

NOTES ON THE BATS COLLECTED BY WILLIAM PALMER IN CUBA.

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Two important collections of Cuban bats have recently been made by Mr. William Palmer, of the United States National Museum. The first, numbering 449 specimens, was brought together during February, March, April, May, June, and July, 1900, in the region south and west of Habana, and on the Isle of Pines.^a During this expedition Mr. Palmer was accompanied by Mr. J. H. Riley. The second collection, 184 specimens, was made in February, 1902, at the extreme eastern end of Cuba.^b Fifteen species were obtained in all, several of which prove to be of unusual interest. In the following account of this material the field observations made by Mr. Palmer are given in full, each note signed with its author's name.

VESPERTILIO CUBENSIS (Gray).

1839. *Scotophilus cubensis* GRAY, Ann. Nat. Hist., IV, p. 7, September, 1839; Cuba.
1892. *Vesperugo fuscus cubensis* CHAPMAN, Bull. Amer. Mus. Nat. Hist., IV, p. 316, December 29, 1892.
1897. *Vespertilio fuscus cubensis* MILLER, North American Fauna, no. 13, p. 102, October 16, 1897.

A skin from Pinar del Río and a specimen in alcohol, and one skin each from El Guama and El Cobre. The three skins show that the color of the Cuban animal is practically identical with that of the large Mexican *Vespertilio miradorensis*. It is therefore much darker than in *V. fuscus*. For measurement see table, page 338.

Field notes.—One of the few species seen flying at dusk. Besides the five specimens taken, three or four others were seen. One was captured in a net set at the eaves of a tile roof. Others were seen about tobacco houses and palm trees. One was netted in the center of a natural rock tunnel, which was the home of a barn owl, a bird that fed largely on bats.—W. PALMER.

^aThe localities at which bats were taken are as follows: Cabañas, El Guama, Guanajay, Mariel, Pinar del Río, and San Diego de los Baños on the mainland, and Nueva Gerona on the Isle of Pines.

^bExact localities, Baracoa and El Cobre.

NYCTICEIUS CUBANUS (Gundlach).

1861. *Vesperus cubanus* GUNDLACH, Monatsber. k. Preuss. Akad. Wissensch. Berlin, p. 150; near Cardenas, Cuba.

1897. *Nycticeius humeralis cubanus* MILLER, North America Fauna, no. 13, p. 120, October 16, 1897.

Twenty-six specimens (16 skins) from Pinar del Rio, and one skin from Cabanas. This series makes a satisfactory comparison of the Cuban *Nycticeius* with its mainland representative for the first time possible. The Cuban animal proves to be, as Gundlach's description indicates, considerably smaller than *Nycticeius humeralis*, but in color the two species are identical, and in external form the only difference that I can detect is the slightly less breadth of the ear and tragus in *N. cubanus*. The skull and teeth are conspicuously smaller in the Cuban bat, but in form there appears to be perfect agreement. For measurements see table below.

Field notes.—The specimens from Pinar del Rio were all taken from the eaves of a tiled roof where several species of bats of different genera spent the day. In the evening they usually began to fly when it was quite dark, so that one was seldom seen on the wing. The single specimen from Cabañas was captured in a ruined house.—W. PALMER.

Measurements of Vespertilio cubensis, Nycticeius cubanus, and N. humeralis.

Name.	Locality.	Number.	Sex.	Total length.		Tail.	Tibia.	Foot.	Forearm.	First digit.		Third digit.	Fourth digit.	Fifth digit.	Ear from meatus.	Ear from crown.	Width of ear.
				mm	mm					mm	mm						
<i>Vespertilio cubensis</i> .	Pinar del Rio.	103809	Female.	105	47.0	19.0	10.0	47.0	9.0	45.0	80	70	60	.....	.....	.....	.....
Do.....	El Guama.	103810	Male	117	47.0	19.0	9.8	45.0	8.0	45.0	77	67	55	.....	.....	.....	.....
Do.....	do	103807	do	103	44.0	18.8	9.0	43.6	8.0	41.0	75	66	58	15.4	13.0	11.0	.....
Do.....	El Cobre.	113851	do	104	45.0	20.0	10.0	44.0	7.4	44.0	81	70	57	.....	.....	.....	.....
<i>Nycticeius cubanus</i> .	Cabañas	103797	Female.	.....	.....	12.0	6.0	32.0	6.0	30.0	55	45	40	.....	.....	.....	.....
Do.....	Pinar del Rio.	103781	do	78	26.0	10.0	6.2	31.0	6.0	29.0	56	47	40	.....	.....	.....	.....
Do.....	do	103782	do	77	28.0	11.0	7.0	31.0	6.0	30.0	54	47	38	.....	.....	.....	.....
Do.....	do	103783	do	83	31.0	11.6	7.0	31.0	6.4	30.0	57	48	39	.....	.....	.....	.....
Do.....	do	103786	do	81	29.0	11.0	7.0	30.6	5.0	30.0	54	48	39	.....	.....	.....	.....
Do.....	do	103789	do	79	28.0	10.0	7.0	32.0	6.0	28.0	55	47	38	.....	.....	.....	.....
Do.....	do	103784	Male	80	30.0	11.0	7.0	30.0	5.0	27.0	54	48	39	.....	.....	.....	.....
Do.....	do	103785	do	80	30.0	11.0	6.0	29.0	5.0	27.0	52	46	37	.....	.....	.....	.....
Do.....	do	103787	do	73	25.0	11.0	6.4	29.0	5.4	28.0	55	47	35	.....	.....	.....	.....
Do.....	do	103788	do	75	27.0	11.0	6.8	30.0	5.0	28.0	55	47	38	.....	.....	.....	.....
Do.....	do	103799	do	80	29.0	10.6	6.0	28.6	5.4	28.6	52	44	37	.....	.....	.....	.....
Do.....	do	103801	do	78	29.0	9.0	6.4	32.0	5.4	28.0	55	50	42	11.0	8.0	7.0	.....
Do.....	do	103802	do	74	30.0	10.0	5.6	32.6	5.0	31.0	51	46	39	12.0	9.0	8.0	.....
Do.....	do	103798	Female.	75	32.0	10.0	5.6	31.0	4.4	28.0	55	48	40	11.0	8.2	7.4	.....
Do.....	do	103799	do	8.	33.0	11.4	6.0	32.4	6.0	29.0	59	52	44	10.4	8.8	8.0	.....
Do.....	do	103800	do	80	31.0	11.0	6.4	32.0	5.8	31.0	58	52	43	11.0	9.0	8.0	.....
Do.....	do	103803	do	80	33.0	11.0	5.6	31.0	5.6	29.0	56	48	39	11.8	10.0	7.4	.....
Do.....	do	103804	do	79	29.0	10.6	5.6	32.0	5.0	30.6	56	49	42	11.0	9.0	7.6	.....
Do.....	do	103805	do	78	30.0	10.4	6.0	32.0	6.0	28.0	55	49	42	12.0	9.4	8.0	.....
<i>Nycticeius humeralis</i> .	L e m o n City, Fla.	102710	Male	95	39.0	12.0	8.0	36.0	6.6	35.0	67	58	49	13.0	10.6	10.0	.....
Do.....	do	102711	do	90	35.0	12.0	7.8	33.6	6.0	34.0	63	54	45	15.0	10.0	9.8	.....
Do.....	do	102712	do	87	35.0	11.6	7.4	.....	7.0	35.0	63	.....	.....	13.0	10.0	10.0	.....
Do.....	do	102713	do	91	35.0	12.0	7.0	35.0	6.0	33.0	65	58	49	13.0	10.0	10.0	.....
Do.....	do	102709	Female.	95	39.0	12.4	7.4	36.0	6.2	34.0	67	58	50	14.0	10.0	10.0	.....

MOLOSSUS TROPIDORHYNCHUS Gray.

1839. *Molossus tropidorhynchus* GRAY, Ann. Nat. Hist., IV, p. 6, September, 1839.

Fourteen skins and eleven alcoholic specimens from Pinar del Rio, and five (3 skins) from El Cobre. This is the Cuban representative of *Molossus obscurus*. It is readily distinguishable from the South American species by its much smaller size. For measurements see table, page 340.

Field notes.—Probably the most abundant of the species living together under a tile roof at Pinar del Rio. Like the others they emerge suddenly from their roosting place very late in the dusk of evening, and after flitting a few times about the roof are gone. At El Cobre the specimens were likewise collected under the tiles of a roof.—W. PALMER.

PROMOPS GLAUCINUS (Wagner).

1843. *Dysopses glaucinus* WAGNER, Wiegmann's Archiv für Naturgesch., 1843, I, p. 368.

1861. *Molossus ferox* GUNDLACH, Monatsber. k. Preuss. Akad. Wissensch. Berlin, p. 149 (not of Tschudi, 1844–1846); Cuba.

One specimen (in alcohol) was taken under a tile roof at Pinar del Rio, February 27, 1900. For measurements see table, page 340.

NYCTINOMUS MUSCULUS Gundlach.

1861. *Nyctinomus musculus* GUNDLACH, Monatsber. k. Preuss. Akad. Wissensch. Berlin, p. 149.

1902. *Nyctinomus musculus* MILLER, Proc. Biol. Soc. Washington, XV, p. 248, December 16, 1902.

Three in alcohol and five skins from El Guama, one skin from Cabañas, and one (in alcohol) from Pinar del Rio.

This species is readily distinguishable from both *Nyctinomus basilienensis* and *N. cynocephalus* by its small size, the character pointed out by Gundlach in the original description. A further peculiarity of the Cuban animal, apparently shared by all the West Indian members of the group, is the minute size and rudimentary structure of the first upper premolar. In the continental species this tooth is well developed and provided with a distinct cingulum, while in the insular forms it is a mere terete spicule. For measurements see table, page 340.

Field notes.—Occasionally seen about dark among the hard limestone hills of the mountainous districts. Here it spends the day in the smaller crevices of the caves, with *Artibeus parvipes*. We could find none during the day, although the *Artibeus* was common and conspicuous, but by closing all but one of the entrances to a cave and hanging a fine net over this opening at night we usually obtained one or more of these little bats the next morning. The specimen from Cabañas was captured in a house.—W. PALMER.

Measurements of Cuban molossidæ.

Name.	Locality.	Number.	Sex.	Measurements																
				Total length.	Tail.	Tibia.	Foot.	Forearm.	First digit.	Second digit.	Third digit.	Fourth digit.	Fifth digit.	Ear from meatus.	Ear from crown.	Width of ear.				
<i>Molossus tropidodryhynchus.</i>	Pinar del Rio.	103760	Male	88	31.0	10.2	7.8	34.0	6.0	35	69	54	38	11.0	8.0	11.6				
Do	do	103763	do	89	32.0	11.0	8.0	34.0	6.0	34	69	53	37	11.0	9.0	12.0				
Do	do	103761	Female	87	30.0	11.0	7.6	34.0	6.2	34	69	53	37	11.8	9.0	13.0				
Do	do	103762	do	85	29.0	11.0	7.4	34.0	6.2	35	70	54	37	11.8	9.0	12.0				
Do	do	103764	do	86	29.6	10.0	7.6	33.6	6.0	34	67	51	35	11.0	8.0	11.0				
Do	do	103765	do	88	33.0	10.0	7.0	33.0	6.0	33	66	49	35	10.2	8.4	12.0				
Do	do	103766	do	87	32.0	10.4	7.0	34.0	6.4	35	67	52	37	12.0	9.8	13.0				
Do	do	103767	do	84	31.0	10.4	7.0	33.4	6.0	34	67	50	37	11.8	9.0	13.0				
Do	do	103768	do	86	32.0	10.2	7.2	33.0	6.0	35	66	50	36	11.0	8.0	12.0				
Do	do	103769	do	90	31.0	10.6	7.4	34.0	6.2	34	68	51	37	12.0	8.8	13.0				
<i>Promops grayii.</i>	do	103827	Male	133	49.0	20.0	10.4	59.0	9.0	61	115	87	60	25.0	16.4	24.0				
<i>Nyctinomus musculus.</i>	ElGuama.	103775	do	81	28.0	10.0	8.0	38.0	7.0	37	72	58	37							
Do	do	103776	do	85	29.0	10.4	8.4	40.0	6.8	38	75	58	39							
Do	do	103777	do	86	31.0	11.0	8.0	39.0	6.6	37	71	54	37							
Do	do	103778	Female	86	34.0	12.0	8.8	39.0	6.6	37	70	55	38							
Do	do	103779	do	89	33.0	12.0	8.6	38.0	7.0	36	70	54	37							
Do	do	103771	do	86	30.0	10.4	7.0	38.0	6.4	37	72	59	39	16.0	11.4	16.0				
Do	do	103772	do	91	35.0	11.0	7.0	39.0	6.6	36	73	60	40	17.0	12.0	17.0				
Do	do	103773	Male	83	30.0	11.0	7.8	39.0	6.8	37	71	58	40	16.4	12.4	16.4				
Do	Pinar del Rio.	103774	do	87	31.0	12.0	7.0	39.0	6.0	36	73	60	39	16.0	12.0	16.0				
Do	Cabañas	103780	Female			13.0	8.4	38.6	6.0	36	68	55	39							

CHILONATALUS MICROPUS (Dobson).

1880. *Natalus micropus* DOBSON, Proc. Zool. Soc. London, p. 443; Environs of Kingston, Jamaica.

A single specimen (in alcohol) was taken at Baracoa. It is in bad condition, but there is no question as to its generic identity. For measurements see table, page 343.

Field notes.—This little bat, the only one of the kind that I found in Cuba, was captured in a butterfly net after dark on the evening of February 6, 1902, as it emerged from a cave in company with many other bats of other species. Its identity was not noticed at the time, and it was hurriedly placed, while yet alive, in a bag with other bats. Later it was found that one of the others, probably an *Artibeus*, had bitten its body in two. None of the people to whom I showed it had ever seen so small a bat.—W. PALMER.

NYCTIELLUS LEPIDUS (Gervais).

1838. *Vespertilio lepidus* GERVAIS, in La Sagra's Hist. Fisica. Politica y Natural de la Isla de Cuba, Pt. 2, III (Mamm.), p. 32; Cuba.

1855. *Nyctiellus lepidus* GERVAIS, Expéd. du Comte de Castelnau, Zool., Mamm., p. 84.

An adult female (skin and skull) was taken at Nueva Gerona, Isle of Pines, on July 11, 1900. For measurements, see table, page 343.

This specimen shows that the genus *Nyctiellus*, founded by Gervais for the reception of his *Vespertilio lepidus*, is distinct from *Natalus*, with which it is commonly united. *Nyctiellus lepidus* is a small bat about equal to *Pipistrellus hesperus* or *Thyroptera discifera* in size, though of more slender, delicate form than either of these. The legs are proportioned to the body about as in the two animals just mentioned, and therefore show none of the elongation characteristic of the posterior extremities in *Natalus*. The ear is small in size and simple in structure, closely resembling that of *Pipistrellus hesperus* in general outline, though somewhat shorter and broader. The anterior border of the ear conch arises directly over the eye, therefore slightly farther forward than in *Natalus*, and the posterior border terminates behind base of tragus instead of noticeably in front. As a result the ear opens outward with scarcely a trace of the peculiar funnel form noticeable in the other members of the family *Natalidae*. The tragus, however, appears to be much like that of *Natalus*. So far as can be determined from the dried specimen the lips are simple and there is no glandular outgrowth on forehead. Color, light raw-sienna throughout, the dorsal surface distinctly clouded with sepia.

Skull (Plate IX, fig. 2) essentially as in *Natalus*, but with brain case reduced in size and rostrum so greatly broadened that the lachrymal width is nearly equal to the width of brain case above roots of zygomatica. A suggestion of this broadening of the rostrum is found in *Natalus tumidirostris*, though in this animal the general proportions of the *Natalus* skull are not departed from. Dentition as in *Natalus*, but anterior premolar, both above and below, smaller than in any species of the genus with which I am acquainted. In the upper jaw this tooth is distinctly smaller than the outer incisor.

Field notes.—About a dozen were seen, late in the evenings, along the shore of the river at Nueva Gerona, Isle of Pines. This bat flies very low, about bushes, and close to buildings. Therefore, it is rarely seen for more than an instant as it rises against a light background. All efforts to shoot one were unsuccessful, but one was finally captured in a butterfly net as it was traversing the length of a porch.—W. PALMER.

CHILONYCTERIS BOOTHII Gundlach.

1861. *Chilonycteris boothii* GUNDLACH, Monatsber. k. Preuss. Akad. Wissensch. Berlin, p. 154; Fundador, Cuba.

1902. *Chilonycteris boothii* MILLER, Proc. Acad. Nat. Sci. Philadelphia, p. 401, September 12, 1902.

Four specimens (2 skins) from Baracoa. These, as I have recently pointed out, differ from the Jamaican *Chilonycteris parnellii* in the noticeably less crowding of the lower premolars. In the Jamaican animal the first lower premolar is in contact with the third and the

second is crowded quite out of the tooth row on lingual side. In *C. boothi* the first premolar is separated from the third by a distinct interval, in which lies the slightly displaced second. Otherwise the two species appear to be closely similar. For measurements see table, page 343.

Field notes.—Four specimens were obtained at the mouth of the cave near Baracoa, described under the next species. They did not emerge until well after dark, and none were captured while any trace of daylight remained.—W. PALMER.

CHILONYCTERIS MACLEAYII Gray.

1839. *Chilonycteris macleayii* GRAY, Ann. Nat. Hist., IV, p. 5, September, 1839; Cuba.

Eight (6 skins) from Guanajay and fifty (6 skins) from Baracoa.

In both series, as shown by the table of measurements (page 343), a larger and smaller form may be distinguished, the differences between which are fairly constant and quite independent of age and sex. Mr. Oldfield Thomas, who kindly compared some of Mr. Palmer's skins with the type in the British Museum, writes me that the name was originally based on a large specimen.

Field notes.—At Guanajay this was evidently a rare species. We found it in only one locality, a deep, damp cave in Guanajay Mountain, where it lived in company with thousands of *Phyllonycteris poeyi*. The white bat was somewhat readily captured with a dip net, and occasionally, but rarely, we secured a specimen of the smaller animal.

A few miles east of Baracoa, on a broad, well-wooded hill, is a hole in the porous limestone some 8 feet in diameter and 20 in depth. At the bottom, on one side, is the opening to a cave which extends an unknown distance, as I could find no one who had ever explored it. At the time of my visits, late on two afternoons, a slight column of mist was rising from the openings, showing that it was a damp cave similar to the one visited at Guanajay. Leading to the mouth of the cave is an irregular trough in the surface of the rock. This extends some distance back into the woods, and shows that the cave furnishes the natural drainage for the immediate region. The people living near knew of the existence of three kinds of bats in great abundance in this cave. Armed with an ordinary butterfly net, during two evenings I was able to secure no less than 142 bats, representing six species (*Chilonatalus micropus*, *Mormoops cinnamomea*, *Chilonycteris boothi*, *C. macleayii*, *Monophyllus cubanus*, and *Phyllonycteris poeyi*), as they emerged from the perpendicular opening. Before dark, while there was still light enough to see distinctly, the small *Chilonycteris* began to come out, at first singly or a few at a time, often hesitating and returning below again for another effort, then in greater num-

bers, and finally, as it became darker, in an almost continuous stream, so that with a few quick sweeps of the net it was possible to secure several specimens. At first no other species occurred with them, but as the gloom thickened and it became impossible to see the bats other kinds emerged and were captured by random strokes of the net.—W. PALMER.

Measurements of Chilonatalus, Nyctiellus, Chilonycteris, and Mormoops.

Name.	Locality.	Number.	Sex.	Total length.		Tail.	Tibia.	Foot.	Forearm.	First digit.	Second digit.	Third digit.	Fourth digit.	Fifth digit.	Ear from meatus.	Ear from crown.	Width of ear.
				mm	mm												
<i>Chilonatalus micropus.</i>	Baracoa...	113724	Female	.....	.....	.....	20.0	8.0	32.0	4.0	33	.....	.....	.....	14.0	11.4	15.0
<i>Nyctiellus lepidus.</i>	Nueva Gerona.	103898	do	66	27.0	13.0	6.0	29.6	4.0	25	47.0	35	35	10.0	8.0	9.0	
<i>Chilonycteris boothi.</i>	Baracoa...	113767	Male	83	22.0	20.0	10.0	52.4	7.0	44	87.0	68	66	23.0	18.0	14.0	
Do.....	do	113768	do	83	21.4	20.0	10.0	52.0	7.0	43	90.0	68	67	24.0	18.8	13.0	
Do.....	do	113769	do	78	21.0	19.8	11.0	51.6	8.0	45	87.0	67	66	.....	.....	.....
Do.....	do	113770	do	76	.....	19.8	11.0	52.0	7.0	45	92.0	66	63	.....	.....	.....
<i>Chilonycteris macleanii.</i>	Guanajay	103813	do	66	21.0	16.4	8.0	42.0	5.4	38	76.0	54	51	17.4	15.0	10.0	
Do.....	do	103814	do	70	22.0	16.0	9.0	41.6	6.0	38	74.0	53	52	18.0	15.0	10.0	
Do.....	do	103812	do	67	20.0	15.6	8.0	40.6	6.4	37	74.0	51	50	.....	.....	.....
Do.....	do	103820	do	.....	.....	15.0	8.4	37.0	6.4	33	66.0	45	44	.....	.....	.....
Do.....	do	103822	do	.....	.....	16.0	7.8	37.0	7.0	35	63.0	45	43	.....	.....	.....
Do.....	do	103823	do	.....	.....	17.0	8.0	37.0	6.4	34	62.0	44	42	.....	.....	.....
Do.....	Baracoa...	113777	Female	65	19.4	15.0	8.0	36.4	5.8	35	65.0	46	43	16.4	13.4	9.0	
Do.....	do	113778	do	65	19.0	15.0	7.0	37.0	5.8	34	64.0	46	43	16.0	13.0	9.0	
Do.....	do	113779	do	60	20.0	14.8	8.0	37.0	5.4	35	66.0	48	44	16.0	12.6	9.0	
Do.....	do	113784	do	63	19.6	16.0	7.8	38.0	5.6	34	63.0	45	44	16.0	12.0	8.8	
Do.....	do	113785	do	65	20.6	15.0	7.6	36.4	5.8	33	64.0	46	43	16.0	12.0	9.0	
Do.....	do	113780	Male	64	19.0	15.0	8.0	37.0	6.0	32	65.0	46	44	16.0	13.0	9.0	
Do.....	do	113781	do	67	21.0	15.6	8.2	38.0	6.4	36	67.0	50	46	17.0	13.0	9.0	
Do.....	do	113782	do	60	20.0	16.0	7.4	37.0	6.0	35	67.0	47	43	15.6	12.0	8.4	
Do.....	do	113783	do	64	19.0	15.0	7.8	36.6	6.0	33	67.6	48	43	16.4	13.0	7.8	
Do.....	do	113788	do	65	21.0	15.0	8.6	36.0	6.0	35	68.0	46	44	17.0	13.0	8.4	
Do.....	do	113786	Female	68	25.4	15.2	7.6	41.0	6.2	40	73.0	52	51	16.0	14.0	9.0	
Do.....	do	113797	do	74	23.0	16.6	8.6	43.0	6.0	39	76.0	53	51	17.4	11.0	9.0	
Do.....	do	113798	do	69	24.0	17.4	7.6	42.0	5.4	40	76.0	54	52	18.0	14.0	10.0	
Do.....	do	113799	do	68	24.0	16.0	8.0	42.4	5.0	39	73.0	54	52	18.0	14.0	9.6	
Do.....	do	113806	do	67	27.0	16.4	9.0	41.0	5.0	39	73.0	55	51	17.0	14.0	9.0	
Do.....	do	113791	Male	69	26.0	17.0	8.8	42.0	6.0	41	77.0	53	50	18.0	14.0	9.0	
Do.....	do	113795	do	65	23.0	17.0	7.0	42.0	5.4	38	73.0	52	50	19.0	15.0	10.0	
Do.....	do	113800	do	72	27.0	17.0	9.0	43.0	7.0	39	76.0	52	51	19.0	14.0	9.0	
Do.....	do	113801	do	68	27.0	17.0	9.0	42.4	6.0	40	74.0	53	51	18.0	14.6	10.0	
Do.....	do	113802	do	68	20.0	17.0	8.0	42.0	6.0	39	71.0	52	50	18.0	15.0	10.0	
<i>Mormoops cinnamomea.</i>	do	113762	do	78	30.0	19.0	8.6	45.0	6.4	41	84.0	61	55	.....	.....	.....
Do.....	do	113763	Female	75	27.0	19.0	9.0	41.0	6.0	43	86.0	61	54	.....	.....	.....
Do.....	do	113764	do	78	26.0	19.0	8.0	45.0	7.0	42	82.0	62	55	.....	.....	.....
Do.....	do	113765	do	82	32.0	19.0	9.0	44.0	6.0	43	86.0	63	58	10.0	8.0	11.0	
Do.....	do	113766	do	81	29.0	19.0	8.0	44.0	6.6	42	90.0	62	55	11.0	8.0	15.0	

MORMOOPS CINNAMOMEA (Gundlach).

1840. *L[obostoma] cinnamomeum* GUNDLACH, Wiegmann's Archiv für Naturgeschichte, 1840, I, p. 357; Cafetal St. Antonio el Fundador, Cuba.

1902. *Mormoops blainvillii cinnamomea* REHN, Proc. Acad. Nat. Sci. Philadelphia, p. 165. Issued June 11, 1902.

Five specimens (3 skins) from Baracoa. These have been recorded by Mr. Rehn in his recent revision of the genus *Mormoops*. I can see no necessity, however, for applying to this well marked form a trinomial name. For measurements see table above.

Field notes.—Among the 142 bats captured in two evenings at the mouth of the cave described in my account of *Chilonycteris macleayi* were five of this species. They were among the last to leave the cave as none were taken while it was light enough to see the orifice.—W. PALMER.

MACROTUS WATERHOUSII Gray.

1843. *Macrotus waterhousii* GRAY, Proc. Zool. Soc. London, p. 21; Haiti.

Eight specimens from the following localities: Guanajay, 3 (1 skin); El Cobre, 2 (1 skin); Nueva Gerona, Isle of Pines, 3 (2 skins).

In the absence of the material required for a revision of the West Indian forms of *Macrotus* the Cuban species may stand as *M. waterhousii*. The reasons for rejecting the generic name *Otopterus* have been given by Dr. F. W. True in Harrison Allen's Monograph of the Bats of North America (p. 33, March 14, 1894).

Field notes.—Two were driven out of a large cave, inhabited principally by *Artibeus*, on Guanajay Mountain, April 27, 1900, and captured in a dip net. While in the net one of these gave birth to a single young.

On the Isle of Pines a large cave was visited on the mountain side near Nueva Gerona, July 3, 1900. We were told that an abundance of bats had often been seen there, but all our efforts could frighten out only five, three of which were this species.

The only ones seen in eastern Cuba were captured in an old runway of a copper mine at El Cobre. They were with many individuals of *Artibeus*, and in the dim light of our lamps it was difficult to detect and capture the smaller species.—W. PALMER.

MONOPHYLLUS CUBANUS Miller.

1902. *Monophyllus cubanus* MILLER, Proc. Acad. Nat. Sci. Philadelphia, p. 410. Issued September 12, 1902; Baracoa, Cuba.

Fifty-six specimens were taken at Baracoa. For measurements see table, page 346.

Field notes.—This bat was abundant in the damp cave described under *Chilonycteris macleayi*. It was the second species to leave the cave, and in numbers was probably about equal to the *Chilonycteris*. It is a strong, muscular bat, and very hard to kill, especially when one is in a great hurry, as we were during our visits to the cave.—W. PALMER.

PHYLLONYCTERIS POEYI Gundlach.

1861. *Ph[yllonycteris] poeyi* GUNDLACH, Monatsber. k. Preuss. Akad. Wissensch. Berlin, (1860), p. 817; Cafetal St. Antonio el Fundador, Cuba.

Two hundred and twenty-six (74 skins) from a cave near Guanajay, four skulls found in owl pellets at El Guama, and twenty-six specimens (7 skins) from Baracoa. For measurements see table, page 346.

As may be seen from the figure (Plate IX) Gundlach's description of the noseleaf and calcar of this bat was correct. Dobson's suggestion that the type was mutilated^a is therefore quite unwarranted. Unfortunately *P. sezekorni* is still unrepresented in recent collections, though related forms are known from the Bahamas, Jamaica, Santo Domingo, and Porto Rico. No representative of *P. poeyi* has been taken outside of Cuba.

In color the skins are so uniform that the description of one will answer for the entire series. Fur everywhere grayish white, the hairs of crown and back distinctly washed with clay color at tip, those of the shoulders very slightly so; on under parts the wash is pale cream-buff, with a suggestion of ceru-drab. Ears and membranes light brown, the outermost phalanges and neighboring portion of membrane whitish. Throughout the pelage, but more particularly on the back, the hairs have a silky texture which produces silvery reflections in certain lights.

Field notes.—Very abundant in a wet, ill-ventilated cavern on Guanajay Mountain. On entering this cave, the vertical opening of which, about 12 feet across, was concealed by bushes, we descended about 25 feet, and were then standing some 20 feet above the lowest level. The slight noise which we made disturbed the bats in the inner chambers, and we could distinctly hear the rumbling made by their wings. As we proceeded this sound increased, until, when we reached the inner and thickly populated chambers, it became a grand, rushing, roar of thousands on thousands of wildly flying animals. To reach the inner chamber it was necessary for us to descend from the first landing to the real floor of the cavern, and there light our candles, for not a ray of light and very little fresh air penetrated so far. From the floor we worked our way over many guano-covered, damp bowlders and through arches and narrow passages up to a sloping shelf, where, owing to the low roof, a man could not stand upright. By this time the bad air and excessive warmth was telling on us, and we were in a most profuse perspiration. The bats were now thoroughly aroused, and the noise of their wings was astounding. Many were darting out through the passage by which we had entered. Placing our candles where they would be somewhat protected and partially blocking some of the openings with nets, we began swinging a dip net in every direction, trusting to chance to secure specimens. About fifteen minutes of such work usually resulted in the capture of 20 to 30 bats, nearly all of this species, and also in our complete exhaustion, our clothing soaked with perspiration and filth and our lungs scarcely able to breath in the foul air. By this time the bats would have passed into inner chambers and inaccessible recesses where very few could be followed and taken. Before June 7, all the females were big with a single young, but after this

^a Catal. Chiropt. Brit. Mus., 1878, p. 502.

date we found the pink, almost hairless little ones of different sizes hanging to the roof and scattered over much of its surface. On our last visit, late in June, the cave was so hot as to be unbearable. This bat was not seen at Pinar del Rio, but from pellets of the Cuban barn owl we procured several skulls.

Among the specimens captured at the mouth of the damp cave near Baracoa (described under *Chilonycteris macleanii*) were many of this species. It was among the last to leave the cave, and we were quite unable to see them as they emerged, depending on chance and rapid movements of the net to secure them. On one side of the vertical opening of this cave grew a large tree whose roots descended like a stream into the cavity. The people of the neighborhood assured me that the majas (the Cuban boa, *Epicrates angulifer*) coil themselves among these roots and grab at the bats as they fly out. I was told that a snake frequently secures a bat in this manner.—W. PALMER.

Measurements of *Monophyllus* and *Phyllonycteris*.

Name.	Locality.	Number.	Sex.	Total length.					Second digit.	Third digit.	Fourth digit.	Fifth digit.	Ear from meatus.		Width of ear.	
				Tail.	Tibia.	Foot.	Forearm.	First digit.					mm	mm		
<i>Monophyllus cubanus</i> .	Baracoa	113674	Male	67	8.0	16.0	11.0	38.6	11.0	35	80	57	50	13.0	11.4	7.6
Do	do	113681	do	72	9.0	17.0	11.0	40.0	10.4	36	84	60	55	13.6	11.0	8.0
Do	do	113683	do	67	9.0	17.0	10.4	40.0	11.0	34	81	60	54	14.0	11.0	9.0
Do	do	113685	do	72	8.0	16.0	9.0	39.0	9.0	36	80	57	51	14.0	11.0	10.0
Do	do	113686	do	64	8.0	16.6	10.0	39.4	10.6	37	74	56	51	14.4	10.0	8.6
Do	do	113689	do	70	10.0	17.0	10.4	40.0	9.8	37	84	62	53	14.6	11.0	9.0
Do	do	113692	do	64	8.0	17.0	10.0	40.0	10.4	35	85	62	54	14.0	10.0	9.6
Do	do	113693	do	69	10.0	16.0	11.0	38.0	10.4	36	81	57	50	14.0	11.0	9.6
Do	do	113679	Female.	72	9.0	17.0	11.0	39.0	9.6	35	81	57	51	13.0	11.0	10.0
Do	do	113687	do	69	10.0	17.6	10.0	38.0	9.4	36	77	55	49	14.0	11.4	10.0
Do	do	113688	do	67	9.0	17.0	10.0	40.0	10.0	37	78	57	51	16.0	11.6	10.0
Do	do	113690	do	67	16.0	10.0	38.0	8.0	34	76	53	48	14.6	12.0	10.0	
Do	do	113696	do	66	9.0	17.6	11.0	40.0	10.0	36	80	59	52	15.0	11.0	9.0
Do	do	113697	do	69	9.0	16.0	10.4	38.6	10.0	36	78	55	49	14.0	12.4	9.0
Do	do	113698	do	64	9.0	16.4	11.0	39.6	10.0	34	79	56	49	15.6	11.0	10.0
<i>Phyllonycteris poeyi</i> .	Guanajay.	103518	Male	82	9.0	27.0	15.0	47.0	13.0	38	84	65	64	20.4	15.0	12.0
Do	do	103519	do	84	9.0	24.0	15.0	46.6	12.0	36	82	62	62	19.4	14.0	12.0
Do	do	103531	do	79	11.0	26.0	15.0	47.0	13.0	38	84	65	64	19.0	13.6	12.0
Do	do	103532	do	80	12.0	25.4	15.0	47.0	13.0	36	83	65	64	19.8	15.0	12.6
Do	do	103533	do	87	12.4	24.0	16.0	45.4	13.0	36	79	63	64	19.0	15.0	12.6
Do	do	103534	do	80	10.0	25.4	15.0	45.0	12.6	37	76	63	63	19.0	14.0	11.0
Do	do	103536	do	83	11.4	24.6	14.0	46.0	11.6	34	79	64	63	18.0	13.0	11.0
Do	do	103438	Female.	81	13.0	25.0	15.0	47.0	13.0	32	78	63	64	19.0	15.0	12.0
Do	do	103450	do	80	12.0	25.0	15.0	49.0	13.0	33	83	68	66	19.0	15.0	12.0
Do	do	103452	do	75	10.0	24.6	13.6	46.6	12.4	36	78	62	62	18.0	14.0	12.0
Do	do	103455	do	80	12.0	25.4	15.6	49.0	12.0	37	81	65	67	19.0	15.0	11.0
Do	do	103456	do	80	12.0	22.6	13.6	46.0	12.4	32	77	60	58	17.8	13.0	11.6
Do	do	103457	do	80	11.0	22.4	15.0	45.0	12.0	34	76	61	61	18.4	14.0	12.2
Do	do	103458	do	82	12.0	25.0	14.6	46.0	11.0	36	76	61	62	18.0	14.0	11.6
Do	do	103461	do	79	9.0	25.0	14.6	47.0	11.0	38	68	64	63	18.4	14.6	11.8
Do	Baracoa	113727	Male	85	12.0	27.0	15.0	46.0	13.0	37	77	62	62	19.0	15.0	11.0
Do	do	113728	do	70	11.0	24.0	14.0	43.0	13.0	36	74	58	59	19.0	15.0	11.0
Do	do	113740	do	81	11.0	26.4	15.4	46.4	13.0	37	80	63	63	19.0	15.0	12.0
Do	do	113743	do	78	12.0	25.4	16.0	46.0	12.0	37	83	65	65	18.0	15.0	11.8
Do	do	113745	do	82	14.0	25.0	14.0	45.0	13.0	37	81	65	63	19.0	14.6	11.4
Do	do	113732	Female.	80	13.0	24.0	15.6	45.0	13.4	37	80	60	60	17.0	14.6	12.0
Do	do	113735	do	80	12.0	23.6	13.6	47.0	13.0	37	80	60	60	17.4	14.6	11.0
Do	do	113741	do	82	8.0	25.0	17.0	47.0	13.0	36	80	64	64	18.4	14.0	11.6
Do	do	113749	do	85	12.0	25.0	15.6	45.0	12.0	37	78	61	61	17.4	14.2	11.6
Do	do	113750	do	80	11.0	23.0	15.0	45.6	12.0	35	77	61	61	19.0	15.0	11.0

BRACHYPHYLLA NANA Miller.

1902. *Brachyphylla nana* MILLER, Proc. Acad. Nat. Sci. Philadelphia, p. 409. Issued September 12, 1902; El Guama, Cuba. (Skull.)
1902. *Brachyphylla nana* MILLER, Proc. Biol. Soc. Washington, XV, p. 249. December 16, 1902. (External characters.)

A single imperfect skull was found in an owl pellet procured at El Guama.

Field notes.—In a little valley at El Guama, among the mountains north of Pinar del Rio, is a rocky mass through which the waters of the valley once flowed, leaving now a large opening through which a man can readily walk. It is a favorite custom of the bats to fly through this opening, and a net placed there often entangled a specimen or two, though it failed to secure this species. A Cuban barn owl had its roosting place on a small shelf of rock, and on the ground beneath were many disgorged pellets. These contained the bones of several species of birds, numerous rats (*Mus alexandrinus*), and a few bats, among them a single skull of this species.—W. PALMER.

ARTIBEUS PARVIPES Rehn.

1902. *Artibeus parvipes* REHN, Proc. Acad. Nat. Sci. Philadelphia, 1902 p. 639. December 12, 1902; Santiago de Cuba.

One hundred and seventy specimens from the following localities: El Guama, 26 (14 skins); Pinar del Rio, 1; San Diego de los Baños, 17 (7 skins); Guanajay, 83 (32 skins); Mariel, 8 (4 skins); Nueva Gerona, Isle of Pines, 1; Baracoa, 11 (4 skins); El Cobre, 23 (3 skins).

The Jamaican material at hand is not sufficiently extensive to furnish a satisfactory basis for comparison of the Cuban specimens with true *Artibeus jamaicensis*, but I see no reason to question Mr. Rehn's conclusions. For measurements see table, page 348.

Field notes.—In western Cuba this is the commonest bat; found everywhere in the limestone caves of the mountains, where they can be seen hanging from the roof singly or in bunches. One was caught in a net placed over the edge of a tile roof at Pinar del Rio, where it had spent the day with many individuals of other species. These bats are also common in places remote from caves, as in the dilapidated warehouses at Mariel and Caloma, on the north and south coasts, respectively. Two were found in a cave on a mountain side on the Isle of Pines. We saw none of these bats roosting in trees, but they evidently capture much of their food among flowering trees, as their fur often contains pollen and parts of flowers. These are also found abundantly on the floors of caves where the bats roost.

In eastern Cuba *Artibeus parvipes* is common in all the arrier rock openings about Baracoa, but it does not occur in the damp cave

described under *Chilonycteris macleanii*. At El Cobre it is a common inhabitant of the old runways and shafts of the copper workings. It rarely emerges until after dark, but several were one evening seen to leave a cave on a hillside and return after a short trip abroad. Their flight is strong, and one often hears the rush of their wings as they swiftly curve by in the darkness.—W. PALMER.

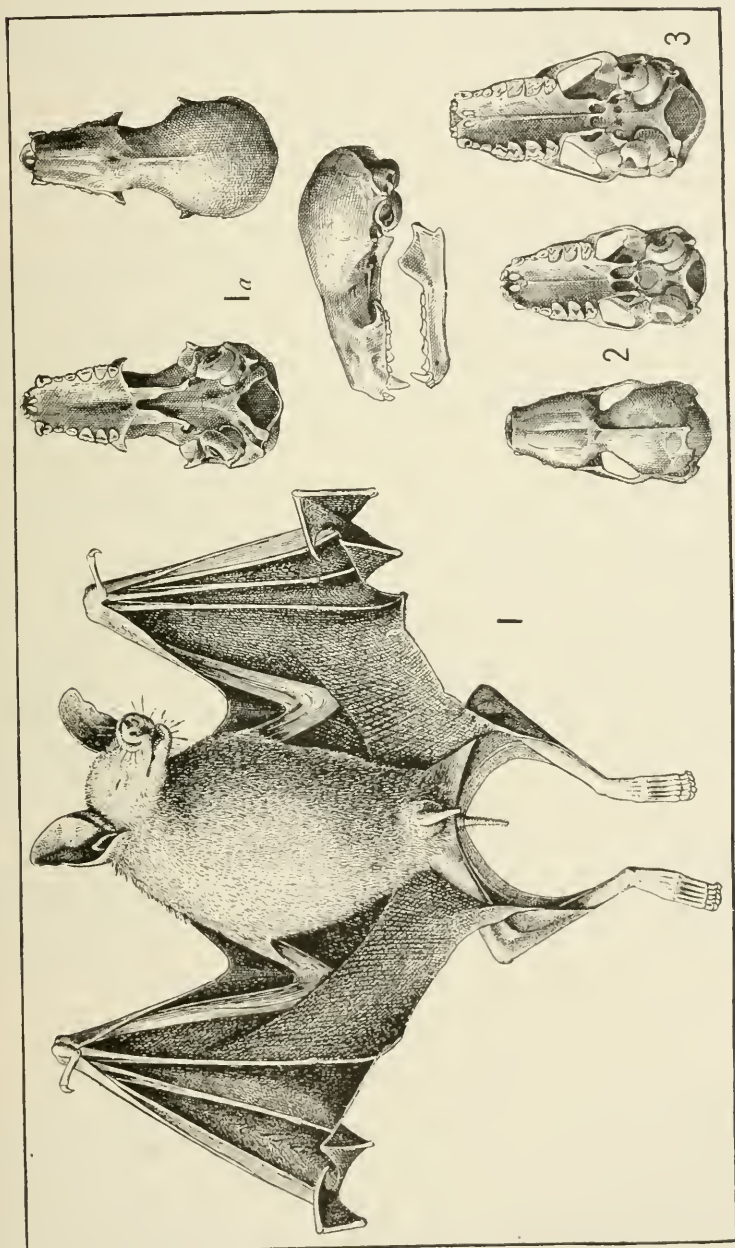
Measurements of *Artibeus parripes*.

Locality.	Number.	Sex.	Head and body.		Foot.	Forearm.	First digit.	Second digit.	Third digit.	Fourth digit.	Fifth digit.	Ear from meatus.	Ear from crown.	Width of ear.
			mm.	mm.										
Guanajay	103696	Female.	75	21.0	13.0	54.0	11.0	44	112	89	81	20.0	13.0	14.0
Do	103697	do	73	23.0	13.0	.....	13.0	48	117	86	79	21.0	14.0	14.6
Do	103699	do	75	21.0	13.0	53.0	13.0	44	110	82	76	20.6	14.6	13.0
Do	103713	do	78	22.4	15.0	57.0	12.6	50	125	95	87	21.0	14.0	14.0
Do	103714	do	70	23.0	14.0	55.0	13.0	47	114	88	79	19.0	13.0	14.0
Do	103715	do	71	21.0	14.0	54.0	12.0	46	116	88	80	20.0	15.0	14.0
Do	103716	do	76	22.6	15.0	57.0	13.0	46	117	90	82	21.0	14.0	14.0
Do	103717	do	73	23.4	14.0	55.0	12.0	47	116	88	83	21.0	16.0	14.0
Do	103698	Male	74	23.0	14.0	57.0	14.0	47	120	89	78	21.0	14.6	14.0
Do	103700	do	72	21.0	13.4	55.0	13.4	45	115	87	80	20.0	14.0	13.4
Do	103701	do	73	21.4	15.0	55.4	13.0	47	120	87	80	21.4	15.6	14.6
Do	103702	do	76	22.0	14.0	54.6	13.4	44	113	85	77	20.0	14.0	13.0
Do	103703	do	73	20.0	15.0	54.0	13.6	46	114	83	77	20.0	14.0	14.0
Do	103704	do	70	22.0	13.6	56.0	14.0	47	118	87	82	21.0	13.6	13.6
Do	103705	do	74	22.0	12.0	53.0	12.0	47	113	85	80	20.0	14.4	14.0
El Cobre	113821	Female.	76	20.4	13.0	53.0	14.0	47	116	87	80	21.0	15.0	14.0
Do	113822	do	76	21.4	13.4	55.0	14.4	46	114	83	79	20.0	15.0	14.0
Do	113825	do	75	20.4	13.6	53.0	13.0	45	112	82	78	20.4	14.0	12.4
Do	113828	do	76	23.0	13.0	58.0	15.4	47	120	90	86	22.0	14.0	13.0
Do	113829	do	78	21.4	14.4	55.0	13.0	47	117	85	80	21.4	15.0	13.6
Do	113823	Male	73	21.0	13.0	53.0	12.6	44	107	80	75	20.0	14.0	12.0
Do	113824	do	76	22.8	13.6	56.0	13.4	45	116	86	79	19.0	13.4	13.6
Do	113826	do	71	21.4	14.0	54.0	12.0	45	113	85	77	20.0	12.6	13.6
Do	113827	do	71	21.0	14.0	55.0	13.0	48	120	88	82	20.0	14.0	14.0
Do	113834	do	75	22.0	13.0	54.0	13.0	43	110	83	76	19.6	13.8	13.0

EXPLANATION OF PLATE.

FIG. 1. *Phyllonycteris poyei* Gundlach. Adult male, No. 103527, collected at Guanajay, Cuba.

- 1a. Skull of *Phyllonycteris poyei* Gundlach. Adult female, No. 103585, collected at Guanajay, Cuba.
2. Skull of *Nyctillus lepidus* (Gervais). Adult female, No. 103898, collected at Nueva Gerona, Isle of Pines.
3. Skull of *Natalus mexicanus* Miller. Adult female, No. 102509, collected at Morelos, Mexico.



SOME CUBAN BATS.

FOR EXPLANATION OF PLATE SEE PAGE 348.

