

THE EXTINCT CUBAN AND HISPANIOLAN MACAWS (*ARA*, PSITTACIDAE), AND DESCRIPTION OF A NEW SPECIES, *ARA CUBENSIS*

DAVID KENNETH WETHERBEE

Reynolds Road
Shelburne, MA 01370

ABSTRACT

The former existence of an extinct macaw of Hispaniola, *Ara tricolor* Bechstein 1811 in addition to the extinct macaw of Cuba, *Ara cubensis* n. sp. is demonstrated through an analysis of the literature. *Ara tricolor* was of the same superspecies as the extinct macaw of Cuba, *Ara cubensis* but had a white rather than an ochraceous, bare facial area and cere, and was somewhat smaller (6 to 8 mm.) in the size of the bill. *Ara tricolor* became extinct about 1820. As the name *Ara tricolor* Bechstein 1811 was founded upon an Hispaniolan specimen, a name is required for the Cuban macaw: *Ara cubensis* n. sp. Further, I suggest that *Ara gossei* Rothschild 1905, of Jamaica, is not a valid species but instead was probably a "tapiré" artifact, a specimen altered in its coloration by an Amerindian technique.

Cuba and Hispaniola each had macaws, but neither species survived into the 20th Century. The last example of the macaw of Cuba (*Ara cubensis* new species) was shot in 1864 (Bangs & Zappety 1905), whereas the last observation of the macaw of Hispaniola (*Ara tricolor* Bechstein 1811) was made in 1820 by Carl Ritter (1836). There are 15 specimens of these birds. I believe all these specimens are from Cuba but will mention possible exceptions beyond. I contend and will develop later that the type upon which Johann Bechstein [1811; *ex François* Levaillant (1801-1805)] founded *Ara tricolor* was a macaw of Hispaniola. The macaw of Cuba, therefore, is without a name.

Levaillant had seen, and perhaps later acquired, a specimen of *Ara* in the Paris Museum on which his illustration and description were based. I will attempt to show that that specimen was collected about 1798 by

Antonio Gonzales of the Nicolaus Baudin voyage to Puerto Rico and Hispaniola (which voyage is analyzed by Wetherbee (1985)). Following are the historical landmarks in the discovery of, and the discrimination between, the Hispaniolan and Cuban macaws:

Hispaniolan macaws.--

1630.-- I agree with Juan L. de Armas (1888) and Greenway (1967) who indicated that the psittacines mentioned by **Bartolomé** de las Casas (1630) referred to *Ara* and not to *Amazona*. Greenway said, "Las Casas says that there were three kinds of parrots on the island [Hispaniola], a large, a smaller, and a very small one, by which it may inferred that he meant the macaw, the parrot (*Amazona ventralis*), and the small conure (*Aratinga chloroptera*). Probably he meant the red macaw..." Casas (1630) stated, "Los mayores se llamaban por los indios *higuacas*, la silaba de en medio Iuenga, y estos difieren de los de otras islas en que tienen sobre el pico o la frente blanco, no verde ni colorado. Los de esta especie que hay en la

isla Cuba tienen sobre el pico o frente colorado.”

1722.--Labat (1722), who was in Hispaniola between 1693 and 1705 includes a depiction of a psittacine (Book 4, Page 496) perched atop a shed in Hispaniola that seems to be an *Ara*. Various versions of this illustration depict an entirely different species of bird. Pending further research into the validity of the illustration, this evidence is not accepted here.

1779.--Edme Daubenton in Buffon (1779) illustrated (plate 12) a member of the Macao-Group of macaws, “ara rouge”, probably *Ara macao*, and plate 641, a smaller member, “petit ara rouge” which was a macaw “aux Antilles”, usually, correctly believed to be *Ara tricolor*. Buffon wrote:

En général, les aras étoient autrefois très-communs à Saint-Domingue. Je vois, par une lettre de M. de la chevalier Deshayes, que depuis que les établissements français ont été poussés jusque sur le sommet des montagnes, ces oiseaux y sont moins fréquents.” Buffon was a correspondent of Deshayes in Haiti, and Deshayes sent him paintings and much information about Haitian birds. There is no known source of Haitian specimens (Chervain’s contributions of skins from Haiti to René-Antoine Réaumur, Abbé Aubry, and Dr. Antoine-Rémi Mathurin were already well worked over by Brisson (1760) or of drawings, except potentially de Rabié’s (1770-1785) ms.) at Cap “Haitian, I conclude that Buffon had a painting of Deshayes’ or Rabié’s of this macaw, copied by Daubenton. There are Rabié paintings of Hispaniolan *Aratinga* and *Amazona*, depicted from life, in the McGill University Library, but none of *Ara*. As Cuvier and Valenciennes (1828-1849) had seen a painting of a fish, “aigrette vivaneau” (*Lachnolaimus maximus* Walbaum 1792), “fait au Cap-François de Saint-Domingue” dated 1771, which must have been a Rabié painting (he produced many of fishes in that year), some of Rabié’s bird paintings must have reached Paris at that time.

It must not be coincidental that of the 55 birds represented in the Haitian portfolio of Rabié in the McGill Library, none of the dozen common species that Buffon attributed to Deshayes’ drawings appear. I believe that Deshayes pirated from Rabié the pictures seen by Buffon and that “petit ara rouge” was among them as well as the surrogate types for the palm warbler (*Dendroica palmarum*),

Antillean euphonia (*Euphonia musica*), and Hispaniolan trogon (*Temnotrogon roseigaster*). The mystery is how the 39 potential surrogate types in the Rabié collection escaped notice (Wetherbee ms. a).

Buffon (1779) believed “ara rouge” and “petit ara rouge” were varieties of the same species. (Note: Clark (1905) makes an erroneous reference to Brisson (1760) regarding “petit ara rouge”, when he intended, instead, Buffon (1779).)

1788.--Petrus G. Lindroth (Lönnberg 1929), in cataloging the bird collection of Adolf U. Grill, shows” No. 413. *Psittacus Aracanga*, Le Petit Ara rouge”. This bird is now in the Stockholm museum. The probable origin of the specimen is a complex matter which will be elucidated elsewhere (Wetherbee, ms. c). Whether it is Cuban or Hispaniolan remains to be determined. Alternative hypotheses would make it either a Franz Maerter Haitian specimen, pirated by Capt. N. Baudin from an Austrian expedition, or an Olof Swartz specimen from either Haiti or Cuba. If Haitian, it is probably the sole existing representative of *Ara tricolor*.

1796.--The Baudin voyage and its implications. Andre-Pierre Ledru (1810) in his list of “Puerto Rican” bird skins in the Paris Museum taken by the Baudin voyage, included “Le petit ara rouge, *Ara aracanga*.” The determinations on that list were made by François M. Daudin, not by botanist Ledru, a decade earlier. A footnote states that the Latin names, if not otherwise indicated as to author, came from Daudin (1799) and one of the species in the list, *Loxia portoricensis*, which Daudin had already described (1800), still bore the designation “nouvelle espèce”.

I have recently shown (Wetherbee, mss. a&b) that Ledru’s list is a composite of specimens taken in Puerto Rico and (covertly) in Hispaniola by the Baudin voyage. Included were several Hispaniolan endemic birds (Wetmore and Swales, 1931, notwithstanding); for example, “Le tangara ou l’esclave, *Tangara Dominica*” (= palmchat, *Dulus dominicus*). I have recently examined secret reports (Wetherbee 1985) that prove the exploration of Hispaniola by two naturalists of the Baudin voyage (Advenier and Hogard). Descourtiz (1809) also gave an account of meeting these two naturalists in Haiti in 1799, along with a third, Capt. Baudin’s painter and zoologist, Antonio Gonzales. Further, the known collections of the Baudin voyage contain many endemic butterflies (e.g. *Anar-*

tea Lytrea Godart 1819), endemic beetles (e.g. *Hogardia roussatra* Lapeletier 1845) and endemic land-mollusks (e.g. *Polydontes oblitterata* **Férussac** 1821).

The expedition which left France on 3 October 1796 on the *Belle Angelique* returned to France aboard the *Triomphe* on 7 June 1798, after exploring the Virgin Islands, Trinidad, and Puerto Rico. The three naturalists, Advenier, Hogard and Gonzales were left behind to do further collecting and espionage for the French government. Professor Lamarck of the Paris Museum dates his receipt (Ledru 1810) of the invertebrate collection as 4 March 1799. Daudin described the first new bird from the voyage in 1800.

Upon receipt of the 700 bird skins from the expedition, Daudin was charged with arranging them in the Paris Museum gallery. From this curatorial effort arose Daudin's "Tableau des Oiseaux", edited by **Lacépède**, in Buffon's *Historic naturelle* (1779) which formed the authority for the Ledru (1810) list, Daudin (1803b), and Jean B. Audebert and Louis Vieillot (1802) had only begun to describe the new species (six of them published) to which Daudin had affixed manuscript names (erroneously credited to **Lacépède** by authors), when both he and Audebert died (in 1800 and 1804, respectively). Capt. Baudin and his zoologist of the Puerto Rican voyage, **René Maugé**, never returned from a subsequent voyage to Australia in 1801-1804).

The collection immediately suffered attrition; some of the specimens were acquired by Dufresnaye (an aide in the museum) and by **Masséna**, Duke of Rivoli (others can be traced). Levaillant probably had the *Ara* from the gallery upon which he based "**Lacépède's**" (= Daudin's, = Gonzales') *Ara tricolor*. At the same time, Audebert's and Vieillot's 1803 green mango (*Anthracothonax viridis*) and Puerto Rican emerald (*Chlorostilbon maugaeus*), as well as Daudin's frog *Rana maculata* (probably *Leptodactylus albilabris*) disappeared from the gallery. Levaillant, himself, had an Hispaniolan trogon that could only have come from this collection, and **Masséna** had the Hispaniolan Parakeet (*Psittacus [Aratinga] chloroptera*) and Puerto Rican Parakeet (*P. [A.] raugei*). The Puerto Rican tody (*Todus mexicanus*), which appears in Ledru's (1810) list as from the Virgin Islands (in error, although the voyage did go to St. Thomas and St. Croix), fell into

the hands of dealer, Jules Verreaux, and was thought to have come from "Vera Cruz", Mexico, obviously an error for "St. Croix".

It is axiomatic that Puerto Rican and Hispaniolan endemics first described between 1800-1820 were Baudin voyage specimens (however disguised). All Hispaniolan materials taken on that voyage, without exception, were deliberately obfuscated in one way or another by the staff at the Paris Museum. This conspiracy was based on the espionage aspect of that leg of the voyage, together with Capt. Baudin's well-founded reputation as a pirate (Michaud 1811, Ord 1849). I posit, too, that some of this material was stolen by Baudin from the Maerter voyage.

During the first decade, there were scurrilous thefts and exchanges of Baudin voyage specimens which were then given falsified type-localities. The unusual were the first to disappear. Audebert's and Vieillot's (1802) published hummingbirds were not even cited by Ledru (1810). A thorough research of the type-specimens of Hispaniolan (and Cuban) endemic vertebrates, butterflies, and snails reveals that the activity of Gonzales (disguised as that of **Maugé** on Puerto Rico) was the only source of Hispaniolan bird skins since the remote days of Chervain in the time of Brisson. Levaillant's yellow-necked macaw, I conclude, is a specimen of the Baudin voyage.

Cuba, unlike the other islands of the West Indies, had no proved bird collectors until 1822 when Eduard Poepping and **Ramón** de la Sagra started their serious work there. I cannot point to any potentially reasonable collector of a macaw in Cuba that would be in the Paris Museum at the time Levaillant described the specimen upon which Bechstein (1811) founded *Ara tricolor*. The reputed work of **José Guío** and Atanasio Echevarria, cited by **Hernández** (1968) and Trellis y **Govín** (1927), in Cuba, is very poorly documented and would hardly concern Paris Museum specimens.

1799.--Michel Descourtilz was sent by the French Academy (by **Lacépède**) to Haiti in 1799 in a disguised attempt to rescue Advenier, Hogard, and Gonzales, or their collections, through Commissioner Roume in Santo Domingo. Descourtilz made a collection of birds and a portfolio of paintings but these were lost at the time of his captivity during the Haitian revolution. Commissioner Roume was arrested and the three Baudin natural-

ists were probably murdered. Descourtilz (1809), vol. 3:201) wrote the following, based on his four years experience in Hispaniola: "Parmi ceux de Saint-Domingue, on distingue l'Amazone à tete jaune, ou perroquet du **Brésil, très-commun** dans la partie espagnole; l'Amazone (petit) à tete blanche, qui habite les mornes de la partie **française**, et le Papegai à bandeau rouge."

"Ces trois **espèces**, quoique soumises à de pareilles habitudes, n'ont point les **mêmes** moeurs; at l'amazone à tete jaune, plus gros de corps, est plus lent dans ses **manières**, et plus silencieux que les deux autres, dont le babil est continuel. Ils habitent tous trois les montagnes **élevées** de l'île."

Just as Las Casas had made the distinction of size classes of his psittacines, Descourtilz made it clear that "L'Amazone à tete jaune" which he saw in the mountains of Cibao Province, was the largest of the three species, and the yellow coloration, size, and habits could only refer to the Hispaniolan *Ara*. Wetmore and Swales (1931) were mistaken in calling the vernacular name of this bird an error! If Commissioner Roume had not already sent a specimen of it to Baudin in Puerto Rico, he and Descourtilz must have sent the Gonzales specimen (the type) to the Paris Museum at this time, as this was Descourtilz' mission.

Descourtilz' vernacular nomenclature is entirely excusable and defensible when we consider that his best reference was Buffon who "lumped American parrots into birds with yellow, red, or white heads. Buffon dwells on the general confusion in the use of *Ara* and *Amazona*. "Petit ara rouge" which Levaillant preferred to call the yellow-necked ara (the yellow also extends onto the head) was considered to be a variety of "ara rouge" of Brazil. Descourtilz' "l'Amazone à tete **blanché** is the **Hispaniolan** Parrot (*Amazona ventralis*). "Papegai à bandeau rouge" is the Hispaniolan Parakeet (*Aratinga chloroptera*). Regarding the latter, at the time of Descourtilz, one had to account for a "Perroquet à bandeau rouge de Saint Domingue", because the Puerto Rican Parrot (*Amazona vittata*) had been so dubbed, while *A. ventralis*, the real *Amazona* of Hispaniola had been erroneously designated "Perroquet ventralis à ventre pourpre de la Martinique".

We should place full confidence in the writings of Descourtilz, for, in addition to his own observations, he had the information supplied by the other three naturalists --

seven years of intensive exploration in both the east and west of Hispaniola. Wetmore mistook Descourtilz for an adventurous Nimrod, whereas actually this heroic person was an official representative of the French Academy, was a discriminating naturalist, and brought the Baudin voyage to a brilliant conclusion with his wonderful books. Ledru (1810) put together a somewhat less than honest, perfunctory report of the voyage.

1801-1 Levaillant's "Histoire naturelle des perroquets" (1801-1805) contained a representation (plate 5) of a yellow-necked macaw by artist Barriland. The very adequate description does not include a type-locality for the Paris Museum specimen (which must have been Gonzales'), nor could it, for it was officially forbidden to pronounce Las Casas' "Dell'Isola Spagnuola".

"Nous avons **adopté** le nom d'Ara tricolor, sous lequel le citoyen **Lacépède** a **désigné** cette **espèce** dans les galeries du Museum d'histoire naturelle de Paris; mais peut-être seroit il plus exact de lui donner un nom qui le confondit moins avec l'Ara canga et l'Ara macao. Le nom d'Ara nuque-jaune l'isoleroit de toutes les autres **espèces**, et lui conviendrait d'autant mieux qu'il est le seul de tous des Aras connus qui ait le **derrière** du cou de cette couleur."

Rothschild (1907) translated Levaillant's description: "... the bill 18 lines. The latter is of a black colour and has the upper mandible less curved, and the sides of the lower mandible more swollen than in the case of the other *Ara* species. The cheeks are naked and white with three lines of red feathers." Barriland's figure shows a bird with ochraceous plumage on the head, not darker toward the forehead, and the cere and bare skin are decidedly white. Subsequent authors and artists, working with Cuban material have been influenced by this description of a Hispaniolan bird and have painted or described Cuban macaws with white faces or have hedged, in compromise, and made them whitish. As we shall see, neither Wagler (1835) nor Ridgway (1916) made any such compromise of the fact that Cuban macaws did not have white faces.

1811.--Johann Bechstein gave Levaillant's small, red, yellow-necked macaw the binominal *Ara tricolor*, taken from **Lacépède's** (actually Daudin's) manuscript. Bechstein's plate was copied from Levaillant's. Whereas Levaillant had not given a provenience to the birds, Bechstein (1811)

played it safe and called it of South America.

1816.--Louis Vieillot (1816) re-copied Levaillant's work. Vieillot began his career in ornithology while living in Haiti as a business person. He was ruined by the Haitian revolution and fled to the United States, then France, empty-handed, in the mid-1790's. He was aware that a macaw was formerly found in Haiti, but in error attributed it to *Ara macoa* after Boddaert (1783). His book also contained a "petit ara rouge", without provenience.

1820.--Carl Ritter made valuable, pioneer collections of vertebrates in Haiti in 1820. His list of birds (1836) contained "*Psittacus ochracephalus*" which I interpret to mean the Hispaniolan macaw. He may have been the last to see this species alive.

Cuban macaw.--

1835.--Johann Wagler (1835) was the first to describe what was apparently the macaw of Cuba. By this time, but not before 1820, there had been several bird collectors in Cuba: Edward Poepping in 1822-24, following Ritter; Prince Paul of **Württemberg** in 1822-24 and 1829; Alexandre Ricord in 1826; William MacLeay in 1827-1836; and the naturalists Ramon de la Sagra and Alcide D'Orbigny in 1826.

Wagler's bird differed so much from that of previous authors (who, I contend had reference only to macaws of Hispaniola) that he called Daubenton's (1779) plate 641 "figura mala"; that of Levaillant, "description opt., figura accur, excepta faciei pictura". He goes on to describe the bird: "Captis latera nuda, rugulosa, *laete ochracea* (emphasis, mine) ...Mus. Paris; specimen vivum nitidissimum, mitissimum descripti Monachii."

1840.--Alcide D'Orbigny, who was in Cuba briefly in 1826 was chosen by de la Sagra to write the volume on birds for his comprehensive series. This was a poor choice, but at least D'Orbigny (1840) included in his compilation the first mention of the macaw occurring in Cuba.

1847.--Philip H. Gosse and Richard Hill (1847) mention in their "Birds of Jamaica" that Anthony Robinson had seen a mounted specimen, allegedly taken in Jamaica in 1765, of a small, red macaw. The specimen was lost. This bird had a yellow, not red, forehead and some yellow instead of blue in the mainly red tail. Rothschild (1905) erected a new species *Ara gossei* upon the description, I agree with Lack (1976) that this bird (of unknown size) probably did not

represent a wild population of a yellow-necked macaw in Jamaica. In this connection, **Lacépède** (1788), Daudin (1803a) and Buffon (1779) dwell upon the practice of the natives in South America painting the developing feathers of parrots with the body fluids of the poison-dart frog, *Rana tintorio* (= *Calamita tinctoria* Schneider 1799), which changed the colors to reds and yellows. As these birds were sold to traders, I believe Robinson had such a specimen, a "tapiré".

1856.--Charles de **Souancé** (1856) listed a specimen of *Ara tricolor* in the collection of Prince **Masséna** d'Essling. As both *Aratinga chloroptera* and *A. maugéi* are also included in **Souancé's** list. **Masséna** may have had the Baudin voyage specimen of "petit ara rouge"; it may still exist.

1861.--Juan Gundlach had more personal experience with the Guacamayo (Cuban macaw) than any other ornithologist. The bird is mentioned in several of his papers (1861, 1871, 1874, 1876, 1895) but he says nothing that would be diagnostic of the Cuban representative of the yellow-necked macaws. Gundlach collected several specimens.

1867.--Otto Finsch (1867) described a yellow-necked macaw from a living specimen in the Amsterdam Zoo. The naked face in life was "gelblichfleischfarben" and was therefore probably a Cuban macaw rather than the white-faced macaw of Hispaniola, which had probably been extinct about a half century.

1886.--Charles Cory (1886) describes the Cuban macaw as "probably" having "dull white" cheeks. Count Salvadori (1891) seems to have copied Cory's words. The two specimens in the British Museum were labeled South America.

1905.--Austin H. Clark (1905) thought that there had been a "closely related species or subspecies" of the Cuban macaw in Haiti, and this same year, Walter Rothschild (1905) states, "This in my opinion must have been a third species (first, *A. tricolor*, second, *A. gossei*) but we have no definite description of it."

1907.--Lord Rothschild (1907) mentions that a single specimen in the Paris Museum was one of M. E. Rosseau's from Cuba, an 1842 managerie bird. (Levaillant's type, of the Hispaniolan taxon, had probably been missing for a century.)

1916.--Robert Ridgway (1916) handled

three specimens, presumably all of the Cuban taxon. It is significant that this incomparably expert ornithologist states: "naked skin of face pale (probably pink or flesh color in life)". Ridgway does not say white.

1931.--Alexander Wetmore and Bradshaw (1931) provided useful synonymies that supplement those of Ridgway (although they missed much of importance such as Alexandre Ricord's Haitian bird specimens in the Leydon Museum (Schlegel 1863). Wetmore was oblivious to the abundant clues available that Ledru's list (1810) contained Hispaniolan birds. He also failed to recognize Descourtilz' (1809), Ritter's (1820), and Las Casas' (1630) references to the Hispaniolan macaw, allocating them to *Amazona* by default.

The Cuban macaw can no longer be called *Ara tricolor* as I restrict the type-locality of *Ara tricolor* to Hispaniola. Since the Cuban macaw is now without a binominal, I designated it as:

Ara cubensis new species

Type.--Museum of Comparative Zoology No. 72,526, formerly in Lafresnaye collection, no. 7, "in fine condition (a relaxed mount), but has one wing clipped, which suggests that it was a cage-bird secured in France." (Barbour 1943). "Cuba".
Measurements.--Wing, 276 mm.; exposed culmen, 45 mm.

Ridgway's measurements (1916), in millimeters, were taken of three skins, of undetermined sex, presumably of the Cuban species: "Length, about 485-510; wing, 276-288 (283.3); tail, 290-305 (297.5); culmen, 43.5-45 (44.3); tarsus, 23-25 (24.3); outer anterior toe, 32.5-35.5 (33.17)." Distribution.--The island of Cuba and Isle of Pines. Extinct.

Diagnosis.--The small (500 mm.), red macaw of Cuba, of the Macao-Group, closely resembling, and in the same superspecies as *Ara tricolor, sensu novo* of Hispaniola, but with culmen longer by 6 to 8 mm. and with cere and bare-areas about the eye "rich ochraceous" (Wagler 1835). As the bill is longer, *Ara cubensis* may be a larger bird than *Ara tricolor*. Except for the above differences, Ridgway's (1916, p. 79) description of *Ara tricolor, sensu prior* suffices for *Ara cubensis*.

Ara tricolor, of Hispaniola, has pure white cere and bare facial skin, and a culmen length of 38.1 mm. (= 18 lines, Levaillant (1801-1805).

Remarks.--To call these two birds subspecies would have preserved the name *tricolor* for the macaw of Cuba, but as the nominate race would apply to the Hispaniolan bird, there would have accrued no real advantage. Further, it is consistent with my notions regarding populations in the West Indies to call these two birds, on different islands, full species. The recent designation by authors (Ottenwalder ms; Snyder, Wiley, and Kepler ins., Olson ms.) of full species rank for *Ara tricolor chloroptera* of Hispaniola and *A. maugei* (extinct) of Puerto Rico, supports this treatment.

The synonymy for *Ara cubensis*, new species, is that given by Ridgway (1916) for *Ara tricolor, sensu prior*, except that a cleavage must be made, setting Wagler (1835) as the first reference for *Ara cubensis*. Exceptions are Ritter (1836), who had waited 16 years to publish and possibly Souancé (1856), who may have had Levaillant's type of *Ara tricolor, sensu novo*. As authors after Wagler probably had reference to composite sources, only works that treat original data can be judged to have integrity. I have not seen any published figure for *Ara cubensis* that has not been influenced by descriptions of *Ara tricolor, sensu novo*. A complete presentation of the literature is given by Wetherbee ms. c).

The small amount of difference between the two macaws does not bode well for expectations of finding on Puerto Rico the remains of any macaw that evolved from Hispaniola, assuming a west to east route. While there is good justification for assuming that most Hispaniolan species were derived from Central America via Cuba, the white face of *Ara tricolor* suggests that it had a closer affinity to *Ara rnao* than did *Ara cubensis*. The invasion route is, therefore, not clear.

ACKNOWLEDGEMENT

Dr. James W. Wiley kindly made many editorial suggestions on shortening my manuscript.

LITERATURE CITED

- ARMAS, J. I. DE. 1888. La **zoología** de Colón y de los primeros exploradores de **América**. Habana.
AUDEBERT, J. B. AND L. J. P. VIEILLOT. 1801. Oiseaux **dorés** ou à reflets **métalliques**. 2 vols. Paris.
BARBOUR, T. 1943. Cuban ornithology. Nuttall Ornith. Club. Cambridge, Massachusetts.

- BANGS, O. AND W. R. ZAPPEY. 1905. Birds of the Isle of Pines. *American Nat.* 39:179-215.
- BECHSTEIN, J. M. 1811. *In* Latham's Allgemeine Uebersicht der Vögel, 4 (1): 64. Nürnberg, 4 vols.
- BODDAERT, P. 1783. Table des planches enluminées d'histoire naturelle (of E. L. Daubenton).
- BRISSON, M. J. 1760. *Ornithologie*. 6 vols.
- BUFFON, G. L. L. DE. 1779. *Histoire naturelle des oiseaux*. 7 vols.
- CASAS, B. DE LAS. 1630. *Historia de las Indias*. 5 vols. Madrid.
- CLARK, A. H. 1905. The Greater Antillean macaws. *Auk* 22:345-348.
- CORY, C. B. 1886. The birds of the West Indies, including the Bahama Islands, the Greater and Lesser Antilles, excepting the islands of Tobago and Trinidad. *Auk* 3:454-472.
- CUVIER, G. AND A. VALENCIENNES. 1828-1849. *Historia naturelle des poissons*.
- DAUBENTON, E. L. 1779. Planches enluminées, vol. 7, pl. 12, 641.
- DAUBIN, F. M. 1799. Tableau du sous-classes ... des oiseaux, par Lacépède; avec l'indication de toutes les espèces décrites par Buffon ... par F. M. Daudin. *In* Buffon's *Histoire naturelle, Quadrupèdes*, vol. 14:197-346.
- _____. 1803a. *Histoire naturelle des rainettes, des grenouilles et des crapauds*. Paris. Levrault.
- _____. 1803b. Description d'une nouvelle espèce de pic (*P. portoricensis*) trouvée a Porto Rico, Paris Mus. *Hist. Nat. Annal.* 2:285-286.
- DESCOURTILZ, M. E. 1809. Voyages d'un naturaliste, et ses observations faits sur les trois règnes de la nature... St. -Domingue, 3 vols.
- FINSCH, O. 1867. Die Papageien, monographischen bearbeitet. vol. 1. Leiden, E. J. Brill.
- D'ORBIGNY, A. D. DE 1840. *Ornithologie*. *In* de la Sagra's *Histoire physique, politique et naturelle de L'île de Cuba*. Paris.
- GOSSE, P. H. AND B. HILL 1847. *The birds of Jamaica*. London. John Van Voorst.
- GREENWAY, J. C., JR. 1967. *Extinct and vanishing birds of the world*, 2nd rev. ed., New York, Dover Publ.
- GUNDLACH, J. 1861. Tabellarische Uebersicht aller bisher auf Cuba beobachteten Vögel. *Journ für Ornith.* 9:321-349.
- _____. 1871. Neue Beiträge zur Ornithologie tubas. *Journ. für Ornith.* 19:265-295; 20:401-431.
- _____. 1874. Neue Beiträge zur Ornithologie cubas. *Journ. für Ornith.* 22:286-303.
- _____. 1876. Contribution à la ornithologia cubana. Habana.
- _____. 1895. *Ornithologia cubana ó catálogo descriptivo de todas las especies de aves tanto indígenas como de paso...* Habana.
- HERNANDEZ, O. L. 1968. La zoología en Cuba desde 1868-1968. *Acad. de Cien. de Cuba Ser. Bio.* 44.
- LABAT, J. B. 1722. *Nouveau voyage aux îles de l'Amérique contenant l'histoire naturelle de ces pays*.
- LACÉPÈDE, B. G. E. 1788-1789. *Histoire naturelle des quadrupèdes ovipares et des serpens*. 2 vols.
- LACK, D. 1976. *Island biology, illustrated by the land birds of Jamaica*. Univ. California Press, Berkeley.
- LEDRU, A. -P. 1810. *Voyage aux Îles de Ténériffe, La Trinité, Saint Thomas, Saint Croix at Porto-Ricco...* Paris, 2 vols.
- LÖNNBERG, E. 1928. Kubas Arapapegoja *Ara tricolor* Bechst. *Fauna och Flora*. 1928:203-208.
- LEVAILLANT, F. 1801-1805. *Histoire naturelle des perroquets*. vol. 1.
- MICHAUD, J. F. 1811. *Biographie univeselle ancienne et moderne*. 3:278-279. Graz, Austria.
- ORD, G. 1849. A memoir of Charles Alexander Lesueur. *American Journ. Sci.* 2(8):189-220.
- RABIÉ, DE. 1770-1785 MS. Collection des oiseaux de St. Domingue peints d'après nature par Mr. de Rabié, maréchal de camp. ingénieur en chef de la partie du nord de St. Domingue, mort à Paris, en 1785. (ms. paintings in Blacker-Wood Library, McGill University.)
- RIDGWAY, R. 1916. The birds of North and Middle America. *Bull. U.S. Nat. Mus.* 50(7):1-543.
- RITTER, C. 1836. *Naturalhistorische Reise nach der Westindischen Insel Hayti auf Kosten Sr. Majestat des Kaisers von Oesterreich*. Stuttgart 1-206.
- ROTHSCHILD, W. 1905. Notes on extinct parrots. *Bull. British Ornith. Club* 16:14.
- _____. 1907. *Extinct birds*. Hutchinson & Co., London.
- SALVADORI, T. 1891. *Catalogue of the Psittaci, or parrots in the British Museum*, British Museum.
- SCHLEGEL, H. 1863. *Muséum d'histoire naturelle des Pays-Bas. Revue méthodique et critique des collections de posées dans cet établissement*. 1862-1880.
- SOUANCÉ, C. DE. 1856. *Catalogue des perroquets de la collection du prince Masséna, duc de Rivoli, et observations sur quelques espèces nouvelles ou peu connues de psittacidés*. *Revue et Mag. de zoologie* 8:56-64, 152-158, 208-226.
- TRELLES Y GOVIN, C. M. 1927. *Bibliografía cubana de los siglos XVIII y XVIII*. Imp. del Ejército, Habana.
- VIEILOT, L. J. P. 1816. *Nouveau dictionnaire d'histoire naturelle appliquée aux Arts ... vol. 2.* (1816-1819).
- WAGLER, J. G. 1835. *Monographia Psittacorum*. Denker. k. Bayer Akad. Wissensch. München.
- WETHERSEE, D. K. (MS. a). *Zoological exploration of Haiti for endemic species*.
- _____. (MS. b). *Zoological exploration of Puerto Rico for endemic species*.
- _____. (MS. c). *Les petits aras rouges. (Monograph on the Ara tricolor superspecies)*.
- _____. 1985. Discovery of secret 1799-1801 manuscript reports of importance to natural history of the Dominican Republic. *In* Wetherbee, D. K.; *Contributions to the early history of botany in Hispaniola and Puerto Rico*, 173-215. (Privately published, Wetherbee, Shelburne, Massachusetts).
- WETMORE, A. AND B. SWALES 1931. *The birds of Haiti and the Dominican Republic*, *Bull. U. S. Nat. Mus.* 155:483 pp.

