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MEASUREMENTS.—Four adult males:—Length (skins), 104–111 mm. (107); wing, 49–52 (50); tail, 43–44 (43.2); exposed culmen, 12–13 (12.5); tarsus, 16.5–17 (16.7); middle toe, 11.5–12.4 (12.1).

Three adult females:—Length (skins), 103–105 mm. (104); wing, 50 (50); tail, 41–42 (41.3); exposed culmen, 11–13 (12); tarsus, 16–17 (16.5); middle toe, 11–12 (11.3).

GEOGRAPHIC DISTRIBUTION.—The Huachuca and Santa Rita mountains of Arizona and southward for an undetermined distance.

REMARKS.—I take this opportunity of inscribing this new wren to Dr. Charles T. Vorhies, whose work on the zoology of Arizona is well known.

In conclusion I wish to express my thanks to the Museum of Comparative Zoölogy, Cambridge, and the U. S. National Museum, Washington, for the generous loan of specimens used for comparison in this study.

The Bird Research Foundation
Cleveland, Ohio

A REVIEW OF THE FORMS OF THE BROWN PELICAN

BY ALEXANDER WETMORE

UNDERSTANDING of the races to be recognized among the Brown Pelicans has been developing gradually since the tenth edition of Linnaeus in 1758, where all pelicans of the entire world, white or brown, were listed under the name *Pelecanus onocrotalus*. In 1766 Linnaeus formally separated the Brown Pelican as distinct under the name *occidentalis*, basing this on Sloane and Ray. Gmelin in 1789 included the Peruvian Pelican, known now under the name *thagus* of Molina, and Ridgway in 1884 described the bird of the west coast of the United States under the name *californicus*. Other early names were used for these birds but their application was confused and uncertain.

When W. L. Abbott began sending birds from Hispaniola more than 25 years ago, Charles W. Richmond and I recognized that the Brown Pelicans of that island were smaller than those of the southeastern United States and therefore different, and prepared some notes on the subject, but for various reasons these were never published. Peters ('Check-list of Birds of the World,' 1: 81, 1931) made this separation, listing in all four races, *viz.*, *occidentalis*, *carolinensis*, *californicus* and *thagus*. Murphy ('Oceanic Birds of South America,' 2: 808–810, 1936) revised the ranges of these in more detail, discussed the characters, and indicated that the Galápagos population, which had earlier been attributed to *californicus* and to *occidentalis*, was probably distinct.

In the studies of this subject that I now present I have examined and measured the Brown Pelicans in the National Museum, the Academy of Natural Sciences, the American Museum of Natural History, and the Museum of Comparative Zoölogy. Dr. A. van Rossem has given me measurements and notes on the specimens in the Dickey collection and in the Los Angeles Museum, F. Carlos Lehmann V., those in the Instituto de Ciencias Naturales in Bogotá, and Robert T. Moore, those in the Moore collection. I have to thank Mrs. Hermon Dunlap Smith for measuring the considerable series in the Chicago Natural History Museum. In addition to those that have been measured I have examined many more in which the sex was not marked and which therefore were not used in the measurement tables.

While the data thus available are extensive they are not final as regards many points in distribution, particularly for the Caribbean area and for the west coast of Central America and México. And while I have included the huge Peruvian Pelican as a race of *occidentalis*, I am not wholly certain that it should not be called a distinct species.

In the following account, the localities indicate those from which specimens were seen, no attempt being made to list the breeding colonies.

PELECANUS OCCIDENTALIS OCCIDENTALIS Linnaeus

Pelecanus occidentalis LINNAEUS, Syst. Nat., ed. 12, 1: 215, 1766 (Jamaica).

Smallest of the races; generally similar in color to *carolinensis*, but in breeding dress averaging darker on the under surface; in non-breeding stage usually, but not always, darker above.

Males (16 specimens): wing, 461–496 mm. (478); tail, 114–130 (126); culmen, 255–306 (288); tarsus, 68–78 (71.2).

Females (14 specimens); wing, 448–486 mm. (462); tail, 114–128 (124, average of 12); culmen, 251–286 (261); tarsus, 58–77.2 (67.1).

Breeding in Jamaica, Haiti (Grande Cayemite Island, Gonave Island, Gran Boucan), the Dominican Republic (Caño Hondo and Cayo Levantado in Samaná Bay), and Puerto Rico, (Aguadilla, Añasco, Mayagüez, Mameyes), and through the Lesser Antilles to St. Eustatius, Antigua and Guadeloupe, probably farther to the Grenadines (Catholic Island); Aruba, probably Curaçao, and Bonaire; apparently wandering to the Bahamas (Rolle Cay, Great Inagua Island), the Caribbean coast of Mexico (Contoy Island and Puerto Morelos, Quintana Roo), and Florida (Pensacola).

The breeding range of the typical form in general is in the central

and southern sections of the West Indies. I have seen only one specimen from Jamaica, a male in breeding dress, without date or definite locality, in the American Museum of Natural History, one of the smallest specimens examined. Many years ago I recognized the small size of the bird of Hispaniola from bones found in archeological sites by W. L. Abbott, with the result that we received several skins from that island. Beyond Puerto Rico I have actually seen specimens from St. Eustatius, Antigua and Guadeloupe, with one of somewhat questionable determination, as it is intermediate in size, from Catholic Rock, near Catholic Island, in the Grenadines. The status of the breeding pelicans from Guadeloupe southward remains to be definitely settled, since I have handled birds some of which are assigned to this form and some to *carolinensis* from Guadeloupe and the Grenadines. Three from Aruba are typical of this small race, being two males taken June 25, 1892, one in breeding dress and one with white head and neck, and a female, shot April 28, 1908, which is immature. These seem sufficient to establish this area as an outlying colony of true *occidentalis*. From present knowledge this seems to be an isolated group located far to the south of the main body of its relatives. It is probable that the same form inhabits Curaçao, as the pelicans that I have seen there in life have seemed small, and also Bonaire.

These birds appear to wander to some extent when not nesting. There is a specimen in the U. S. National Museum taken in March, 1885, at Pensacola, Florida, an adult in breeding dress, that is typical of *occidentalis* in color of the under surface and in size (wing 488 mm., culmen 257 mm.), that serves to add this race to the A. O. U. Checklist. The sex is not marked but it is probable that it is a male. I have seen one from Rolle Cay, Great Inagua Island, in the Bahamas, taken June 4, 1879, and several from the coast of Quintana Roo at Puerto Morelos and Contoy Island. At the latter locality birds typical of this race and of *carolinensis* were taken at the same time.

PELECANUS OCCIDENTALIS CAROLINENSIS Gmelin

Pelecanus carolinensis GMELIN, 'Syst. Nat.,' 1 (pt. 2): 571, 1789 (Charleston Harbor, South Carolina).

Larger than *occidentalis*, in breeding plumage averaging lighter on the under surface, and in adult non-breeding dress being usually slightly lighter gray above, though in this character there is considerable variation, and some are not separable; smaller than *californicus*, in breeding dress with the hindneck lighter, more reddish brown.

Males (28 specimens from the United States): wing, 500-550 mm. (526); tail, 123-158 (136); culmen, 280-348 (319); tarsus, 70-89.4 (80.5).

Females (23 specimens from the United States): wing, 483–528 mm. (501); tail, 122–153 (136); culmen, 280–333 (294); tarsus, 68–83.7.

Coasts of the southeastern United States, breeding from South Carolina to Texas, north to North Carolina after the nesting season, casually farther; also ranging along the coasts of Cuba (specimens seen from Cayo Grande de Moa, Oriente, Cachiboca Cay, in the Cayos de Doce Leguas, Camagüey, and Cayos de la Leña, Pinar del Río), the Bahamas (Andros Island), Navassa Island, Dominican Republic (Samaná Bay, one specimen November 16, 1907), Guadeloupe (several), St. Vincent (Kingston, type of *P. relictus* Thayer), Grenadines (Catholic Rock, near Catholic Island), Trinidad (Soldado Rock, Port of Spain), wandering south to northern Brazil; also Venezuela (Cumaná, recorded by Murphy, *Oceanic Birds of South America*, 2: 808, 1936), Caribbean coast of Colombia (Pozos Colorados near Gaira, Santa Marta, Puerto Colombia), Canal Zone (Brujas Point), and México (Contoy Island, Quintana Roo); on the Pacific coast of Central America from Panamá (Isla El Rey and San José, Pearl Islands, and Panamá Bay), Costa Rica (Punta Piedra, Guanacaste), El Salvador (Puerto del Triunfo), and Guatemala (San José), probably to southern México.

The actual breeding range of this widely distributed subspecies outside of the United States will have to be plotted through careful examination of birds in their scattered nesting colonies. I have seen only two skins of the Brown Pelican from the Bahama Islands, one from Andros Island which is *carolinensis*, and one from the Inagua group which is *occidentalis*, so that possibly the larger bird is the one of the northern islands while the smaller one occurs in the south. Four specimens from Cuba, from both north and south coasts, are all *carolinensis*, as is one from Navassa Island. Two of the adult Cuban birds in breeding dress are darker below like *occidentalis* but are large like *carolinensis*. One female from Samaná Bay in the Dominican Republic in the American Museum collection (No. 729,035) taken, November 16, 1907, has the wing 506 mm., and the culmen 307 mm. and is apparently a stray of *carolinensis*, as four others from this same area are all typical *occidentalis* in size.

This large race ranges around the western shore of the Gulf of Mexico and the Caribbean Sea, and then follows the northern coast of South America across to Trinidad. Comparatively few birds with complete data are at hand from the southern Lesser Antilles, but I have examined several that are of this race from Guadeloupe. The type of *Pelecanus relictus* described by G. H. Thayer¹ from St. Vincent,

¹ *Pelecanus relictus* G. H. Thayer, *The Sentry*, Kingstown, St. Vincent, W. I., January 9, 1925 (Kingstown Harbor, St. Vincent).

now in the American Museum of Natural History, is an adult male of *carolinensis* in non-breeding dress, having the wing 523 mm., and the culmen 312 mm. And I have seen two others from Mustique and one from Catholic Rock, near Catholic Island, in the Grenadines. Some of these Lesser Antillean specimens are small, and there seems to be overlap here with birds that in size refer to *occidentalis*. Whether this is due to wandering, or whether this is an area of intergradation between the two forms, remains to be established. I have not examined specimens from the northeastern coast of South America south of Trinidad, where birds are recorded as far south as the Amazon.

It is most interesting that these great birds also range to the Pacific coast in Panamá, and extend north along these shores to Guatemala and probably to southern México. The line of approach or contact between *carolinensis* and *californicus* remains to be determined by specimens taken in breeding plumage at the nesting colonies. Some specimens from the Pearl Islands in the Gulf of Panamá show approach to the new form described beyond from Colombia and Ecuador, but are nearer *carolinensis*. So far as I can determine birds from the Atlantic and Pacific areas here allocated to *carolinensis* are identical.

PELECANUS OCCIDENTALIS CALIFORNICUS Ridgway.

Pelecanus (fuscus?) californicus RIDGWAY, in Baird, Brewer and Ridgway, 'Water Birds of North America,' 2: 143, 1884 (La Paz, Baja California).

Averaging larger than *carolinensis*; in breeding dress the brown of the hindneck much darker, in some specimens almost black.

Males (34 specimens): wing, 520–585 mm. (551); tail, 131–198 (154); culmen, 316–372 (347); tarsus, 76–89.3 (84.5).

Females (23 specimens): wing, 483–569 mm. (519); tail, 130–200 (151); culmen, 298–330 (312); tarsus, 70–82.6 (77.6).

From Monterey County, California, south around the peninsula of Baja California, ranging to the coast of Sonora (Guaymas), the Tres Marias Islands, and probably farther south; in winter north to British Columbia; recorded as a straggler at Guadalupe Island.

While large size marks this form as an average character to separate it from *carolinensis*, smaller individuals can be distinguished certainly under present information only by the color of the hindneck in breeding plumage. The southern extension of the range beyond Baja California and the Tres Marias Islands is, therefore, at present uncertain. An immature male in the National Museum from Acapulco, Guerrero, may be *californicus*, but this is not certain as the measurements (wing 520, culmen 328 mm.) are intermediate. Possibly the sex is wrongly marked.

PELECANUS OCCIDENTALIS URINATOR subsp. nov.

CHARACTERS.—Similar to *Pelecanus occidentalis californicus* Ridgway, but in breeding plumage with hindneck lighter, more chestnut brown as in *carolinensis* and *occidentalis*; in breeding and non-breeding dress averaging darker above, and usually darker below, than *californicus*.

DESCRIPTION.—Type, U. S. National Museum No. 376,743, male adult, in breeding plumage, taken at Hood Island, Galápagos Islands, June 23, 1906, by E. W. Gifford (original number 2953). Feathers of head and a narrow line extending down the side of the pouch to expand into a pointed area on the side of the foreneck white, with a wash of colonial buff on forehead, and to a less degree on crown and sides of head; hindneck to base, with a ring around foreneck extending to the base of the pouch, cameo brown to chocolate, with a slightly darker border of bone brown beside the white line that extends along the pouch, this darker wash broadening distally and extending as a wider area below the expanded end of the white; feathers of back, rump, upper tail coverts and lesser wing coverts dull white centrally along the shaft, edged broadly with dark mouse gray; scapulars smoke gray, with a whitish wash, edged with dark and blackish mouse gray, the dark edgings being relatively wider and more prominent on the smaller feathers; middle wing coverts similar but with dark edgings reduced or absent; greater wing coverts pale smoke gray with faint edgings of deep mouse gray; primaries blackish with shafts light cream color; secondaries and rectrices deep mouse gray with a wash of whitish on outer webs, a white spot with the distal feathers tipped and washed with massicot yellow at the base of the foreneck; sides of extreme upper breast dark mouse gray, with prominent shaft lines of white producing a markedly streaked appearance, the streaks becoming smaller or disappearing toward the median line; rest of under surface mouse gray to deep mouse gray with indistinct shaft lines of dull white, which are wider and more prominent in the center of the lower breast and the upper abdomen; under tail coverts with extensive central areas of whitish; under wing coverts deep mouse gray with irregular central shaft marks of dull white.

MEASUREMENTS.—Males (9 specimens): wing, 552–570 mm. (561); tail, 130–148 (140); culmen, 340–379 (361); tarsus, 81.8–89.4 (84.5).

Females (5 specimens): wing, 516–546 mm. (527); tail, 129–145 (137); culmen, 307–372 (329); tarsus, 77–85.3 (80.4).

Type, male: wing, 559 mm.; tail, 147; culmen, 340; tarsus, 84.6.

RANGE.—The Galápagos Islands.

REMARKS.—For many years the Brown Pelicans of the Galápagos Islands were listed as *P. o. californicus*, though it was recognized that the colony here was isolated, being cut off from any contact with *californicus* along the entire western coast of Central America by the intervention of the smaller *carolinensis*. Swarth recognized the color differences which led him to assign them to *occidentalis*, a name that at that time included the birds of the southeastern United States. The large size of the Galápagos bird is the main point of resemblance between it and *californicus* as the color differences are easily seen.

The series examined comes from Chatham, Narborough, Albemarle, Indefatigable and Hood Islands. The specimen used as the type was obtained from the California Academy of Sciences, through the kindness of Dr. Richard C. Miller and Dr. Robert T. Orr.

PELECANUS OCCIDENTALIS MURPHYI subsp. nov.

CHARACTERS.—Similar in size to *Pelecanus occidentalis carolinensis*, but in color darker above, and more extensively streaked with lighter below; in breeding dress with hindneck darker; separated from *Pelecanus occidentalis californicus* Ridgway by smaller size, more extensive light markings below, and darker dorsal color; similar in dorsal color to *Pelecanus occidentalis urinator* but smaller, and with more extensive light markings below.

DESCRIPTION.—Type, American Museum of Natural History No. 206,988, male adult, in breeding plumage, from Pelado Island, Santa Elena Bay, Ecuador, taken February 14, 1925, by Robert Cushman Murphy and Van Campen Heilner; original number 5010, marked as having testes much enlarged ("t. m. e" on label). Feathers of crown, sides of head, a narrow border on sides of neck along the pouch immediately below head, and a small spot in center where the foreneck joins the breast Naples yellow externally and white basally; line along sides of neck, expanding behind angle of jaw, and extending down to cover base of foreneck (except for Naples yellow spot indicated above) white; slightly elongated nuchal crest Naples yellow anteriorly and white on upper hindneck, with a few scattered white feathers down the median line on the hindneck for three fourths of its length; hindneck, except as indicated, bone brown, with an indefinite median line of Natal brown, the feathers on the lower part of the hindneck Natal brown basally; feathers of back and rump blackish slate, with a broad central streak of white, these light streaks very broad on the rump and upper tail coverts; scapulars partly hair brown and partly fuscous, many of them with a wash of hoary white that disappears in part with wear so that it is not evenly spread; anterior edge of wing and smaller

lesser wing coverts sooty black to fuscous black, lined with white anteriorly, the longer ones and those on the inner half of the wing mixed hair brown, fuscous and fuscous black; middle wing coverts hair brown and fuscous black; alula dull black; primaries fuscous black, with shafts ivory white basally, changing distally to dull black; secondaries sooty black, with a wash of grayish white on outer webs; under surface mouse gray to deep mouse gray, the dark color being especially prominent on the upper breast, with narrow median shaft lines of dull white, these being more prominent on lower breast and abdomen; sides, flanks and under wing coverts fuscous black with wide shaft lines of white; rectrices hair brown to mouse gray, the less worn feathers with a wash of whitish on outer webs.

MEASUREMENTS.—Males (11 specimens): wing, 505–526 mm. (513); tail, 127–162 (135); culmen, 310–346 (328); tarsus, 69–81.2 (77.4).

Females (8 specimens): wing, 478–494 mm. (485); tail, 123–175 (139); culmen, 289–297 (293); tarsus, 61–75.7 (70.7).

Type, male: wing, 513 mm.; tail, 126; culmen, 340; tarsus 78.4.

RANGE.—Pacific coast of Colombia (Octavia Rocks, Bahía de Málaga, Gorgonilla Island) and Ecuador (Vaquería, Isla Silva Sur, and Río San Antonio, Prov. de Los Ríos, Isla de Jambelí, Prov. de Oro, Santa Elena, Punta Salinas, and Pelado Island, Bahía de Santa Elena, Prov. de Guayas); ranging south to Talara, Perú.

REMARKS.—Previously these birds have been placed with *carolinensis* because of their agreement in size with that form, but the color differences are definite and distinctive. In breeding dress the hindneck is darker, much as in *californicus*. Birds from the Pacific coast of Colombia begin to grade over toward *carolinensis*, but appear nearer to *murphyi*. Thus, a female from Gorgonilla Island is like *carolinensis* below but is darker above, a female from farther north at Bahía de Málaga is identical with specimens from Ecuador, and a male from Octavia Rocks a short distance south of the boundary between Panamá and Colombia is like the specimens from Gorgonilla Island. It may be remarked that birds from the Pearl Islands in the Gulf of Panamá are also slightly intermediate but are to be placed with *carolinensis*.

The Ecuadorian and Peruvian birds seem to resemble *californicus* closely in the very dark color of the hindneck in breeding dress, but differ from that form in darker dorsal color and more extensive white markings below, as well as in average smaller size. Occasional specimens of *carolinensis* from the southeastern United States are equally dark on the hindneck, however. The dark hindneck shows in some specimens from the Pearl Islands, Panamá, being further indication

that birds from that area are intermediate, though near *carolinensis*. In color, *murphyi* shows some approach to *thagus* but in the series examined I have not seen any that might be considered intermediate in size, nor do any display the head caruncles characteristic of adult *thagus*.

This form is named for Dr. Robert Cushman Murphy in recognition of his extended studies of this interesting group of birds.

PELECANUS OCCIDENTALIS THAGUS Molina

Pelecanus Thagus MOLINA, 'Sagg. Stor. Nat. Chili': 240, 1782 (Chile).

Largest of all the forms; in breeding dress much lighter below, the feathers of the under surface of the body being finely streaked with white along the shaft; occipital crest more prominently developed; hindneck dark brown as in *californicus*; a growth of caruncles on the bare skin between the base of the culmen and the eye; pouch and bill more brilliantly colored in the breeding season; immature darker on the head and dorsal surface than the corresponding age in *carolinensis*.

RANGE.—From the northern end of the Humboldt Current, coast of Perú (specimens seen from Cabo Blanco, Lagarto Head, Chincha Islands, Ancon, Lobos de Tierra Island) southward to central Chile (specimens seen from Papudo, Concón and Corral), casually farther to Ancud, Chiloé Island, and even to Picton Island at the eastern end of Beagle Channel, Tierra del Fuego.

Males (6 specimens): wing, 575–625 mm. (606); tail, 140–177 (152); culmen, 340–425 (397); tarsus, 95–112.7 (105.9).

Females (14 specimens): wing, 520–606 mm. (576); tail, 135–174 (146); culmen, 332–390 (354); tarsus, 87–107 (100).

REMARKS.—The fully adult bird of both sexes has the bare skin of the upper margin of the loreal region and the adjacent sides of the frontal area from above the anterior (inner) canthus of the eye to the base of the bill, immediately behind the groove between the culmen and the sides of the bill, covered with rough, narrow, irregularly formed, closely placed caruncles that cover an elongated elliptical area. In one male (Amer. Mus. Nat. Hist. 729,060) this measures 39 mm. long by 13 mm. broad, with the free points elevated 4 to 5 mm. Smaller, irregularly placed horny papillae are found on the semicircular base of the culmen, and also around the base of the lower mandible below the gape. This peculiar development is most prominent in males, but is found to a lesser degree in females. It begins to appear as the young bird changes from the grayish-necked immature dress to the white neck of the next stage of plumage. I have not found these papillae in any other Brown Pelicans.

The brilliant color of the bare skin of the head and pouch shows considerable variation, traces of the pigment frequently persisting in the dried skin.

The light coloration of the lower surface in the adult is prominent, carrying to an extreme this tendency found in the smaller *murphyi* immediately to the north. The lower surface has the feathers white basally, with a distinct line of white down the shaft to the tip, bordered on this distal portion with gray. The lower surface, therefore, from the base of the neck to the tail is distinctly streaked. As the season advances the dark portions wear away and the basal white correspondingly becomes more prominent. In younger birds that are changing to adult plumage, the lower surface remains extensively white centrally, and above, these birds are more heavily streaked.

The markedly larger size, the caruncles on the bill in the adult, and the brighter coloration of the bare skin of the head and pouch are so different from what is found in other Brown Pelicans that it may develop with complete information that *thagus* should stand as a species.

Smithsonian Institution

Washington, D. C.

August 6, 1945

A NEW SWIFT FROM CENTRAL AND SOUTH AMERICA

BY JOHN T. ZIMMER

IN a collection of Colombian birds submitted for identification and study a short time ago by Brother Nicéforo Maria of the Instituto de la Salle, Bogotá, there was found to my astonishment a specimen of *Cypseloides cherriei*, previously known only from two skins collected on the top of Mt. Irazú, Costa Rica, and preserved in the U. S. National Museum. Through the kindness of Dr. Herbert Friedmann of that institution, I have been enabled to study the type and paratype from which the Colombian bird, taken at San Gil, Santander, in January, 1939, by Brother Nicéforo Maria (No. 308462, American Museum of Natural History), differs principally by the possession of a narrow white chin spot.

This difference, even though slight, is positive and in view of the wide hiatus in the localities, I was at first disposed to regard the Colombian bird as subspecifically distinct from the Costa Rican examples. Before committing myself to the description of a new form, however, I made a careful examination of other Neotropical forms of the genus *Cypseloides* to determine the probability of individual variations in the