in mm: 20.9 × 15.9. Average weight: 147 mg. Breeding time: one in January, two in May.

Xiphorhynchus guttatus sororius (Berlepsch & Hartert) (Hellmayr, 1925, p. 297) (*Dendroornis guttatoides* Lafr., Penard & Penard, 1910, p. 284).

Material: 2/2, 2/1. Shape and texture: elliptical, glossy. Ground: white. Spots: unmarked. Measurements in mm: average 26.6×20.1 ; minimum 26×20.5 , 26.5×19.6 ; maximum 27.5×20.5 . Average weight: 426 mg. Breeding time: one clutch in July, other sets labelled only with year.

Dendroplex picus picus (Gm.) (Hellmayr, 1925, p. 288) (*Dendroplex picus* Gm., Penard & Penard, 1910, p. 287).

Material: 3/2, 1/1. Shape and texture: elliptical, moderately glossy. Ground: white. Spots: unmarked. Measurements in mm: average 25.4×19.6 ; minimum 24×19.1 ; maximum 26.6×19.9 . Average weight: 447 mg. Breeding time: one clutch in August, other sets labelled only with year.

FORMICARIIDAE

Taraba major semifasciatus (Cab.) (Cory (Hellmayr), 1924, p. 48) (*Thamnophilus major* Vieill., Penard & Penard, 1910, p. 301).

Material: 1/1 (one broken). Shape and texture: broadly elliptical. Ground: creamish white, glossless. Spots: sparsely marked with dark purplish hair lines. Measurements in mm: 28.2×21.6 . Weight: 475 mg. Breeding time: January.

Sakesphorus canadensis canadensis (L.) (Cory (Hellmayr), 1924, p. 52) (*Thamnophilus cirrhatus* Gm., Penard & Penard, 1910, p. 305).

Material: 19/2, 23/1. Shape and texture: elliptical, generally longer than those of *Thamnophilus doliatus*, rarely spherical, glossless. Ground: white, purplish white. Spots: dark purplish and purplish brown spots, blotches and also hair lines, but fewer than on eggs of *Th. doliatus*. The markings chiefly at the large end and forming a zone. The eggs make a clearer impression than those of *Th. doliatus*. Measurements in mm: average (50 eggs) 23.02×16.78 ; minimum 21.1×16.2 , 23×15.9 ; maximum 24.4×16.2 , 23.7×18 . Average weight: 189 mg. Breeding time: chiefly January-May, also in September and December.

Thamnophilus doliatus doliatus (L.) (Cory (Hellmayr), 1924, p. 62) (*Thamnophilus doliatus* L., Penard & Penard, 1910, p. 306).

Material: 20/2 (of 1/3 set one broken), 16/1. Shape and texture: elliptical, mostly short, in some cases nearly round, glossless. Ground: white, purplish white. Spots: a great many fine dark purplish hair lines generally over the whole egg and rather large dark purplish and purplish brown blotches chiefly at the large end. As a rule the white ground less visible than in the eggs of *Sakesphorus canadensis*. Measurements in mm: average (50 eggs)

23.17 × 17.05; minimum 21 × 17.2, 21.8 × 16.1; maximum 25.1 × 16.3, 21.8 × 18.2. Average weight: 190 mg. Breeding time: January-September, one in November.

Notes. The difference between the eggs of *S. canadensis* and *Th. dohiatus* can be compared with that between those of the Ortolan bunting, *Emberiza hortulana hortulana* L., and the Yellow bunting, *Emberiza citrinella citrinella* L.

Hypocnemis cantator cantator (Bodd.) (Cory (Hellmayr), 1924, p. 239) (*Hypocnemis cantator* Bodd., Penard & Penard, 1910, p. 327).

Material: 2/2, 1/1. Shape and texture: elliptical, glossless. Ground: pinkish white. Spots: small purplish grey under markings and few larger purplish spots, the latter with slight penumbra. Measurements in mm: average 19.8 × 14.5; minimum 19 × 14.3; maximum 20.5 × 14.3, 19.6 × 15. Average weight: 105 mg. Breeding time: June, October.

ICTERIDAE

Xanthornus decumanus decumanus Pall. (Hellmayr, 1937, p. 12) (*Ostinops decumanus* Pall., Penard & Penard, 1910, p. 347).

Material: 9/2, 24/1. Shape and texture: elongately oval, glossless. Ground: white, reddish white with some purplish tinge. Spots: reddish and blackish spots and hair lines; in some cases only a darker shade of the reddish ground, in other cases more clearly and boldly, especially the hair lines. Varieties: two eggs nearly white, unmarked. Measurements in mm: average 36 × 24.5; minimum 31.5 × 24.6, 37.4 × 22.4; maximum 41.1 × 25.8, 39.5 × 26.6. Average weight: 663 mg. Breeding time: January-May.

Xanthornus viridis viridis (P. L. S. Müller) (Hellmayr, 1937, p. 16) (*Ostinops viridis* Müll., Penard & Penard, 1910, p. 351).

Material: 5/1. Shape and texture: elongated, rough and glossless. Ground: pinkish white, greenish grey. Spots: purplish brown and blackish brown small spots and hair lines (see *X. decumanus*). Varieties: one egg (38.1 × 20.8 mm) has an abnormally rough shell. Measurements in mm: 37 × 21.4, 35.8 × 23.6, 39.5 × 25.1, 38.1 × 20.8, 38.2 × 22.8. Average weight: 640 mg. Breeding time: February-April.

Cacicus cela cela (L.) (Hellmayr, 1937, p. 24) (*Cassicus persicus* L., Penard & Penard, 1910, p. 352).

Material: 22/2, 26/1. Shape and texture: rather elongated, nearly glossless. Ground: white, very light bluish white. Spots: rather sparingly marked light and darker purplish brown, chiefly at the large end. Measurements in mm: average (50 eggs) 28.44 × 19.08; minimum 24.2 × 18.2, 27.5 × 17.3; maximum 32.3 × 18.5, 31.6 × 20.6. Average weight: 293 mg. Breeding time: February-May, chiefly February, 3 in December.

Cacicus haemorrhous haemorrhous (L.) (Hellmayr, 1937, p. 30)
(*Cassicus affinis* Sw., Penard & Penard, 1910, p. 356).

Material: 1/6, 5/1. Shape and texture: broadly or elongatedly oval, the 1/6 set rather glossy, the 5 single eggs nearly glossless. Ground: white. Spots: some large and several small purplish brown spots chiefly at the large end and purplish under markings. Some eggs have blackish brown spots. Measurements in mm: average 27.9×20.5 ; minimum 25.5×20.3 , 30.4×18.3 ; maximum 30.8×20 , 28×21.6 . Average weight: 327 mg. Breeding time: June and November.

Psomocolax oryzivorus oryzivorus (Gm.) (Hellmayr, 1937, p. 47)
(*Cassidix oryzivora* Gm., Penard & Penard, 1910, p. 357).

(Foster *Xanthornus*).

Material: 6/2, 5/1. Shape and texture: more elongately oval, nearly glossless. Ground: white. Spots: rather sparingly marked with small and rather large blotches of blackish colour, rarely dark brown. Often some hair lines of the same colour. Few purplish under markings chiefly at the large end. Measurements in mm: average (17 eggs) 35.7×34.3 ; minimum 32.5×23.4 (580 mg), 33.7×22.4 (530 mg); maximum 40.1×24.2 (695 mg), 37.6×25.6 (755 mg). Average weight: 644 mg (530—755). Breeding time: January-April, one in May.

Psomocolax oryzivorus oryzivorus (Gm.) (Hellmayr, 1937, p. 47)
(*Cassidix oryzivora* Gm., Penard & Penard, 1910, p. 357).

(Forster *Cacicus*).

Material: 3/2, 28/1. Shape and texture: broadly oval, somewhat rough, moderately glossy. Ground: light bluish or bluish green. Spots: sparingly marked with small and rather large blotches of a blackish colour, rarely brown. Often some hair lines of the same colour. Few purplish under markings, chiefly at the large end. Measurements in mm: average (34 eggs) 34×25.5 ; minimum 31.5×24.3 (770 mg), 34.4×23.8 (800 mg); maximum 35.5×27.3 (1080 mg), 35.1×29 (1085 mg). Average weight: 942 mg (770—1130). Breeding time: January-April, one in May, one in June and one in December.

Notes. 2/1 sets with one and two eggs of *Cacicus cela* (L.) respectively.

It is very interesting that according to Penard & Penard *Psomocolax oryzivorus* lays two types of eggs:

1) with *Cacicus*, especially *C. cela*, the eggs are broadly oval, the shell is somewhat rough, harder, and moderately glossy. The ground is light bluish or light bluish green. The forster eggs are not broken or removed.

2) with *Xanthornus* the eggs are more elongatedly oval, the shell is nearly glossless and white. The forster eggs are broken or removed.

Penard & Penard consider two possibilities:

a) *P. oryzivorus* encloses two species not distinguishable to our eyes (till now).

b) The birds raised in nests of *Cacicus* always lay their eggs with the same foster and those raised in nests of *Xanthornus* have the same habit.

I thought it advisable to separate these two types of eggs. Very curious is the very great difference in weight. It is so great that I can hardly believe of one species.

I wrote about this question to Mr. M. Schönwetter, who answered me as follows: "Der Unterschied ist mir bei meinem Besuch der Leidener Sammlung natürlich auch aufgefallen und in meinem Notizheft schrieb ich damals "ob 2 Arten?". An sich ist ein Unterschied im Schalengewicht von 0,647-0,930 g und selbst mehr nicht selten und noch grössere Unterschiede fand ich bei vielen Arten. Auffallend bleibt aber, dass es 2 Gruppen zu sein scheinen, eine mit grösserem, eine mit kleinerem Gewicht. Blaugrundige und weissgrundige Eier von *Cassidix* erhielt ich auch aus Bolivien. Diese messen $33,1-38,6 \times 23,7-25,1 = 0,64-1,05$ g und ebensolche kenne ich aus den Sammlungen Pässler, v. Treskow und Nehr-korn. Es sind aber nicht viele, sodass ich "Gruppen" nicht erkennen konnte. Auch sind alle Übergänge im Schalengewicht von leichten bis zu schweren da, ganz wie bei Penard. Die ersten, als zu *Cassidix* gehörig erkannten Eier aus Para in der Kuschelsammlung (jetzt im Museum Dresden), von denen ich auch ein Gelege mit *Cassicus persicus* besitze, sind schmutzigweiss im Grund, nicht so reinweiss wie die aus Surinam und Bolivien, und messen $32,3-35,2 \times 23,3-24,2 = 0,75-0,85$ g. Bei den Bolivia-Eiern sind auch einzelne mit grünem Grund und ganz verwaschener, verwischter Fleckung. Alles ist noch ungeklärt und ist auch sehr schwer zu enträtseln. Ich habe schon gedacht, dass vielleicht *Ostinops viridis* Cabanis Parasit sein könnte, dessen Eier ganz wie die weissen "*Cassidix*" beschrieben werden im Aussehen und in der Grösse. Übrigens liegen in Leiden 2 ebensolche Eier unter dem mir ganz unbekanntem Namen "*Icterus puniceus*". Es wäre uns allen eine Freude, wenn Sie die Rätsel lösen könnten."

Molothrus bonariensis minimus Dalmás (Hellmayr, 1937, p. 57) (*Molothrus atronitens* Cab., Penard & Penard, 1910, p. 366).

Material: 1/2, 7/1. Shape and texture: broadly oval, moderately glossy. Ground: greyish. Spots: covered with small spots of rather light brown or reddish brown and small purplish under markings. Measurements in mm: average 19.7×15.85 ; minimum 19.1×15.4 ; maximum 20.4×16.4 . Average weight: 181 mg. Breeding time: March-June, one in August.

Notes. Parasitical. The weight is heavy for such small eggs, just like eggs of *Cuculus canorus* L.

Agelaius icterocephalus icterocephalus (L.) (Hellmayr, 1937, p. 177) (*Agelaeus icterocephalus* L., Penard & Penard, 1910, p. 369).

Material: 6/3, 15/2, 25/1. Shape and texture: rather broadly oval, moderately glossy. Ground: bluish, whitish blue. Spots: blackish, rarely blackish brown spots and hair lines, chiefly at the large end, few purplish under markings. Some spots forming penumbra. Measurements in mm: average (50 eggs) 22.4×16.42 ; minimum 19.6×16.2 , 20.2×15 ; maximum 24.9×15.6 , 22.4×17.6 . Average weight: 176 mg. Breeding time: chiefly May and June, 3 in March, 1 in August and 1 in September.

Leistes militaris militaris (L.) (Hellmayr, 1937, p. 197) (*Leistes guianensis* L., Penard & Penard, 1910, p. 370).

Material: 6/4, 17/3, 18/2, 4/1. Shape and texture: oval, somewhat glossy. Ground: light bluish, light greyish blue. Spots: small spots or large blotches of light and darker reddish brown, purplish under markings. The eggs are very variable. Some may be compared with those of the palaeartic Robin, *Erithacus rubecula rubecula* (L.), others with the palaeartic Flycatcher, *Muscicapa striata striata* (Pall.), which also may have the eggs very handsomely and boldly blotched, a few times finely mottled over the whole surface. Varieties: nearly unmarked. Measurements in mm: average (50 eggs) 23.27×17.42 ; minimum 21.5×17.1 , 21.7×16.4 ; maximum 25.4×17.7 , 23.5×18.4 . Average weight: 197 mg. Breeding time: nearly the whole year, none in December, one in January and one in March.

Sturnella magna magna (L.) (Hellmayr, 1937, p. 209) (*Sturnella magna* L., Penard & Penard, 1910, p. 373).

Material: 1/1 (and 1/4, 1/3 from U. S. A.). Shape and texture: broadly oval, moderately glossy. Ground: white. Spots: purplish brown, rather equally distributed over the whole surface, purplish under markings and a few blackish brown spots on some eggs. Measurements in mm: 25.8×19.5 . Weight: 305 mg. Breeding time: not given.

Notes. The eggs from the U.S.A. are larger: 28.1×20.7 ; minimum 26.1×20.5 ; maximum 29.6×20.2 mm; weight: 357 mg.

Gymnomystax mexicanus (L.) (Hellmayr, 1937, p. 157) (*Gymnomystax melanicterus* Vieill., Penard & Penard, 1910, p. 375).

Material: 3/1. Shape and texture: elongatedly oval, rough and glossless. Ground: whitish (bluish white when fresh?). Spots: unmarked. Measurements in mm: 38.7×25.2 , 35.9×25.1 , 35.6×25.6 . Average weight: 700 mg. Breeding time: January, February and July.

Icterus nigrogularis nigrogularis (Hahn) (Hellmayr, 1937, p. 132) (*Icterus xanthornus* Gm., Penard & Penard, 1910, p. 377).

Material: 1/5, 4/4, 2/3, 4/2. Shape and texture: elongatedly oval, moderately glossy. Ground: bluish white, greyish white. Spots: sparingly marked

with bold blotches and hair lines of a blackish colour, chiefly at the large end. Measurements in mm: average 25×16.6 ; minimum 22.9×17 , 23.2×15.4 ; maximum 27.5×17 , 25.6×17.7 . Average weight: 226 mg. Breeding time: February-June, one in August.

Holoquiscalus lugubris lugubris (Swainson), (Hellmayr, 1937, p. 81) (*Quiscalus lugubris* Sw., Penard & Penard, 1910, p. 380).

Material: 2/3, 1/1. Shape and texture: broadly oval, elliptical, rather glossy. Ground: greenish grey. Spots: marked with small and large spots, but especially with hair lines of blackish brown colour and purplish under markings. Measurements in mm: average 24.9×18.2 ; minimum 24.5×18 ; maximum 25.3×18 , 24.6×18.7 . Average weight: 260 mg. Breeding time: April and August.

Notes. The eggs resemble large eggs of the palaeartic Reed-bunting, *Emberiza schoeniclus schoeniclus* (L.).

Oryzoborus crassirostris crassirostris (Gm.) (Hellmayr, 1938, p. 241) (*Oryzoborus crassirostris* Gm., Penard & Penard, 1910, p. 386).

Material: 1/3, 52/2, 16/1. Shape and texture: elongated, but also broadly oval, glossy. Ground: white, yellowish white, greenish white, pinkish white. Spots: small and large spots of a brown colour in different shades, reddish brown, purplish brown and purplish under markings, often forming a zone or cap. Some eggs have a few large black blotches. Measurements in mm: average (50 eggs) 21.83×15.42 ; minimum 19×14.8 , 20.9×13.9 ; maximum 25.2×16.5 , 22.5×17 . Average weight: 147 mg. Breeding time: February-July, one in January and one in August.

Notes. The eggs show a variability as those of the palaeartic Tree-pipit, *Anthus trivialis trivialis* (L.). In size too the eggs show striking differences.

Oryzoborus angolensis torridus (Scopoli) (Hellmayr, 1938, p. 246) (*Oryzoborus torridus* Scop., Penard & Penard, 1910, p. 387).

Material: 1/3, 17/2, 32/1. Shape and texture: broadly oval, nearly gloss-less to moderately glossy. Ground: yellowish white, bluish white, pinkish white. Spots: boldly marked, brown, sienna brown, reddish brown. The sets with pinkish white ground have reddish brown blotches, they are therefore erythristical. Measurements in mm: average 18.16×13.57 ; minimum 16.4×13.3 , 17.2×12.6 ; maximum 20.5×13.7 , 19.8×14.7 . Average weight: 99 mg. Breeding time: March-June, one in January.

Sporophila castaneiventris Cab. (Hellmayr, 1938, p. 225) (*Spermophila castaneiventris* Cab., Penard & Penard, 1910, p. 388).

Material: 4/3, 118/2, 339/1. Shape and texture: broadly oval, spherical, moderately glossy. Ground: white, greyish white, bluish white, a single egg greenish white (not pinkish white). Spots: small and large spots of

light and dark brown, yellowish brown, reddish brown, and often black spots and hair lines. Purplish under markings. The markings often forming a zone or cap. Measurements in mm: average (50 eggs) 15.6×12.48 ; minimum 14.4×12 , 15×11.4 (one very small egg 12.4×12.2); maximum 17.6×13.1 , 15.9×13.2 . Average weight: 72 mg. Breeding time: the whole year, least in November (2), mostly in May and August.

Sporophila minuta minuta (L.) (Hellmayr, 1938, p. 215) (*Spermophila minuta* L., Penard & Penard, 1910, p. 390).

Material: 5/3, 105/2, 357/1. Shape and texture: broadly oval, spherical; moderately glossy. Ground: white, greyish white, pinkish white, a single egg purplish white. Spots: warm light and dark brown, reddish brown, purplish brown, further as those of *Sp. castaneiventris*. Measurements in mm: average (50 eggs) 16.25×12.42 ; minimum 14.2×12 , 15.8×11.5 (one very small egg 13.7×10.7); maximum 18.6×12.8 , 16.1×13.2 . Average weight: 77 mg. Breeding time: the whole year, 1 in January, 1 in December, 2 in November.

Notes. As a rule the eggs are browner and of a warmer tinge than those of *Sp. castaneiventris*, often more or less erythristical.

Sporophila bouvronides (Lesson) (Hellmayr, 1938, p. 211) (*Spermophila ocellata* Scl. & Salv., Penard & Penard, 1910, p. 391).

Material: 1/4, 36/2, 43/1. Shape and texture: oval, moderately glossy. Ground: white, greyish white, bluish white, reddish white, light buff. Spots: light and dark brown, reddish brown, purplish. See further *Sp. castaneiventris*. Measurements in mm: average (50 eggs) 17.35×12.43 ; minimum 15.4×12.6 , 17×10.9 ; maximum 19.7×12.7 , 18.8×13.4 . Average weight: 80 mg. Breeding time: chiefly April-June, 4 in February, 4 in March, 4 in July, one in November.

Notes. As a rule the eggs are more elongated and often greyer than those of the former.

Sporophila americana americana (Gm.) (Hellmayr, 1938, p. 194) (*Spermophila lineata* Gm., Penard & Penard, 1910, p. 393).

Material: 8/3, 124/2, 185/1. Shape and texture: broadly oval, some eggs spherical, moderately glossy. Ground: greyish, greenish grey, bluish grey, sometimes pinkish grey. Spots: rather boldly blotched and spotted, brown, sienna brown, greyish brown, sometimes forming a cap; purplish under markings. Many eggs have black spots. Eggs with a pinkish grey ground have mostly sienna brown and reddish brown blotches and are erythristical. Measurements in mm: average (50 eggs) 18.16×13.57 ; minimum 16.4×13.3 , 17.2×12.6 ; maximum 20.5×13.7 , 19.8×14.7 . Average weight: 99 mg. Breeding time: January-July, one in August.

Volatinia jacarina splendens (Vieill.) (Hellmayr, 1938, p. 251) (*Volatinia jacarini* L., Penard & Penard, 1910, p. 397).

Material: 5/3, 43/2, 31/1. Shape and texture: oval, broadly oval, moderately glossy. Ground: white, bluish white. Spots: small spots and large blotches of reddish and purplish brown, chiefly at the large end and usely forming a zone or cap. Measurements in mm: average (50 eggs) 16.82 × 12.52; minimum 14.7 × 12, 17.1 × 11.7; maximum 18.9 × 12.1, 15.5 × 13.5. Average weight: 77 mg. Breeding time: January-August, 1 in December.

Notes. The eggs are quite different from those of *Sporophila*: the ground is whiter and they are more sparingly reddish brown marked. Many eggs with white ground resemble those of *Parus major major* L. or *P. cristatus cristatus* L.

Emberizoïdes herbicola sphenurus (Vieill.) (Hellmayr, 1938, p. 611) (*Emberizoides macrurus* Gm., Penard & Penard, 1910, p. 403).

Material: 9/2, 2/1. Shape and texture: broadly oval, moderately glossy. Ground: white. Spots: very sparingly marked with small blackish spots at the large end. Measurements in mm: average 22.83 × 16.96; minimum 21.3 × 16.2; maximum 23.6 × 18.1. Average weight: 163 mg. Breeding time: February-May.

Myospiza humeralis humeralis (Bosc) (Hellmayr, 1938, p. 477) (*Ammodramus manimbe* Licht., Penard & Penard, 1910, p. 408).

Material: 1/3, 5/2, 4/1. Shape and texture: variable: broadly and elongatedly oval, spherical; glossy. Ground: white. Spots: unmarked. Measurements in mm: average 20 × 14.9; minimum 18.1 × 14.6, 21.7 × 14.1; maximum 21.7 × 14.1, 21 × 15.6. Average weight: 139 mg. Breeding time: 1 in January, 1 in April, 1 in May, 1 in June and 1 in August, 2 in March.

Saltator maximus maximus (P. L. S. Müller) (Hellmayr, 1938, p. 11) (*Saltator magnus* Gm., Penard & Penard, 1910, p. 460).

Material: 9/2, 8/1. Shape and texture: variable: broadly and elongatedly oval, spherical; glossy. Ground: blue, greenish blue. Spots: zone or cap of black hair lines. Measurements in mm: average 28.5 × 19.6; minimum 24.8 × 19.2, 28 × 18.6; maximum 31.4 × 20.2, 24.9 × 20.7. Average weight: 289 mg. Breeding time: April-May, 2 in February, 1 in June, 1 in August.

Saltator coerulescens olivascens Cab. (Hellmayr, 1938, p. 22) (*Saltator olivascens* Cab., Penard & Penard, 1910, p. 462).

Material: 2/3, 27/2, 9/1. Shape and texture: as in *S. maximus*. Ground: as in *S. maximus*. Spots: as in *S. maximus*. Measurements in mm: average (50 eggs) 26.18 × 19.04; minimum 23.1 × 18.9, 25.2 × 17.5; maximum

28.8 × 19, 25.1 × 20.4. Average weight: 260 mg. Breeding time: January-June, chiefly April.

TANAGRIDAE

Calospiza cayana cayana (L.) (Hellmayr, 1936, p. 157) (*Calliste cayana* L., Penard & Penard, 1910, p. 435).

Material: 1/2, 1/1. Shape and texture: oval, nearly glossless. Ground: greyish and bluish white. Spots: rather boldly marked brown and purplish under markings. Measurements in mm: 20.2 × 14.3, 21 × 14.6. Average weight: 101 mg. Breeding time: July (1).

Calospiza mexicana mexicana (L.) (Hellmayr, 1936, p. 133) (*Calliste flaviventris* Vieill., Penard & Penard, 1910, p. 438).

Material: 3/2, 3/1. Shape and texture: oval, nearly glossless. Ground: greyish and bluish white. Spots: variable: rather boldly marked greyish and purplish brown and purplish under markings. On some eggs the spots are equally distributed over the whole surface, on others they form a cap. Some eggs have blackish spots and hair lines. Measurements in mm: average 20.1 × 14.5; minimum 18.6 × 14; maximum 21.5 × 14.4, 19.8 × 14.9. Average weight: 82 mg. Breeding time: February-April, one in August.

Thraupis episcopus episcopus (L.) (Hellmayr, 1936, p. 205) (*Tanagra episcopus* L., Penard & Penard, 1910, p. 441).

Material: 3/3, 51/2, 34/1. Shape and texture: oval, moderately glossy to nearly glossless. Ground: greyish, light bluish and light greenish, some eggs very light purplish white. Spots: boldly marked brown, sienna brown, and blackish, purplish under markings. Only on very few eggs the markings form a zone. Varieties: one egg has a yellowish grey ground, very sparingly marked light greyish brown, especially at the small end. Measurements in mm: average (50 eggs) 23.64 × 17.21; minimum 21.2 × 17.1, 24.7 × 15.9; maximum 27.3 × 18.2, 24.2 × 19. Average weight: 172 mg. Breeding time: chiefly January-May, 3 in June, 2 in July, 1 in August, 1 in November, 1 in December, 4 in September.

Notes. Many eggs resemble those of *Oryzoborus*. Often there is a considerable difference between the two eggs of one set.

Thraupis palmarum melanopectera (Sclater) (Hellmayr, 1936, p. 226) (*Tanagra palmarum* Max., Penard & Penard, 1910, p. 444).

Material: 2/3, 17/2, 18/1. Shape and texture: as in *T. episcopus*. Ground: as in *T. episcopus*. Spots: as in *T. episcopus*, but as a rule somewhat darker. Measurements in mm: average (30 eggs) 23.75 × 17.11; minimum 21.5 × 16.7, 22.2 × 16.1; maximum 26 × 18.1, 25.8 × 18.6. Average weight: 170 mg. Breeding time: chiefly January and February, 2 in March, 3 in May, 1 in June, 2 in July, 2 in September, 1 in December.

Tachyphonus rufus (Boddaert) (Hellmayr, 1936, p. 322) (*Tachyphonus melaleucus* Sparrm., Penard & Penard, 1910, p. 451).

Material: 1/4, 12/3, 166/2, 115/1. Shape and texture: broadly oval, glossy. Ground: light and darker pinkish, purplish white, white. Spots: rather large dark brown blotches and blackish hair lines with a few under markings. Varieties: some eggs are white, very sparingly marked. Measurements in mm: average (50 eggs) 23.83×17.87 ; minimum 21.1×17.2 , 24.2×16.2 ; maximum 27×18.9 , 24.9×19.4 . Average weight: 229 mg. Breeding time: January-July, 2 in August, 1 in September, 2 in November and 2 in December.

Notes. Many eggs resemble those of the palaeartic Corn-bunting, *Emberiza calandra calandra* L.

Rhamphocelus carbo carbo (Pallas) (Hellmayr, 1936, p. 250) (*Rhamphocelus jacapa* L., Penard & Penard, 1910, p. 446).

Material: 16/3, 243/2, 544/1. Shape and texture: oval, glossy. Ground: greenish blue. Spots: rather sparingly marked at the large end with small and larger spots of a black colour, sometimes forming a penumbra. Varieties: one egg has the ground greyish purplish blue, others have purplish brown or greyish brown spots. Many eggs have black hair lines and one egg a darker blue ring at the small end. Measurements in mm: average 22.47×16.70 ; minimum 19.3×16 , 19.5×14.2 (one dwarf egg: 16.9×11.7); maximum 26.2×17.7 ; 24.9×18.7 . Average weight: 177 mg. Breeding time: January-July, 2 in August, 2 in October, 3 in September and 5 in December.

Notes. The eggs resemble those of the palaeartic Song-trush, *Turdus ericetorum* Turton and show the same varieties.

COEREBIDAE

Cyanerpes cyaneus cyaneus (L.) (Hellmayr, 1935, p. 252) (*Coereba cyanea* L., Penard & Penard, 1910, p. 474).

Material: 3/2. Shape and texture: oval, nearly glossless. Ground: very dark chestnut brown. Spots: nearly quite covered with blackish brown (the eggs appear nearly black). Measurements in mm: average 19.9×14.4 ; minimum 18.9×14.9 , 19.4×13.3 ; maximum 20.6×15 . Average weight: 120 mg. Breeding time: April.

Coereba flaveola minima (Bonaparte) (Hellmayr, 1935, p. 288) (*Certhiola chloropyga* Cab., Penard & Penard, 1910, p. 477).

Material: 1/3, 21/2, 14/1. Shape and texture: variable, glossless. Ground: greyish white, yellowish white. Spots: yellowish brown, rust brown, purplish brown. Sometimes the markings are larger, on other eggs they are small. Often they form a zone or cap. Purplish under markings. Meas-

measurements in mm: average (38 eggs) 16.9×12.4 ; minimum 15×10.9 ; maximum 18.5×12.5 , 15.9×13 . Average weight: 64 mg. Breeding time: March-June.

HIRUNDINIDAE

Progne chalybea chalybea (Gmelin) (Hellmayr, 1935, p. 16) (*Progne chalybea* Gm., Penard & Penard, 1910, p. 497).

Material: 5/3, 3/1. Shape and texture: pointedly oval, slightly glossy. Ground: white. Spots: unmarked. Measurements in mm: average 23.8×16.3 ; minimum 22.2×16.6 , 23.6×15.3 ; maximum 26.3×16.5 , 23.3×17.1 . Average weight: 183 mg. Breeding time: 3 in April, 2 in July.

Phaeoprogna tapera tapera (L.) (Hellmayr, 1935, p. 25) (*Progne tapera* L., Penard & Penard, 1910, p. 499).

Material: 1/4, 1/3, 2/2, 4/1. Shape and texture: pointedly oval, nearly glossless. Ground: white. Spots: unmarked. Measurements in mm: average 22.9×16.2 ; minimum 21.2×16.2 , 24.1×15.6 ; maximum 24.1×16.3 , 22.4×16.6 . Average weight: 175 mg. Breeding time: June, August, September.

MIMIDAE

Mimus gilvus gilvus (Vieillot) (Hellmayr, 1934, p. 313) (*Mimus gilvus* Vieill., Penard & Penard, 1910, p. 514).

Material: 4/4, 27/3, 35/2, 57/1. Shape and texture: oval, moderately glossy. Ground: bluish, greenish blue, greyish blue. Spots: reddish brown, yellowish brown, purplish under markings. Measurements in mm: average (50 eggs) 26.46×19.34 ; minimum 22.9×18.7 , 24.1×17.1 ; maximum 29.9×18.6 , 26.1×20.9 . Average weight: 278 mg. Breeding time: the whole year, chiefly January-March.

Notes. The eggs resemble boldly marked eggs of *Turdus merula merula* L. and *Turdus pilaris* L.

TROGLODYTIDAE

Donacobius atricapillus atricapillus (L.) (Hellmayr, 1934, p. 347) (*Donacobius atricapillus* L., Penard & Penard, 1910, p. 516).

Material: 2/3, 7/2, 3/1. Shape and texture: broadly oval, glossy. Ground: purplish white, yellowish. Spots: nearly quite covered with spots and blotches of reddish or purplish brown. It is remarkable that the eggs with purplish brown spots show more of the ground than those with reddish brown spots. Measurements in mm: average 23.2×17.2 ; minimum 22.1×17 , 23.1×16.1 ; maximum 24.8×18.3 . Average weight: 186 mg. Breeding time: January-July, chiefly May.

Troglodytes musculus clarus (Berlepsch & Hartert) (Hellmayr, 1934, p. 227) (*Troglodytes musculus* Naum., Penard & Penard, 1910, p. 523).

Material: 1/6, 1/5, 26/4, 26/3, 45/2, 51/1. Shape and texture: oval, slightly glossy. Ground: greyish white, purplish white. Spots: small spots of a purplish brown or reddish brown colour with purplish under markings, often forming a zone or cap. Only a few eggs are more boldly marked. Measurements in mm: average (50 eggs) 17.93×13.34 ; minimum 15.7×13.3 , 18.8×12.4 ; maximum 20.2×13.4 , 19×14.7 . Average weight: 103 mg. Breeding time: the whole year, mostly in January and July.

Notes. Many eggs resemble those of the palaeartic Grasshopper-warbler, *Locustella naevia naevia* (Bodd.).

Thryothorus leucotis albipectus Cabanis (Hellmayr, 1934, p. 161) (*Thryophilus albipectus* Cab., Penard & Penard, 1910, p. 527).

Material: 2/3, 10/2, 7/1. Shape and texture: oval, slightly glossy. Ground: white, greyish white, bluish white. Spots: rather sparingly marked, yellowish brown, rustbrown, chiefly at the large end, in some cases forming a cap; purplish under markings. Measurements in mm: average 20.6×14.8 ; minimum 19×14.4 , 20×13.9 ; maximum 22.7×14.1 , 21.4×15.7 . Average weight: 120 mg (rather light!). Breeding time: January-September.

VIREONIDAE

Hylophilus pectoralis Sclater (Hellmayr, 1935, p. 165) (*Hylophilus sclateri* Salv. & Godm., Penard & Penard, 1910, p. 535).

Material: 4/2, 3/1. Shape and texture: oval, nearly glossless. Ground: white. Spots: small blackish spots at the large end. Measurements in mm: average 18.1×13.3 ; minimum 17×12.5 ; maximum 19×13.3 , 18.7×13.8 . Average weight: 89 mg. Breeding time: January-June.

TURDIDAE

Turdus nudigenus nudigenus Lafresnaye (Hellmayr, 1934, p. 379) (*Turdus gymnophthalmus* Cab., Penard & Penard, 1910, p. 542).

Material: 8/4, 47/3, 47/2, 65/1. Shape and texture: as a rule rather broadly oval, moderately glossy. Ground: greenish blue, blue, whitish blue, a single egg with a purplish hue. Spots: handsomely and boldly marked brown, red brown, chestnut brown, sometimes forming a cap. Measurements in mm: average (50 eggs) 27.78×20.54 ; minimum 25.6×20.1 , 27.3×18.9 ; maximum 31.1×21.2 , 24.8×22 (an abnormally large egg: 34.8×22). Average weight: 304 mg. Breeding time: February-June, 3 in January, 2 in July.

Notes. As a rule the eggs are more boldly marked than those of the palaeartic Thrushes.

Turdus leucomelas ehippialis Sclater (Hellmayr, 1934, p. 401) (*Turdus albiventer* Spix, Penard & Penard, 1910, p. 545).

Material: 2/4, 23/3, 22/2, 14/1. Shape and texture: as a rule rather broadly oval, moderately glossy. Ground: bluish green, whitish blue, greyish. As a rule the ground is less blue than in those of *T. nudigenus*. Spots: boldly marked brown and redbrown, but not so handsome as in *T. nudigenus*. Measurements in mm: average (50 eggs) 27.87 × 19.80; minimum 23.5 × 19.1, 24.8 × 18.3; maximum 32.2 × 20.5, 28 × 21.1. Average weight: 299 mg. Breeding time: January-June.

Notes. The eggs resemble those of the palaeartic *Turdus torquatus torquatus* L.

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