Five bird species new to Colombia.—In the course of 8 months studying niche relationships of kingfishers near Leticia, Amazonas, Colombia, I recorded the following five species previously unknown from Colombia. All were found on the Isla de Santa Sofía II, an island in the Amazon River about 35 km northwest of Leticia, and collected there unless otherwise indicated.

WHITE-RUMPED SANDPIPER (*Calidris fuscicollis*).—A good series of photographs of a single bird were obtained on 24 October 1974. The diagnostic white rump was seen clearly when the bird was flushed. Identification of the photos was verified by Frank A. Pitelka, who has over 20 years of field experience with this species at Barrow, Alaska, and by J. P. Myers, who has studied this species intensively on its wintering grounds in Argentina. This bird gave the thin, high-pitched, metallic "chip" note I learned to associate with it from my own field experience at Barrow, which is different from the calls of other *Calidris* species. This species has been recorded as a migrant or winter resident widely east of the Andes but apparently not from Colombia (Meyer de Schauensee 1964, The birds of Colombia; 1966, The species of birds of South America and their distribution; 1970, A guide to the birds of South America, Wynnewood, Pennsylvania, Livingston Publ. Co.).

PLAIN-BREASTED PICULET (*Picumnus castelnau*).—A female (Museum of Vertebrate Zoology [MVZ] No. 164036; 11.4 g) feeding a fledgling was collected on 21 June 1975. This species is an uncommon breeding resident on the island in swampy, seasonally flooded forest and was noted virtually every day throughout my 8 months there. Previously known only from a limited area in eastern Ecuador and eastern Peru (Meyer de Schauensee 1966, 1970), the present record is the easternmost to date.

DULLED-CAPPED ATTILA (*Attila bolivianus*).—A male (MVZ 163857) was collected on 12 October 1974 (specimen prepared by Sadie L. Brown). This species is a fairly common resident in forests on the island and was recorded daily. It is also found on the adjacent mainland in seasonally and permanently flooded forest. I photographed a nest with 3 eggs in the base of an epiphyte cluster 1.3 m above the water on a small stream, Quebrada Tucuchira, on the Colombian bank of the Amazon on 5 June 1975. Basically a southern Amazonia species (Meyer de Schauensee 1966, 1970), the present record may be the first north of the Amazon River. Melvin A. Traylor confirmed the identification and assigned the specimen to the subspecies *natterei*.

SPOTTED TODY-FLYCATCHER (*Todirostrum maculatum*).—A male (specimen given to the systematic collections of El Instituto de Desarallo de los Recursos Naturales Renovables, Bogota; 6.9 g) was collected on 28 May 1975, and another male (MVZ 164051; 6.4 g) was obtained 3 June 1975. This species is an uncommon resident in low, wet second growth all along the Colombian bank of the Amazon. It has been recorded from both eastern Amazonian Ecuador and Peru and western Amazonian Brazil (Meyer de Schauensee 1966, 1970), and so its presence in Amazonian Colombia was to be expected.

BAND-TAILED OROPENDOLA (*Psarocolius latirostris*).—This species was seen once on Isle de Santa Sofía II (16 August 1974) and on 14 occasions between 27 October 1974 and 30 July 1975, usually in groups of 10–30 birds, in seasonally and permanently flooded forest along Quebrada Tucuchira on the Colombian mainland across the Amazon River from that island. A male (MVZ 164059; 114 g) was collected at Quebrada Tucuchira on 16 June 1975 and a female (MVZ 164060; 81 g) on 17 June 1975. Previously known only from a few localities in eastern Ecuador, northeastern Peru, and western Brazil (Meyer de Schauensee 1966, 1970), these Colombian specimens represent the northeasternmost to date.

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Relationships between egg pigmentation and hatching sequence in the Herring Gull.— The shape and distribution of superficial markings have been correlated with egg position in the clutch sequence in the Laughing Gull, *Larus atricilla*, and Common Tern, *Sterna hirundo* (Preston 1957, Auk 74: 28). This paper adds the Herring Gull, *Larus argentatus*, as an additional member of the family Laridae demonstrating these relationships.

Data were collected in 1973 on 150 three-egg clutches and 20 two-egg clutches on Goose Island, Mackinac County, Michigan. Individual eggs were marked with a ball-point pen and periodically re-marked as the ink faded. The shape of the superficial markings (spots, splotches, streaks) on each egg and the amount of such markings relative to the other eggs in the same clutch was recorded. The subjectiveness of such observations was kept to a minimum by quantifying the data. For example, the amount of streaking was defined simply as the number of streaks. The presence or absence of a crown (a circle or

TABLE 1

RELATION OF EGG MARKINGS TO HATCHING SEQUENCE IN TWO- AND THREE-EGG CLUTCHES

Egg markings	Hatching sequence			Total
	1st	2nd	3rd	
Three-egg clutches				
Spotted	145	135	35	315
Streaked	5	15	115	135
Total	150	150	150	450
Two-egg clutches				
Spotted	17	11	—	28
Streaked	3	9	—	12
Total	20	20	—	40

wreath of markings at the large end of an egg) was recorded for each egg. If a crown was present it was categorized as faint (less than obvious but a definite tendency towards a crown) or definite (immediately obvious). The matrix or ground color (ranging from dark brown, brown, tan, gray, drab green to light blue) was recorded for each egg. The color data were analyzed in terms of relative differences and not according to specific colors so that lack of precision from subjectiveness of color selection was unimportant. The hatching date for each egg was determined and recorded. Only clutches in which the complete hatching order was known were analyzed using Chi-square tests (contingency tables).

In three-egg clutches that contained one streaked egg and two spotted eggs the streaked egg was always the last to hatch. In nests that contained two streaked eggs and one spotted egg the egg with the greater number of streaks was always the last to hatch, the egg with the fewer streaks was always second, and the spotted egg was always first. Five nests contained three streaked eggs. In three cases the egg with the fewest streaks was the first to hatch, the egg with the most streaking was last, and the second egg was intermediate in its amount of streaking. The amount of streaking was defined as the number of streaks, but possibly had the length of the streaks also been considered, progressive streaking would have been found in the two cases where the first and third and first and second eggs had the same number of streaks. Table 1 shows that the distribution of spotted and streaked eggs was significantly different for the three positions in the hatching sequence, with the greatest amount of streaking occurring on the third egg ($P < 0.005$). This agreed with Preston's (ibid.) findings that "in the Laughing Gull, the individual spots tend to be equiaxed in the first egg, but elongated into sausage-shaped marks and even 'scribbles' in the third egg." He further noted that although the second egg also differed from the first this difference was not so great as between the second and third eggs.

In six two-egg clutches that contained one spotted egg and one egg with streaks, the streaked egg was always the last to hatch. In three clutches that contained two streaked eggs the egg with the greater number of streaks was always the last to hatch. Although the sample was too small for a reliable statistical analysis it did suggest that a significant difference ($P = 0.04$) existed between the markings of first and second eggs, with a greater tendency for streaks to occur on the second egg.

TABLE 2

RELATION OF CROWNING TO HATCHING SEQUENCE IN TWO- AND THREE-EGG CLUTCHES

Crowning	Hatching sequence			Total
	1st	2nd	3rd	
Three-egg clutches				
No crown	119	110	59	288
Faint crown	22	26	43	91
Definite crown	7	12	46	65
Total	148	148	148	444
Two-egg clutches				
No crown	17	12	—	29
Crown present	3	8	—	11
Total	20	20	—	40

Slightly more than one-third (35%) of the eggs in three-egg clutches had a crown (Table 2), which was progressively more common from the first through the third egg, and showed a significant relationship to the egg's position in the hatching sequence ($P < 0.005$). When a definite crown occurred this crown occurred 6.6 times more frequently on the third egg than on the first and 3.8 times more frequently on the third egg than on the second. A definite crown occurred 1.7 times more frequently on the second egg than on the first. This agreed with Preston's (ibid.) findings with the Laughing Gull and Common Tern.

In two-egg clutches a crown (faint or definite) occurred 2.7 times more frequently on the second egg than on the first (Table 2), but a Chi-square test showed no significant relationship between the presence of a crown and the hatching sequence in two-egg clutches. Preston (ibid.) also found no difference between the first and second eggs of the Common Tern.

Over one-quarter (28%) of the three-egg clutches contained one differently colored egg with two eggs of the same color. The one egg that differed in color was the third to hatch 79% of the time and the first to hatch 21% of the time. The second egg was never found to be the differently colored egg of a clutch. Assuming there was an equal probability that each position in the hatching sequence might be held by the differently colored egg, a Chi-square analysis was made ($P < 0.005$), showing that when a three-egg clutch had two eggs of one color and one egg of another color, the differently colored egg was most likely to be the third egg.—MICHAEL L. CHAMBERLIN, *Interlochen Arts Academy, Interlochen, Michigan 49643.* Accepted 14 Nov. 75.

Sizes of snails eaten by Snail Kites and Limpkins in a Costa Rican marsh.—Both the Limpkin (*Aramus guarauna*) and the Snail Kite (*Rostrhamus sociabilis*) feed on freshwater molluscs. The Limpkin may prey upon a variety of molluscs (Snyder and Snyder 1969, Living Bird 8: 177), but the Snail Kite is known to feed almost exclusively on prosobranch snails of the genus *Pomacea* (Sykes and Kale 1974, Auk 91: 818). This paper reports a difference in the distributions of shell sizes of *Pomacea* consumed by kites and Limpkins at a marsh where both bird species appear to feed exclusively on *Pomacea*.

The Limpkin and the kite employ different strategies in capturing snails and in extracting them from their shells. The Limpkin wades about in the shallows, probing the bottom until its bill contacts a snail, which it then carries to a suitable elevated, flat spot on the marsh, hammers out the operculum with a sharp blow of the bill, and extracts the meat. The bill makes a characteristic notch in the columellar edge of the operculum and frequently makes a hole in the dorsal side of the shell opposite the point of entry. Other foraging techniques have been reported for the Limpkin (Snyder and Snyder op. cit.), but were not observed at the study site. The kite, on the other hand, searches visually while flying over open water. It can forage over water that is too deep for the Limpkin to wade in. The kite takes snails that are at or near the surface, carries its prey to a perch and then extracts the meat with a quick stroke of the beak. Generally the kite leaves no mark on the discarded shell or operculum (Snyder and Snyder op. cit.).

Empty snail shells accumulate at the habitual feeding sites of individual kites and Limpkins. One can determine which predator species was responsible for the formation of a particular pile of shells by the presence or absence of perforations in some of the shells.

Fieldwork was done in January 1975 at the Organization for Tropical Studies field station at Palo Verde in Guanacaste, Costa Rica. The study was conducted on the large freshwater marsh south of the field station. The marsh consisted of extensive patches of rushes, grasses, water hyacinth, or open water. *Parkinsonia* trees were scattered throughout the shallower wetlands. *Pomacea* of unknown species were abundant, as evidenced by their empty shells, which formed an integral part of the sediments. The ubiquity of piles of snail shells suggested that Limpkins and kites were the major predators of *Pomacea*. Most of these piles seemed to have been made by Limpkins.

I collected samples of shells from discrete piles. As the kites I saw invariably perched in *Parkinsonia* when feeding, only piles found under these trees and having few or no perforated shells were assumed to be of kite origin. Piles located under *Parkinsonia* trees and having a noticeable frequency of perforated shells were rejected to avoid samples of mixed origin. Piles made by Limpkins were sampled from various parts of the marsh. A 2- to 4-liter sample of shells was taken from the center of each pile used. I sampled 7 piles accumulated by kites and 17 attributed to Limpkins. The greatest length of each shell was measured in millimeters using a rectangular frame and rule (see Fig. 1, inset). In all I measured 1373 shells (320 kite, 1053 Limpkin).

The mean length for all Limpkin shells combined is 34.77 mm, with a standard deviation of 5.45 mm. Shells from kite piles averaged 43.18 mm, with a standard deviation of 6.03 mm. The difference between means, using all piles combined for the same bird species, is significant ($P < 0.01$) by the approximate