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MAMMALS OF AN EXPEDITION ACROSS NORTHERN PERU.

BY WILFRED H. OSGOOD.

The zoölogical work of the Field Museum in South America in 1912 was largely confined to northern Peru which was crossed from west to east by M. P. Anderson and myself during the months from January to September. Approximately 2,000 specimens of mammals and birds were collected including a gratifying number that fulfill in an important way the objects of the expedition.

Some of the larger mammals, as the Spectacled Bear and the White-lipped Peccary, already have been prepared for exhibition, while other material serves to complete the necessities for certain large habitat groups previously planned. The collection of mammals proves to contain sixteen species and subspecies new to science¹ as well as many species and no less than twelve genera new to Field Museum including some, as *Mesomys* and *Amorphochilus*, which may fairly be called great rarities.

The following account of the mammals obtained by the expedition has been abbreviated by circumstances which have made it necessary to omit certain illustrations and discussion of problems of geographic distribution. As a contribution to the scanty knowledge of the mammals of the region, however, it seems advisable to publish the list in its present form with introductory matter reduced to a brief description of localities.

Although somewhat less so than formerly, it is still necessary in classifying neotropical mammals to consult, either directly or vicariously, the collections of the British Museum. It is with the utmost gratitude, therefore, that I acknowledge the continued assistance of Mr. Oldfield Thomas who has made numerous comparisons for me with species not possessed by any American museum. Thanks are extended

¹ Nine of the new forms have been described in a preliminary paper (Field Mus. Nat. Hist., Pub. 168, Zool. Ser., X, pp. 93-100, May 31, 1913); a tenth was named in a monographic revision by G. S. Miller (Proc. U. S. Nat. Mus., XLVI, pp. 413-416, Dec. 31, 1913); and six are described in the present paper.

also for specimens borrowed from the American Museum of Natural History through Dr. J. A. Allen and from the U. S. National Museum through Mr. Gerrit S. Miller.

The route followed by the expedition was the so-called "Moyobamba route," over which no zoölogist had traveled previously, although the Polish naturalist Stolzmann had covered some parts of it about thirty years before. A preliminary trip was made during March into the mountains east of Trujillo in the vicinity of Otuzco after which the main journey was begun. We left the coast at Pacasmayo going by rail across the arid plain and thence proceeding with mules over the mountains by way of Cajamarca, Balsas, and Chachapoyas to Moyobamba. Thence to Balsapuerto we went on foot over a rough trail with Indian porters or *cargueros* carrying our collections and equipment. The remainder of the journey was by water, from Balsapuerto to Yurimaguas by canoe on the Paranapura River and from Yurimaguas down the Amazon by steamship.

The localities at which collections were made are as follows:

Menocucho, Feb. 21-Mch. 5. A small village at the terminus of a short railway line running eastward from Trujillo a distance of about 20 miles. The region is mostly arid and forbidding but along the banks of a small stream, the Moche River, there is considerable light growth of thorny bushes and small trees while near by are canefields and small gardens under irrigation. Altitude 900 ft. = ¹

Hacienda Llagueda, Mch. 8-Mch. 17. A large hacienda near the headwaters of the southern branch of the Chicama River, owned by Sr. Armas of Trujillo to whom, as well as to his eldest son Don Luis Armas, we were indebted for many favors. This place was reached by trail from Menocucho to Otuzco and thence across the divide separating Otuzco from the drainage of the Chicama. The hacienda occupies both sides of a very steep canyon traversed by a small swift stream. Although there is some open country, uncultivated vegetation is relatively profuse largely on account of fogs which constantly settle in the canyon. The cultivated crops are principally coffee and coca. Altitude 6,000 ft. =

Mountains near Otuzco, Mch. 19-20. The locality to which this phrase refers is near the top of the divide between Otuzco and the Chicama drainage but on the Chicama side overlooking the canyon of Llagueda. Altitude 10,000 ft. =

Trujillo, Mch. 25-26. Small collections made here are from thickets

¹ Altitudes are given on local authority or upon the basis of estimates, since it was our misfortune to lose our aneroid at the very outset.

and weed patches bordering irrigating ditches north of the city and within two miles. Sea level.

Pacasmayo, Mch. 29-Apr. 4. Small swamps and pastures near a permanent stream east of the town furnished a collecting ground. Elsewhere there is practically no sign of life. Sea level.

Cajamarca, Apr. 8-26. The city of Cajamarca is situated on the western edge of a broad, flat valley about 100 square miles in extent. The surrounding mountains are practically treeless and except along small trickling streams, of which there are a few, and about the haciendas, there is little vegetation. The bottom of the valley, which is crossed by one fair-sized stream, is cultivated and partly irrigated, the crops raised being principally alfalfa, barley, wheat, beans, and potatoes. Collecting was confined to the outskirts of the city and to a rather extensive swamp about three miles north. Altitude 9,200 ft.

Hacienda Limon, May 4-13. A hacienda about 10 miles west of Balsas owned and managed by Don Pedro Mejia y Burga. It is situated on one side of a hanging valley surrounded by mountains and sloping gently toward the Marañon. It is traversed by a shallow stream which leaves the valley through a small gap in the mountains at the lower end whence it drops suddenly and almost precipitously about 1,500 ft. to the Marañon River at Balsas. The valley is largely covered with low bushes or thin forest containing occasional trees of fair size. Sugar cane is the principal crop. Altitude 3,000 ft. =

Balsas, May 16. A small village on the Marañon River at the bottom of a deep enclosed canyon. The climate here is very hot and although certain types of vegetation are abundant the conditions are relatively arid. Altitude 1,000 ft. =

Tambo Carrizal, May 18. A dilapidated tambo on the side of the mountains directly east of and overlooking Balsas and the Marañon. A tiny spring here is surrounded by a clump of trees, mostly chirimoyas, and the steep slope below has some moderately extensive thickets of low bushes which the moisture from the spring permits to flourish. Elsewhere conditions are arid with occasional bunches of grass, cactuses, or small bushes. Altitude 5,000 ft. =

Mountains east of Balsas, May 19-23. This designation refers to a locality one day's travel beyond Tambo Carrizal at the edge of timberline and not far below the highest point between Balsas and Leimabamba. The camp was situated in an upward tongue of forest near the head of a small rushing stream. The place is known locally as Jenes. The mountains below are covered on both sides with relatively dense and heavy forest, the climate being more humid than in the

region to the westward. Above this forest was open grassy "jalca." Altitude 10,000 ft. =

Rio Utcubamba, May 26, 30. Small collections were made May 26 in a swampy mountain glade near the source of a western branch of the Utcubamba about six miles west of Leimabamba. Altitude 8,000 ft. =

Later, on May 30 a stop was made on the bank of the river about 15 miles above Chachapoyas. Altitude 7,500 ft. =

Chachapoyas, June 2-6. Chachapoyas is situated on an open, practically treeless plateau and although some of the neighboring canyons in the mountains are well wooded and apparently well watered, the immediate vicinity of the city is dry and unfavorable for much animal life. Altitude 7,700 ft.

Tambo Ventilla (or Ventija), June 13-19. A much frequented tambo in a mountain valley just below timberline near the source of the Huancachaca River which joins the Utcubamba below Chachapoyas. It is about 10 miles east of Molinopampa and perhaps 20 from Chachapoyas. The region is one of great humidity and relatively low temperatures. Altitude 10,000 ft. =

Tambo Almirante, June 22-24. A tambo situated approximately 40 miles east of Chachapoyas in a small clearing in dense humid forest on the east slope of the high cordillera between Chachapoyas and Moyobamba. The telegraph station of Uchco is situated some six miles below. Altitude 5,000 ft. =

Poco Tambo, June 28-29. A tambo near which are a few small farms surrounded by heavily forested mountains one short day's travel beyond Tambo Almirante. This is near the foot of the Andes and a few miles beyond is the so-called "Bajada de la Ventana" from the top of which one looks over an apparently limitless plain. Altitude 4,000 ft.

Tambo Yaku, July 1-6. A well known tambo on the relatively level plain about 30 miles west of Moyobamba. It is situated at the edge of heavy forest but the vicinity is characterized by large open grassy campos alternating with irregular light forest of small trees and bushes with many heavy growths of brake ferns and club mosses. The village of Rioja is some eight miles to the eastward. Altitude 3,000 ft. =

Moyobamba, July 10-Aug. 11. Moyobamba is situated on a bench just above the bank of the Moyobamba River which at this point is navigable for launches and light draft boats although communication with the Huallaga is broken by rapids farther down stream. The surrounding plain is but slightly broken and the forest is mostly light and bushy with frequent clearings not all of which are artificial. Never-

theless, a rough hilly country separates Moyobamba from Balsapuerto. The climate is warm but not typically tropical and the nights are always delightfully cool. Work here was done chiefly about the flats along the river and in some rather heavy moist forest near the thermal springs a few miles west of the town. Altitude 2,800 ft. =

Balsapuerto, Aug. 19. The hills and mountains are definitely left behind at Balsapuerto. Within a few miles to the westward is mountainous country and distant outlying hills may be seen elsewhere, but in general the region is a flat forested plain. Altitude 700 ft.

Yurimaguas, Aug. 25–Oct. 5. Yurimaguas, situated on the Huallaga River at the mouth of the Paranapura, is well within the Amazonian plain wholly surrounded by unbroken forest. Mr. Anderson collected at three localities within a few miles of the town: Munichis, a small Indian village several miles west; Yane Yaku, a chacra or farm on the Paranapura River about 8 miles from Yurimaguas; and Puerto Arturo, a small place a few miles below Yurimaguas on the Huallaga River. Altitude 600 ft.

Lagunas, Oct. 10–20. A small village on the east bank of the Huallaga River not far above the junction of the Marañon and the Huallaga. It is in the heavily forested rubber district. Collections from this locality were made only by Mr. Anderson. Altitude 500 ft.

Nazareth, Sept. 10. A village at the edge of a rubber forest on the Yavari River some 20 miles above its mouth and opposite the Brazilian village of Remate de Males.

Peramys peruvianus Osgood. PERUVIAN PERAMYS.

Two specimens, Moyobamba.

These were caught in mouse traps in relatively open forest where the undergrowth was limited. Unfortunately, both were attacked and badly mutilated by ants while in the traps. The skin of the type, however, lacks only part of the tail, ears, and feet and therefore sufficiently shows the coloration. The other specimen was preserved in alcohol. This is one of the smaller species of *Peramys* and appears very distinct from any previously described.

Didelphis marsupialis Linnæus. LINNÆAN OPOSSUM.

Two specimens: Moyobamba (1), Yurimaguas (1).

One of these is in the light and the other in the dark phase and both agree in color with corresponding specimens from northeastern Brazil representing typical *D. marsupialis*. The skull of the larger specimen,

from Yurimaguas, has unusually large teeth and certain cranial peculiarities, which, if borne out by a series of specimens, might be regarded as of subspecific importance. In the absence of any such series, the range of typical *marsupialis*, heretofore including only Guiana and Venezuela,¹ may be regarded as greatly extended to include also the whole of northern Brazil to the base of the Andes.

Didelphis marsupialis etensis Allen. ETEN OPOSSUM.

Three specimens: Menocucho (2), Hda. Llagueda (1).

Opossums are generally distributed through the suitable parts of the coast region of Peru, being found in greatest abundance near cultivated areas where they find their favorite fruits more easily obtainable than in wilder parts. Local name *Ouron*.

Didelphis paraguayensis andina Allen. ANDEAN OPOSSUM.

Eight specimens: Hacienda Limon, near Balsas (3 ad. 4 yg.), Rio Utcubamba, 15 miles above Chachapoyas (1).

Two of the adult specimens are more richly colored than descriptions indicate as usual for *D. p. andina*, but in the absence of material for comparison it is not possible to determine whether or not this has particular significance.

Wild fruits, particularly figs, chirimoyas, and grenadillas, were especially abundant in the vicinity of Hacienda Limon furnishing a plentiful and most acceptable supply of food for the opossums. Partly eaten chirimoyas and empty shells of grenadillas were scattered about the ground under the trees in many places. One evening, while we were encamped under a large wild fig tree, partly eaten fruits began to fall into our midst at short intervals, even striking us on the head. The guilty opossum was caught that night near the foot of the tree. The local name *Ouron* in use for opossums on the coast of Peru is replaced in the interior by *Kangaluc*.

Metachirus canus Osgood.

One specimen, the type from Moyobamba, was the only one obtained. This was brought to us by a small boy who said it had been captured in one of the numerous small groves of plantains in the village.

The close relationship of this species to *M. griseus* is evident and the two may be expected to intergrade.

¹ Cf. Allen, Bull. Am. Mus. Nat. Hist., XVI, pp. 257-259, 1902.

Metachirus andersoni Osgood.

Three specimens were obtained by Mr. Anderson near the Parana-pura River about eight miles from Yurimaguas. As indicated by its dark rich coloration, the species inhabits heavy forest.

Metachirus nudicaudatus tschudii Allen.

One specimen, an immature female, was caught in a banana grove in Moyobamba. It is much darker above than an adult from Chan-chamayo, Peru, but the under parts are more whitish. A dark blackish line runs from the forehead to the middle of the back and less distinctly thence to the base of the tail. It may be referred to *M. tschudii* of Allen since it agrees closely with the description of that form and has the blackish median line well marked. This character, however, may be a mark of immaturity.

Marmosa impavida (Tschudi).

Three specimens, Yurimaguas.

The long narrow skull of this species with its slightly beaded and nearly parallel-sided supraorbital edges is very distinctive, but for greater certainty a specimen was submitted to Mr. Thomas who confirmed the identification. In size and color of upper parts, *M. impavida* is not greatly different from *M. musicola* but cranially there are marked distinctions. There is some variation in the color of the under parts, one specimen having the entire lower surface creamy buff to the roots of the hairs, while the other two have a lateral area in which the hairs have slaty bases as described for *impavida*.

Marmosa madescens Osgood.

Four specimens: Tambo Almirante, near Uchco (1), Poco Tambo (1), Tambo Ventija, near Molinopampa (1), Moyobamba (1).

This pretty little opossum inhabits the densest forests of the upper montagna occupying a belt extending from 2,500 feet altitude up to 8,000 feet. Its range appears to meet that of *M. musicola* at Moyobamba where both species were taken but their local habitats are different, that of *madescens* being the forest and that of *musicola* the open fields and cultivated areas. *M. madescens* is the darkest *Marmosa* known to me. Apparently the only species that approach it in this respect are *M. fuscata* of the Sierra de Merida, *M. phæa* of S. W. Colombia, and *M. sobrina* of Ecuador. Judged by the description, *M. sobrina* is somewhat doubtfully distinct from *madescens*.

Marmosa musicola Osgood.

Five specimens, Moyobamba.

This species, which is of a common cinnamon type of coloration, was found only in the gardens and about the houses in the town of Moyobamba. So far as indicated by material at hand, it is somewhat similar to *Marmosa quichua* from which it is amply distinguished by its well-developed angular postorbital processes. Although presenting larger dimensions, it may be allied also to *M. lepida*, a species we were not fortunate enough to obtain although its type locality, Santa Cruz, is but a short distance from Lagunas where Mr. Anderson worked for nearly two weeks.

Marmosa waterhousei Tomes.

Didelphys waterhousei Tomes, Proc. Zool. Soc., Lond., pp. 58, 271, 303, pl. LXXVI, 1860 — Gualaquizar, Ecuador.

Didelphys cinerea Thomas, Cat. Marsupialia Brit. Mus., p. 342, 1888.

Marmosa germana Thomas, Ann. & Mag. Nat. Hist., (7), XIII, p. 143, Feb., 1904 — Sarayacu, Ecuador.

Two specimens: Moyobamba (1), Yurimaguas (1).

These were obtained in gardens among the plantains. Neither of them shows any white on the tail. The species is closely allied to *M. cinerea* and probably will prove to be only subspecifically separable from it. Both the original description and the accompanying colored figure of *Marmosa waterhousei* indicate that *M. germana*, later described from a neighboring locality, is a synonym.

Chironectes minimus (Zimm.). WATER OPOSSUM.

An adult female and a small young one were obtained at Moyobamba from a native who said he had killed them with his paddle at an early hour in the morning as he was crossing the river in a canoe. The skull of the adult shows rather marked differences from the figure published by Burmeister (Erlaut. Fauna Bras., pl. XI, fig. 3, 1856), especially in the shape of the nasals. Burmeister's specimen doubtless came from southeastern Brazil ("Neu-Freiburg") and it is scarcely safe to assume that it represents true *minimus* of which the type locality is Cayenne.

Bradypus sp. THREE-TOED SLOTH.

An adult female secured by Mr. Anderson from a native at Yurimaguas is in the collection. The legs, back, and especially the rump

are heavily and almost symmetrically marked with white, the remainder of the pelage being drabish brown, paler on the under parts. The face has the usual white frontal marking and the blackish streak crossing the eye. The chin and throat have numerous hairs broadly tipped with chestnut. The skull differs in many respects from that of *tridactyla* from Guiana and there can be no question of its distinctness. Whether it should be given a new name or not can be determined only by examination of various old types most of which are in European museums and lacking in exact data. Gray's name *blainvillei* has been used for specimens from the Ucayali River¹ probably representing the species to which our specimen belongs, but as the original basis of the name was a skull without definite locality, there is no certainty in its use at present.

Tayassu pecari Fischer. WHITE-LIPPED PECCARY.

Two specimens, Tambo Almirante.

Peccaries range through the heavy forest of the east slope of the eastern cordillera up to an altitude of 6,000 ft. or more. The natives carrying freight between Chachapoyas and Moyobamba generally have with them old fashioned guns mainly in the hope that they may encounter a herd of these animals the flesh of which they highly prize. Perhaps for this reason, we saw but few tracks near the main trail.

Returning to camp one morning during a heavy downpour of rain, I heard a faint sound from a wooded quebrada some distance below me and was just concluding it to be the note of some unknown bird less distant, when a breath of wind brought it more clearly to my ears and I recognized a squealing, piglike quality in it. Going a little nearer, I was no longer in doubt and following the sound, soon worked my way through heavy timber and thick underbrush to the edge of a sharp cut bank which dropped some thirty feet down to the bottom of the practically waterless quebrada. The growling, squealing din was then just below me and added to it was the lively click of snapping tusks — apparently only a family quarrel, but being waged with considerable vigor. For a few seconds I could see nothing but an occasional waving bush. Then I gradually made out the dark bodies of several peccaries moving about on the other side and near the bottom of the quebrada. They were difficult to see since there was a heavy growth of large brake ferns under which they were passing and in the deep shade their blackish bodies gave little contrast to the ground. Picking out two of the largest ones, I dropped them in their tracks and was just aiming at a

¹ Gray, Handlist Edentate, Thick-skinned, and Ruminant Mammals, p. 4, 1873.

third when a wee little one came into the clear and distracted my attention standing on a small flat rock directly below me and whining plaintively. Meanwhile there was much scurrying in the underbrush and the squealing abruptly stopped. Suddenly a half-dozen good-sized ones came up my side of the bank and broke through the bushes not fifteen feet away, making directly toward me. While I hurriedly jammed in fresh cartridges, they took one look at me and immediately veered into cover, evidently having no idea of attacking. The herd numbered about twenty and of these a considerable proportion were not full grown.

The two killed were male and female, adult, but not old and among those indistinctly seen was one apparently somewhat larger. I estimated their weight to be 60 to 75 pounds. The measurements of the fresh specimens are as follows: Total length 1,185, 1,100; height at shoulder 590, 565; circumference of chest 750, 710; shoulder to hip 570, 530; hind foot 235, 220. They had scarcely any fat on them and their skins were thin and easily removed. The meat, which is highly regarded by the natives, was not especially well-flavored and reminded of young venison.

These peccaries, living in the cool rain forests of the eastern slopes of the Andes, are certainly subjected to climatic conditions quite different from those of eastern Brazil and the Amazon valley, but their general characters are not peculiar and material is not available to determine how far they may be distinguished by combinations of slight characters.

Mazama americana (Erxleben).* RED BROCKET.

Two adults, male and female, were obtained at Moyobamba from a native who killed them in late twilight as they came to the edge of his cornfield. Tracks seen near Tambo Yaku probably were of this species and it may range upward to an elevation of four to five thousand feet.

Material from eastern Brazil and Guiana is lacking, but as judged by descriptions, the Peruvian specimens do not differ from typical *americana* in any obvious respect.

Odocoileus peruvianus (Gray). PERUVIAN WHITE-TAILED DEER.

One imperfect skull of a young male with permanent dentition was obtained at Menocucho. Although the animals were not uncommon,

* *M. rufus* of authors; see Thomas, Ann. & Mag. Nat. Hist., (8), XI, p. 585, June, 1913.

efforts to secure complete specimens were not successful. In the immediate vicinity of Menocucho, deer were not abundant since considerable hunting had been done previous to our arrival. They frequent the canefields and are usually hunted with dogs and killed as they break cover to pass from one field to another or to cross one of the open lanes by which each field is subdivided. Deer belonging to this species evidently occur throughout the western ranges of Peru. Tracks were seen at Hacienda Llagueda, in the vicinity of Otuzco, and at Hacienda Limon near the Marañon River. West of the Marañon, tracks were noted occasionally but whether these were of the same species or not is doubtful. At Llagueda a young buck was seen late one evening, as we were returning from an all day's hunt, and but for a fractious saddle mule which backed off the steep side of the trail at a critical moment, a specimen might have been secured.

Cervus brachyceros Philippi (= *Odocoileus philippii* Trouessart) was based on specimens from this part of Peru and probably is a synonym of *O. peruvianus*. Philippi calls it the "Venado de Cajamarca" and distinctly implies a Peruvian origin for it.

Hippocamelus antisiensis (d'Orbigny). PERUVIAN GUEMAL.

The guemal or *taruga*, as it is called in this part of Peru, was not encountered by our party. So far as learned from inquiry, it never has been common in the region and it was only at rare intervals that we met a man who ever had seen one. A few doubtless remain in the higher parts of both the western and the eastern cordillera but at the points we were able to touch not even a track was found.

Sciurus cocalis Thomas.

Two specimens, Yurimaguas.

Although rather more blackish than the type of this species as described by Thomas, these specimens otherwise agree in such detail that there can be little doubt of their identity. Their occurrence at the same locality with *S. tricolor* is the same condition found by Mr. Goodfellow on the Napo River in Ecuador. Evidently they range together over a considerable territory and do not merely overlap, as supposed by Thomas. This is the more interesting since they have so many superficial similarities. In external dimensions, they are practically identical, and each is somewhat variable in color, but certain

constant characters separate them beyond dispute without considering the very marked cranial differences.

Sciurus tricolor Pöppig.

Two specimens: Lagunas, Lower Huallaga River (1), Puerto Arturo, near Yurimaguas (1).

These specimens, especially the one from Lagunas, come from very near Pöppig's type locality. They show an important variation in the color of the under parts, one being white throughout, except on the chin, and the other wholly rich orange rufous. The skulls, as noted by Thomas,* have very long narrow muzzles. This is accompanied by a greatly compressed mandible and extraordinarily broad thin lower incisors. These measure 5.5 mm. in depth and 24 mm. in length of exposed front surface, dimensions which exceed those of any other squirrel known to me.

Mus musculus Linnæus. HOUSE MOUSE.

House mice are common in and about the coast towns. Two specimens from Pacasmayo were preserved.

Epimys alexandrinus (Geoffroy). ROOF RAT.

After sporadic and poorly executed attempts to destroy them, rats are still abundant in the coast towns of Salaverry, Trujillo, and Pacasmayo. The feeling that they are dangerous to the health of the community is growing, however, and the more intelligent people are more and more inclined to make some effort to prevent their spread and increase. Apparently they have not penetrated far into the highlands, for we received no reports of them after leaving the coast until we reached Yurimaguas, where we again found them numerous.

Oryzomys stolzmanni Thomas. STOLZMANN'S ORYZOMYS.

Forty-one specimens: Mountains east of Balsas (1), Tambo Almirante, near Uchco (8), Moyobamba (32).

Huambo, the type locality of *Oryzomys stolzmanni*, is less than 50 miles directly south of Tambo Almirante, on the same slope of the mountains, and at nearly the same altitude. Moreover, the local conditions are much alike at the two places, the forest dense, and the

* Ann. & Mag. Nat. Hist. (7), VI, p. 138, July, 1900.

climate humid.* The probability is great, therefore, that our specimens from Tambo Almirante represent true *O. stolzmanni*, and since the type is imperfect and not fairly comparable with modern specimens, it becomes practically necessary to regard them as that species. A large series from Moyobamba seems referable to the same species, although averaging paler and including some specimens with somewhat whitish under parts. This paleness is perhaps ontogenetic and may be due to the fact that nearly all the specimens from Moyobamba were taken about houses and gardens in the town rather than in the adjoining forest. The published measurements of the type of *stolzmanni* indicate an animal slightly larger than the average in our series, but there is at least one unusually large example among those from Moyobamba which nearly equals it.

The specimens from Tambo Almirante have clear ochraceous buff under parts, lighter toward the chin. The upper parts are somewhat darker and with many fine lines of dusky. Average measurements of four adults are: Total length 214 (205-224); head and body 94 (91-96); tail 120 (111-128); hind foot 23.9 (23.5-24.5).

***Oryzomys stolzmanni maranonicus* subsp. nov.**

Type from Hacienda Limon, near Balsas, Marañon River, Peru. No. 19449 Field Museum of Natural History. Male adult. Collected May 7, 1912, by W. H. Osgood and M. P. Anderson.

Characters.— Similar to *Oryzomys stolzmanni* but paler and having nearly white under parts sharply distinguished from the upper parts. Ground color of upper parts nearly ochraceous with a fine linear mixture of dusky; sides more nearly pure ochraceous; head and face scarcely different from body; under parts soiled whitish, sharply defined, the hairs with slaty bases; feet white; tail above dusky, below whitish for the proximal half, and thence gradually darker to the tip.

Skull practically as in *stolzmanni*, although in the type the braincase is deeper and more arched.

Measurements.— *Type*: Total length 215; head and body 92; tail 123; hind foot 24; ear from notch (dry) 14. Skull of type: Basilar length 17.4; zygomatic width 12.6; interorbital constriction 3.8; width

*The following description of Huambo, from Stolzmann's notes, is given by Taczanowski (P. Z. S., p. 4, 1882): "*Huambo*. 3,700 pieds de altitude. Plantation inhabitée au fond de la forêt vierge, à 10 kilometres de Chirimoto, au bord de la rivière Huambo, qui, comme on le pretend, se rend près de Pachiza au fleuve de Huallaga. C'est une forêt chaude et humide, du caractère des forêts vierges."

of braincase 11.4; post-palatal length 7.1; palatine foramina 4.4 x 1.7; upper tooththrow 3.7.

Remarks.— This form has approximately the color of *O. arenalis* with the size and cranial characters of *O. stolzmanni*.

Oryzomys arenalis Thomas. DESERT ORYZOMYS.

Twenty-three specimens: Menocucho (9), Pacasmayo (11), Trujillo (3).

This is one of the smallest known species of *Oryzomys*. It should be compared with *Oryzomys peruvianus* (Peale) from Callao when specimens of that species are obtained. It was found in relatively moist situations at the edge of small swamps or irrigating ditches.

Oryzomys andinus sp. nov.

Type from Hacienda Llagueda, upper Rio Chicama, Peru. Altitude 6,000 ft. No. 19430 Field Museum of Natural History. Male adult. Collected March 12, 1912, by W. H. Osgood and M. P. Anderson. Orig. No. 4525.

Characters.— A medium-sized *Oryzomys* allied to *O. stolzmanni*, but having a much larger foot and a very long tail. Coloration of the normal oryzomyine type; upper parts pale ochraceous darkened by numerous fine dusky lines; a slight ochraceous lateral line; face and head somewhat grayish; under parts creamy white, sharply differentiated, the hairs with slaty bases; ears thinly haired with ochraceous basally and internally, with brownish distally and externally; feet white; tail thinly clothed with very short hairs, brownish above, whitish below for proximal half, gradually becoming dusky toward the tip. Skull similar in general form to that of *O. stolzmanni* but relatively narrower and with smaller teeth and audital bullæ; palatine foramina much compressed; braincase angled and truncate rather than rounded behind; interorbital region and base of nasals slightly concave between sharply angled edges.

Measurements.— Type: Total length 253; head and body 104; tail 149; hind foot 26; ear from notch (dry) 16. Skull of type: Greatest length 26.4; basilar length 20; zygomatic breadth 14; mastoid breadth 11; interorbital constriction 3.8; nasals 10 x 2.8; palatine foramina 4.8 x 1.4; diastema 6.7; width of infraorbital plate 2.6; upper tooththrow 3.4.

Remarks.— If, as seems highly probable, specimens from Moyobamba and Tambo Almirante represent typical *O. stolzmanni*, it is plain

that the above-described species requires a name. It inhabits a wholly different region on the west slope separated from the eastern montagna by practically the entire Andean chain. So far as known, it needs comparison only with *O. stolzmanni*, from which its large feet and ears, its very long tail, and its paler under parts at once distinguish it.

***Oryzomys xanthæolus* Thomas.**

Thirty-four specimens: Balsas, Marañon River (1), Hacienda Limon, near Balsas (5), Pacasmayo (7), Menocucho (13), Trujillo (8).

This rat was common at all localities on the coast where collecting was done. It lives in thickets and weed patches along streams and irrigating ditches. With the exception of *Akodon*, rodents were very scarce in the bottom of the Marañon canyon, and the specimens of this species obtained there are mostly immature and not satisfactorily distinguishable from the typical form of the coast region. Their under parts average more nearly white, but this is a variable feature. The climatic conditions at Balsas are not greatly different from those of the coast, the temperature averaging high and the rainfall being slight. A number of birds and plants not found in the directly intervening country are common to the two regions. Possibly certain points to the northward afford opportunity for the continuous distribution of these and of *O. xanthæolus*. *Oryzomys baroni* from Cajabamba (8,000 ft.) is a very closely related form, at most a highland representative of *xanthæolus*. It was not taken at Cajamarca nor in the Otuzco region, localities more or less flanking Cajabamba and of similar elevation, but collecting conditions are such in these places that it might easily have been missed. It is even possible that *O. baroni* may prove indistinguishable from *xanthæolus*, in which case there would be nothing anomalous in its occurrence in the Marañon valley. The type of *baroni* and one topotype loaned by the American Museum of Natural History through Mr. R. C. Andrews show no important external characters when compared with series of *xanthæolus* from the coast. The skull of the topotype, which is adult with teeth beginning to wear, can be duplicated among coast specimens; but that of the type, a very old female with the crowns of the teeth practically worn away, differs from the coast specimens of similar age in greater size and in rostrum and nasals so much heavier and wider that individual variation cannot safely be taken as a sufficient explanation. Such close relationship, especially in the unwieldy and slightly understood genus *Oryzomys*, seems best indicated by the trinomial *Oryzomys xanthæolus baroni*.

Oryzomys minutus (Tomes). PIGMY ORYZOMYS.

Two specimens, Mountains northeast of Otuzco, near head of Rio Chicama. Altitude 10,000 feet.

These are practically indistinguishable from specimens from the south side of Mt. Pichincha, Ecuador, which may be regarded as probably typical of *O. minutus*. They differ from *O. dryas* mainly in color, being much duller and more grayish above, paler below, and with the ears less blackish, and therefore in less contrast with the surrounding parts. In cranial characters they are closely related only to *O. dryas* and differ from *O. stolzmanni* and allies in having more delicately formed skulls, with very small teeth, a non-projecting zygomatic plate, and a full rounded relatively broad braincase. Whether these characters can be detected in the immature type of *O. minutus* will doubtless remain uncertain until the type can be carefully compared with an ample amount of pertinent material.

Oryzomys dryas Thomas.

Nine specimens: Mountains east of Balsas (3), Tambo Almirante, near Uchco (1), Tambo Ventija, near Molinopampa (5).

These small mice were taken in dense forest where there was great humidity but no very high temperature. In the flesh, they present a very characteristic appearance, somewhat different from the normal "pigmy *Oryzomys*" and resemble rather some of the full-furred *Reithrodontomys* of southern Mexico and Central America. Their soft woolly pelage, richly ochraceous under parts, and sharply contrasted blackish ears amply distinguish them without reference to cranial characters. If not identical with typical *O. dryas* from Ecuador, their departure from it can only be very slight since they conform in every respect to the original description of the species.

The resemblance of this diminutive mouse both externally and cranially to certain species of *Rhipidomys* is noteworthy. Its slender hind foot and its laterally pitted palate are the only obvious objections to stating that it is an exact miniature, for example, of *R. fulviventer*. If it had been chosen as the type of *Oligoryzomys* instead of the typically oryzomyine *O. navus*, some slight grounds might be urged for the recognition of such a subgenus.

Oryzomys laticeps nitidus Thomas.

Twenty-two specimens: Lagunas (3), Moyobamba (11), Poco Tambo (1), Tambo Yaku, near Rioja (6), Yane Yaku, near Yurimaguas (1).

These mice live in dense forest, where they seem to be generally distributed but difficult to obtain in numbers. A line of one hundred carefully set traps in the forest seldom yielded more than two or three specimens. They are limited strictly to the montagna region and our westernmost record for them is Poco Tambo, where one specimen was taken at an elevation of about 4,000 ft.

They present a wide range of color variation, part of which evidently is due to age, for all the individuals of strongly fulvous color are of large size and fully mature. All mature specimens, however, are not of the fulvous type, and it seems probable that there is in this species a limited dichromatism. The length of the tail also is variable and, probably by coincidence, all fulvous specimens have exceptionally long tails.

Oryzomys albigularis (Tomes). WHITE-BREASTED ORYZOMYS.

Eleven specimens: Tambo Almirante, near Uchco (4), Tambo Ventija, near Molinopampa (5), Poco Tambo (2).

The habitat of this rat was found to be the heavy humid forest of the upper montagna from an altitude of about 5,000 ft. at least to 8,000 ft. Here it lives in the densest part of the forest under logs, roots, and débris. In the absence of actual topotypes, our small series may be regarded as representing true *albigularis*, the type of which came from Pallatanga, Ecuador. It is rather darker than any of the closely allied northern forms, the head being especially dark and the tendency to the development of a blackish dorsal area being pronounced. The under parts also are darker, and although some specimens have the white pectoral spot well developed, others, especially the younger ones, lack it entirely and have the whole under parts washed with fulvous. The skulls of the Peruvian specimens are so similar to those of *meridensis* that it is probable that form will eventually be regarded as a subspecies of *albigularis*. The same may be said of *maculiventer*, *pirrensis*, and *devius*. *O. childi*, *O. o'connelli*, and *O. pectoralis* apparently should be regarded as synonyms of *meridensis*. *O. keaysi* differs from *albigularis* more than any of the northern forms and intermediate specimens may not be forthcoming.

Oryzomys polius Osgood. GRAY ORYZOMYS.

Six specimens, Tambo Carrizal, mountains east of Balsas. Altitude about 5,000 ft.

This very distinct species, apparently unrelated to any previously known, is perhaps confined to the lower Marañon valley, like certain

birds and other animals, as, for example, the peculiar thrush *Planesticus maranonicus*. The discovery of such distinct types emphasizes the great imperfection of our knowledge not only of the causes but of the facts of vertebrate distribution in the Andes.

Owing to lack of horsefeed, it was not possible for us to stop at Tambo Carrizal more than one night, and we were fortunate in securing these rats in and about the old tambo itself.

Nectomys fulvinus Thomas. WATER RAT.

Six specimens: Lagunas (3), Yurimaguas (3).

For these very dark richly colored water rats the name *fulvinus* is perhaps as suitable as any other. Without typical specimens of *N. rattus* of the upper Rio Negro and without a definite type locality for *N. fulvinus*, nothing more than a provisional identification can be made. It is reasonably certain, however, that *N. fulvinus* was not from Quito, as thought possible when it was named, since another species, *N. saturatus*, inhabits that region. Our specimens from the Huallaga River increase the probability that *fulvinus* came from well east of Quito. There is considerable color resemblance to *N. melanius* of Guiana, a species not known at the time *fulvinus* was described, so perhaps Guiana as the source of *fulvinus*, a possibility originally dismissed, may need reconsideration.

Neacomys spinosus Thomas. SPINY MOUSE.

Four specimens: Moyobamba (1), Poco Tambo (2), Yurimaguas (1).

Apparently rather rare, this species was only obtained after much trapping in heavy humid forest, where it was found under rocks and logs. The color of the under parts varies from nearly pure white to ochraceous buff, and the belly hairs in some specimens are white to the roots and in others with slaty bases of varying width.

Rhipidomys latimanus Tomes.

Two specimens from Moyobamba are referred to *R. latimanus* by Mr. Thomas. They were obtained in houses in the town. The color is much paler than usual in this genus, the upper parts being a light wood brown tinged with fawn. The type of this species is credited to Pallatanga, in western Ecuador, a locality rather removed from Moyobamba, and it is possible that the original describer may have been misinformed regarding the source.

Rhipidomys fulviventor Thomas. BUFF-BELLIED VESPER RAT.

Five specimens: Mountains east of Balsas at 10,000 ft. (1), 10 miles east of Molinopampa (1), Rio Utcubamba, between Leimabamba and Chachapoyas (1), Tambo Almirante, near Uchco (2).

There is some slight variation in this small series, probably due mostly to age and condition of pelage. Specimens submitted to Mr. Thomas are pronounced almost identical with the type.

Oecomys bicolor (Tomes).

One specimen, Tambo Yaku, near Rioja.

Thomasomys prætor Thomas.

Two specimens: Mountains near Otuzco (1), Hacienda Limon (1).

Although one of these was taken at the edge of timberline and the other well down on the side of the Marañon canyon, they seem to belong to the same species. So far as known to me, they are the only specimens of this species preserved except the type in the British Museum. Mr. Thomas has compared one of them with the type, finding only such differences as are likely to be due to disparity in age, the type not being fully mature. Except for a short hind foot, the description of *Thomasomys pyrrhonotus* agrees fairly well with our specimens.

Measurements of the adult are: Total length 387; head and body 187; tail 200; hind foot 38.

Thomasomys cinereus (Thomas.)

Twenty-three specimens, Mountains east of Balsas. Altitude about 10,000 ft.

The close agreement of these specimens with the original description and the fact that the locality is relatively near that of the type leaves scarcely any doubt of identity with *T. cinereus*, type species of the genus *Thomasomys*. Like its congeners, it inhabits the depths of dense humid forests. In the mountains where we found it, a heavy forest was not well established except in certain narrow canyons where fog and mist frequently settled while the surrounding peaks stood exposed to the sun. In such places, it ranges practically to timberline but never, so far as observed, beyond a growth of heavy moss, ferns, and rank vegetation only to be found in cool shade.

Adults and young differ but little in color and there is no great variation in the color of the upper parts throughout the series except

that due to wear, but the under parts range from dull gray to ochraceous buff. A grayish white spot at the base of the ear is usually evident. Average flesh measurements of ten adults are as follows: Total length 267 (258-284); head and body 134 (128-138); tail 133 (123-148); hind foot 30.2 (29-32).

Thomasomys cinereus ischyurus subsp. nov.

Type from Tambo Almirante, near Uchco, Peru. No. 19803 Field Museum of Natural History. Male adult. Collected June 23, 1912, by W. H. Osgood and M. P. Anderson.

Characters.— Similar to *Thomasomys cinereus* but larger, longer-tailed, and more richly colored; skull with a broader braincase, longer rostrum, and broader interorbital region. Upper parts rich vandyke brown or burnt umber finely sprinkled with sooty, the blackish slate undercolor scarcely showing through; under parts throughout heavily washed with the same deep fulvous brown but without sooty admixture and with the undercolor showing slightly; ears blackish, the hairs near their inner bases with marked whitish roots; fore and hind feet extensively brownish, decidedly more so than in *cinereus*; tail dull brownish above, scarcely lighter below.

Measurements.— Type: Total length 291; head and body 137; tail 154; hind foot 31. Average of six adults: 280 (266-292); 131 (124-137); 149 (140-160); 31. Skull of type: Greatest length 33; basilar length 25.5; zygomatic width 17.1; least interorbital width 6.4; nasals 13.9 x 3.8; interparietal 12.5 x 3.2; palatine foramina 6.7 x 2.3; upper tooth-row 5.1.

Remarks.— Nine of these rats were taken in the forest at Tambo Ventija and four others somewhat farther east and at less elevation at Tambo Almirante. Owing to their greater size in comparison with *T. cinereus*, they were at first thought to represent *T. kalinowskii*. But comparison with the type of that species kindly made by Mr. Thomas shows our specimens to be smaller with smaller narrower teeth and a broader interorbital region. Although well distinguished from *cinereus*, the new form shows such variation that it can scarcely be regarded as more than a subspecies.

An interesting character of this species, shown in less degree by certain others of the same and related genera, is the area of white-rooted hairs about the inner bases of the ears. These hairs are distinctly four-colored, the bases being nearly pure white followed broadly by blackish slate, then narrowly by fulvous brown, and apically by blackish.

The white is thus strongly contrasted but only visible in a prepared specimen on parting the long soft hair. In the living animal it could scarcely be visible under any normal circumstances, and therefore its *raison d'être*, if any, is probably involved in phylogeny.

The group represented by the name *Thomasomys* stands with sufficient distinctness among other South American groups but this distinctness is perhaps less important as a biological fact than the close similarity which exists between this group and the North American generic series *Peromyscus*. Under the limitations of present nomenclature, it is unfortunate that, while the slight distinction is recognized and emphasized, the great similarity is nomenclaturally neglected.

Akodon mollis Thomas.

Forty-six specimens: Menocucho (18), Pacasmayo (21), Trujillo (7).

This is the most common rodent in the irrigated areas of the coast region of northern Peru. It frequents rice and cane fields and the borders of streams and irrigating ditches, showing an obvious preference for moist situations. It is probably more abundant under the conditions of human occupation of the land than it would be in the absence of agricultural practice.

As a species, *Akodon mollis* has continuous distribution from the arid west coast up to an altitude of at least 12,000 feet and thence across the mountains and down into the upper part of the eastern forest or montagna. Speaking generally, there was no point on our route until we reached the Amazonian plain where we did not find some form of this species. Four well-marked subspecies are recognizable. Their more important characters may be summarized as follows:

Rostrum shorter and broader, zygomatic plate upright in front.

Pelage short; color paler *A. mollis*

Pelage long; color darker *A. m. altorum*

Rostrum longer and slenderer, zygomatic plate with receding front edge.

Feet grayish; tail bicolor *A. m. orophilus*

Feet and tail wholly blackish *A. m. orientalis*

Akodon mollis altorum Thomas.

Thirty specimens: Cajamarca (13), Hacienda Limon (4), Hacienda Llagueda (9), mountains near Otuzco (4).

As in the case of typical *mollis*, this form was found principally about

cultivated fields. It differs from *mollis* only in slightly darker color and heavier pelage, characters which often appear slight on comparison of single examples but which are quite obvious when small series are considered. Specimens from Hacienda Limon just west of the Marañon River show slight tendency to development of the cranial characters of the eastern forms *orophilus* and *orientalis*.

Akodon mollis orophilus Osgood.

Fifty-one specimens: Mountains east of Balsas at 10,000 ft. altitude (21), Chachapoyas (1), near Leimabamba (8), Tambo Ventija, near Molinopampa (21).

In the heavily wooded canyons, which increased in number after we crossed the Marañon, this mouse was found associated with *Thomasomys*, *Rhipidomys*, and *Oryzomys albigularis* and it generally outnumbered any of these. It was found also in open swamps at high altitudes living in long grass or rushes quite after the manner of northern voles of the genus *Microtus*. In certain of these places, the labyrinthine runways, open burrows, and fresh grass cuttings so familiar to the northern collector were found in great numbers. In other places, as for example heavy woods or rocky stream beds, the *Akodons* seemed to lead wandering lives and have as retreats only natural openings in or near the ground.

Akodon mollis orientalis Osgood.

Four specimens: Poco Tambo, about 50 miles east of Chachapoyas (3), Tambo Almirante, near Uchco (1).

This is the easternmost form of the *mollis* group. It inhabits the dense, humid, but relatively cool forest which forms the practically unbroken cover of the lower slopes of the eastern Andes. In this region it is possible that its range may overlap that of *Akodon ærosus* which is found slightly lower down.

Akodon ærosus Thomas.

Ten specimens: Tambo Yaku (3), Moyobamba (7).

This is a species of the heavy eastern forest where it lives in dense vegetation in company with *Oryzomys l. nitidus*. It was not found in abundance, a line of fifty carefully placed traps seldom yielding more than one specimen in a night.

Phyllotis andium Thomas. LEAF-EARED MOUSE.

Sixteen specimens: Cajamarca (8), Hacienda Limon, near Balsas (4), Hacienda Llagueda (2), mountains near Otuzco (2).

In external appearance and in habits, these mice strongly suggest certain species of *Peromyscus* inhabiting western North America. They were found principally in relatively dry and rocky situations and were nowhere abundant.

Average measurements of seven adults are as follows: Total length 232 (211-244); tail 119 (109-131); hind foot 24.8 (24-26.5).

Phyllotis andium stenops subsp. nov.

Type from the Rio Utcubamba, 15 miles above Chachapoyas, Peru. No. 19840 Field Museum of Natural History. Adult male. Collected May 30, 1912, by W. H. Osgood and M. P. Anderson. Orig. No. 4805.

Characters.— Similar in general to the typical form; tail averaging slightly longer; ears darker-colored; nasals and rostral part of skull decidedly narrower. Upper parts ochraceous buff to clay color mixed with dusky to produce a general effect near wood brown; sides of face more or less grayish; under parts washed with creamy or buff; feet white; tail sharply bicolor.

Measurements.— *Type*: Total length 249; head and body 117; tail 132; hind foot 26.5; ear from notch (dry) 18.5. Average of six adults: Total length 236 (222-249); tail 126 (120-134); hind foot 24.7 (24-26.5). Skull of *type*: Greatest length 29.2; basilar length 22.9; zygomatic breadth 14.4; interorbital constriction 4; nasals 11.3 x 3.3; palatine foramina 6.8; diastema 7.6; upper toothrow 4.5; average width of nasals in 8 adults 3.32 (2.9-3.8); average width of nasals in 7 adults of *P. andium* 3.94 (3.7-4.5).

Remarks.— Like the *Akodon* and other rodents, the *Phyllotis* of the eastern cordillera differs in certain slight but constant characters from that of the western cordillera. Eleven specimens from Chachapoyas and vicinity are characterized principally by the narrowness of their nasals as contrasted with *P. andium* from Cajamarca. Both forms differ from *P. haggardi* in greater length of tail.

Phyllotis tamborum sp. nov.

Type from Tambo Carrizal, mountains east of Balsas, Peru. Altitude 5,000 ft. No. 19,838 Field Museum of Natural History. Adult female. Collected May 18, 1912, by W. H. Osgood and M. P. Anderson. Orig. No. 4,745.

Characters.—A relatively small *Phyllotis* with a rather long tail, small ears, and a slender elongate skull. Color about as in *P. andium*; upper parts pale clay color mixed with dusky and toned somewhat by the slaty under color in a specimen not very heavily pelaged; under parts dull white tinged with creamy; feet white; tail bicolor; ears buffish gray. Skull small and slender; nasals long; interorbital space contracted; frontals relatively narrow posteriorly; supraorbital edges slightly rounded, not sharply edged as in *P. amicus*; braincase shallow; interparietal distinctly angled posteriorly; teeth about equal in size to those of *P. amicus*; audital bullæ smaller.

Measurements.—Type: Total length 217; head and body 99; tail 118; hind foot 24; ear from notch (dry) 16. Skull of type: Greatest length 25.6; basilar length 20; zygomatic breadth 12.8; interorbital constriction 3.8; greatest dorsal breadth of parieto-frontal suture 6.7; depth of braincase including audital bullæ 8.5; interparietal 8.8 x 2.7; nasals 10.3 x 2.8; palatine foramina 6.2; diastema 7; upper toothrow 4.1.

Remarks.—The type of this species was obtained at the same locality as the peculiar *Oryzomys polius*. It is smaller than *P. andium* and *P. haggardi* and scarcely exceeds *P. amicus* from which its small ears readily distinguish it. Possibly its nearest relative is *Phyllotis elegantulus*¹ the type of which is supposed to be from Pallatanga, Ecuador, and, although described recently, was collected more than 50 years ago. It is evident, however, that even if liberal allowance be made for the unreliability of measurements taken from an old alcoholic specimen, *P. elegantulus* is still smaller than the species here described, the tail length being given as 70 and the hind foot as 21.

Phyllotis amicus Thomas.

Seven specimens, Menocucho.

This small series was obtained among rocks and thorny bushes a few rods beyond the canefields and irrigated areas. Average measurements of five adults are: Total length 191 (182–198); head and body 82 (74–87); tail 107 (100–112); hind foot (c. u.) 22.2 (22–23); ear from notch (dry) 19.5 (18.5–21).

Eligmodontia sorella Thomas.

Two specimens from an elevation of about 11,000 feet in the mountains directly northeast of Otuzco agree closely with the description of this species except that their skulls have slightly larger dimensions than

¹ Thomas, Ann. & Mag. Nat. Hist., (8), XI, p. 139, 1913.

those given for the type. The type locality, 8 miles south of Huamachuca, is not far from this region which appears to be almost or quite the northern limit of the range of the genus *Eligmodontia*. These mice were caught in tall grass and weeds growing about the bases of rough limestone exposures on the very top of the mountains.

Holochilus sp.

One specimen too young for specific determination was taken at the edge of a grassy opening in the forest at Tambo Yaku. It is of importance, however, since it greatly extends the range of the genus *Holochilus*, heretofore known only from eastern South America.

Sigmodon peruanus Allen.

Four specimens, Pacasmayo.

The reference of these to *Sigmodon peruanus* is provisional. Pacasmayo is situated about halfway between Trujillo, the type locality of *Sigmodon peruanus*, and Eten, the type locality of *S. simonsi*. Our specimens of *Sigmodon* taken there seem somewhat intermediate between the two named forms, but to which they are nearer is uncertain since the type of *peruanus* and only known specimen from Trujillo is so aged and in such poor condition of pelage that no fair comparisons with other existing specimens are possible. The Pacasmayo specimens are slightly larger and darker colored than topotypes of *S. simonsi* but they agree in having distinct buffy eyerings and bicolored tails whereas the type of *peruanus* has only slight indication of an eyering and its tail is a dull buffy brown scarcely darker above than below. It is doubtful if these characters are wholly the result of the age of the type, but in the absence of topotypes, the name *peruanus* may be applied to our specimens. Efforts to obtain topotypes were unsuccessful and although we trapped assiduously at Trujillo for several days, we caught only *Oryzomys xanthæolus* where we hoped for *Sigmodon*. During a much longer time at Pacasmayo, only four specimens were taken and of these only three in traps, the fourth having been killed with small shot as it ran across a sandy space between two thorny bushes.

Dasyprocta fuliginosa Wagler. SOOTY AGOUTI.

An adult male obtained near Balsapuerto seems referable to this species. Others were seen near Rioja and Moyobamba. It is their habit to come out in early evening and sit at the edge of a road or trail

ready at the least alarm to spring back into cover. I saw several in such places quite reminding of rabbits in a northern country.

Proechimys brevicauda (Günther). HUALLAGA SPINY RAT.

Thirty-two specimens, vicinity of Yurimaguas.

This series includes specimens of varying ages from those in the soft sooty juvenal coat to very aged ones with harsh pelage and teeth worn down nearly to the roots. In spite of a color variation, which within its limits ranges freely, the series as a whole presents a general appearance of uniformity. The greatest variation is in the under parts which can scarcely be said to be exactly alike in any two individuals. Fulvous and white are distributed in varying proportions, in general occupying about equal areas of the under parts. The chin and throat with scarcely any exception are fulvous and likewise the sides of the belly. Sometimes the white is reduced to a small pectoral and an inguinal patch or it may cover practically the entire belly and run forward to the middle of the throat.

Chamicuros, the type locality of *brevicauda*, is not far from Yurimaguas, and as was to be expected, Günther's type shows practically complete agreement with our specimens, comparison with which has been made by Mr. Thomas. Average flesh measurements of seven adults are as follows: Total length 37½ (335-420); head and body 230 (205-277); tail 141 (130-162); hind foot 49 (46-52).

Mr. Anderson found these rats abundant in the vicinity of Yurimaguas especially in small *chacras* where they were feeding on plantains.

Proechimys sp. SPINY RAT.

Thirteen specimens, Lagunas, Huallaga River.

Although agreeing in size and general cranial characters with *P. brevicauda*, this series as a whole is so markedly different in color that at first glance its distinctness would scarcely be doubted. The general appearance is much the same as that of *P. semispinosus*, the under parts being in every case pure snowy white throughout without any trace of the fulvous so characteristic of *brevicauda*. There is also a soft quality in the pelage which is not shown by the Yurimaguas series of *brevicauda*. When specimens from many more localities are available, it seems probable that a fulvous-bellied and a white-bellied form may be differentiated and some definite range be assigned to each. To attempt to do this now would serve no particular purpose and might cause future confusion.

Proechimys sp. SPINY RAT.

Three specimens from Yurimaguas differ decidedly from the large series from that locality unquestionably referable to *P. brevicauda*. That they merely represent extreme variation is perhaps not impossible, but further collections from the same and the neighboring region may show that they belong to another species. They are characterized by pure white under parts, like the series from Lagunas, but with very long tails, harsh pelage, and largely white hind feet. Two adults measure: Total length 388, 366; head and body 220, 213; tail 168, 167; hind foot 50, 49.

Mesomys ecaudatus Wagner. HEDGEHOG RAT.

Four specimens, Munichis, near Yurimaguas.

In describing *Mesomys stimulax* from the Tocantins, Thomas says: "This is only the fifth recorded specimen belonging to the rare genus *Mesomys*." ¹ The total, therefore, is now increased to nine, of which the above small series constitutes nearly half. It is possible that comparison of modern material would make it necessary to use for our specimens Günther's name *ferrugineus*, the type of which came from the same region, but Thomas (l. c.) has concluded, from comparison of Günther's old type with specimens from the lower Amazon, that no separation is justified. The Yurimaguas specimens show only slightly greater measurements than those given for typical *ecaudatus* and there is no appreciable discrepancy in color. The under parts are not quite "uniformly buffy" but the change from the creamy buff of the throat and breast to the rich ochraceous buff of the abdominal region is gradual. Two of our specimens have perfect tails with long pencils at the tip, a third lacks the terminal half of its tail, and the fourth is tailless like the original type of *ecaudatus*.

Flesh measurements of an adult male are: Total length 412; head and body 209; tail 203; hind foot 32. Skull: Greatest length 45.7 (44); ² basilar length 35.1 (33); zygomatic breadth 24 (22.5); nasals 13.8 x 4.8 (12.4 x 5); interorbital breadth 11.9 (11); mastoid breadth 20.7 (20); palatal length 15.2 (15.3); diastema 9.4 (9.9); palatal foramina 3.8 (3.8); upper toothrow 7.4 (6.7).

Mr. Anderson found these rats in the hut he was occupying at the small native settlement of Munichis. He was unable to catch them in

¹ Ann. & Mag. Nat. Hist., (8), VII, p. 608, June, 1911.

² Measurements in parentheses are those given by Thomas for a specimen from the lower Amazon.

traps and only secured them by shooting them when they came out and ran about in the candlelight during the evenings. After exhausting the possibilities of his own hut, he tried various others but had no further success.

Cavia atahualpæ Osgood. MOUNTAIN CAVY.

Four specimens, Cajamarca.

Cavies were obtained only at one locality, a swamp on the outskirts of Cajamarca. Although they seemed fairly common in this place, it was difficult to obtain perfect specimens. Most of the area was covered with from one to two feet of water and thickly grown with tall rushes. Near the edges were stretches of soft spongy turf and pools of shallow water covered with floating or partially anchored vegetation. Here the runways of the cavies were found threading the rushes and passing from one relatively dry place to another. A few traps were placed in these runways but seemed to be avoided and no specimens could be secured in this way. But although apparently so shy of traps, the cavies exposed themselves to view with considerable unconcern during a short period just before nightfall, so it was sometimes possible to shoot them. The principal difficulty was to sight one in the thick rushes before it was so near that a charge of shot would ruin it as a specimen.

Signs of cavies were noted also in a grassy swamp near Tambo Ventija east of Molinopampa. All efforts to obtain specimens there were unsuccessful and it was concluded the colony had recently been deserted.

Viscaccia sp. VISCACHA.

Viscachas undoubtedly inhabit many of the higher parts of the mountains we traversed but the region is near the northern limit of their distribution and they are everywhere scarce and difficult to obtain. A few burrows at least lately occupied were found along the highest ridges above Otuzco and Hacienda Llagueda, but traps placed about them remained un sprung. They are said to occur in the mountains surrounding Cajamarca and even in the rocky cliffs along the river in the hot Marañon Valley. West of the Marañon, no reliable reports of their occurrence were obtained.

Sylvilagus capsalis Thomas.

Two halfgrown young, Hacienda Llagueda.

These may be tentatively referred to *S. capsalis* although they are

too young for positive identification. Reports of rabbits were obtained at Llagueda, at Cajamarca, and at Hacienda Limon, but the animals themselves were very difficult to secure. We found no signs of them except in cultivated alfalfa fields, and there repeated efforts to trap or to shoot them were unsuccessful.

Sylvilagus defilippii (Cornalia).

One adult and six young from Moyobamba are in the collection. These agree rather closely with the description of *S. b. inca** except that the ears are only slightly blackish distally and the proximal half of the upper side of the hind feet is rather extensively whitish. The same characters were noted by Cabrera† in specimens from the type region of *S. defilippii* and it is therefore probable that our specimens are nearer to that species than to *S. b. inca* from southeastern Peru.

Rabbits were by no means common at Moyobamba and in the course of several weeks collecting only two were seen. In both cases, this was in bushy thickets near the banks of the river.

Tremarctos ornatus (F. Cuvier). SPECTACLED BEAR.

An adult female was obtained in the mountains about 10 miles northwest of Menocucho. A male accompanying it was wounded but made its escape.††

In this region the spectacled bear inhabits extremely arid mountains which support only a scanty vegetation consisting principally of cactuses and small thorny bushes. These mountains are from 1,000 ft. to 5,000 ft. above sea level and although some of the higher slopes and small canyons support scattered trees and occasional thickets of mixed vegetation, the general character of the region is excessively arid and not greatly different from the desert plain stretching westward to the sea. A fairly common shrub, a species of *Capirras* called *chapote* by the natives, produces a pear-shaped fruit having a hard outer shell enclosing numerous seeds which evidently form the principal food of the bears. The region is for long periods almost waterless and animal life is very limited. Signs of small mammals, except an occasional fox track, were

*Thomas, Ann. & Mag. Nat. Hist., (8), XI, p. 210, February, 1913.

†Trab. del Mus. de Cienc. Nat., Madrid, ser. Zool. No. 9, p. 9, April, 1913.

††A popular illustrated account of the hunt on which these bears were encountered was published in *Outdoor World and Recreation*, N. Y., XLVIII, pp. 367-370, June, 1913.

wanting, and birds were very scarce, several species of doves being almost the only ones seen.

Although advised by the natives that the early morning was the best time for hunting, we sighted a pair of bears at midday apparently active and feeding in the full glare of the tropical sun. They were on a low bench just above the boulder strewn *playa* or dry stream bed along the opposite side of which we were picking our way at a distance of about half a mile. They might have been overlooked if one of them had not drawn our attention by standing erect. After a rapid chase, during which a couple good dogs were of much assistance, the female bear was killed while the other, presumably a male, was only slightly wounded and made its escape.

From reports received from local sources, it is evident that bears are fairly common in numerous localities in the arid region similar to the one in which we found them. That the bears of this region can be the same species or subspecies as those of the forested regions of eastern Peru does not seem probable, but without specimens of both sexes from both regions the matter remains doubtful.

It is even possible, as suggested by Tschudi,¹ that the original type of *Ursus ornatus* came from this region by way of Trujillo in spite of F. Cuvier's statement that it came from Chile. Certain it is that it must always have been an easy matter to bring living bears into Trujillo, whereas specimens from Chile have been recorded but rarely if at all.

Canis sechuræ Thomas. PERUVIAN DESERT FOX.

Two adult females, Menocucho.

Only lack of time prevented our obtaining a series of this species, for it was fairly common and not difficult to trap. Tracks were seen daily leading up and down the paths about the cane fields, in the sandy stream beds, and occasionally out on the open desert at considerable distance from water. Small ground doves which abound evidently are the favorite prey of the foxes.

Canis culpæus reissi Hilzheimer. NORTHERN CULPEO.

Canis reissii Hilzheimer, Zool. Anzeiger, xxx, p. 116, Apr. 17, 1906 — Type from Quito, Ecuador.

The canids of southern Chile, Patagonia, and Tierra del Fuego have long been known to be of two general types, one small and foxlike, the other larger and more wolflike, although still somewhat smaller than a

¹ Fauna Peruana, pp. 91-92, 1844.

coyote. The smaller animal, currently known as *Canis griseus*, has been reported frequently from localities well to the northward in Chile, Bolivia, and southern Peru and is represented by a desert form, *Canis sechuræ*, on the northern coast of Peru; but the larger one, usually called *Canis magellanicus*, has been regarded as chiefly southern in distribution and the most northerly record has been that of the valley of Copiapo in north central Chile where Darwin found it some seventy-five years ago. It was with some surprise, therefore, that I received reports in northern Peru of a *zorro del monte* or *lobo del monte* said to be much larger than the well known small fox of the coast region. Later I saw its tracks in several localities between Cajamarca and Moyobamba and once near Molinopampa at about 9,000 ft. altitude I succeeded in trapping one of the animals only to have it pull out and escape as I approached the trap.

Through the courtesy of Mr. E. W. Nelson, I have been privileged recently to examine a specimen of a small wolf collected for the U. S. Biological Survey in Chosica Canyon, west of Lima, Peru, by Dr. C. H. Tyler Townsend. This specimen appears to represent a slightly differentiated subspecies of the Chilean Culpeo or Magellanic Wolf. It seems probable, moreover, that Hilzheimer's name *Canis reissii* should be used for this northern form although neither description nor figure make this wholly conclusive. If this be the case, it should be called *Canis culpæus reissi* since Molina's name *culpæus*¹ has many years priority over *magellanicus*,² the name current for the southern form. Molina had no type and fails to mention a definite locality but his description is adequate and plainly refers to the animal of central and southern Chile where the vernacular name *culpeu* was and probably still is in use. All authors thus far who have made comparison of the animal of central Chile with that of the extreme south have concluded them to be identical. Therefore, in the absence of evidence to the contrary, it seems necessary to regard *magellanicus* as a synonym of *culpæus*. Gray's type of *magellanicus* was from Port Famine which is on the continental side of the Straits, not on Tierra del Fuego as stated by Mivart.³ The form inhabiting the island of Tierra del Fuego, if distinct from that of the mainland, will take the name *Canis lycoides* Philippi.⁴

As represented by the Peruvian specimen before me, the northern form differs from typical *culpæus* in slightly smaller size, richer color,

¹ Saggio Storia Nat. Chile, p. 293, 1782. I have seen only the second edition and a translation of this work.

² Gray, Charlesw. Mag. Nat. Hist., I, p. 578, Nov., 1837.

³ Monogr. Canidæ, p. 53, 1890.

⁴ Anales. Univ. Chile, p. 4 (author's ed.), Oct., 1896.

and relatively heavier dentition with the last upper molar particularly large and the whole toothrow in consequence more crowded.

Measurements of the skull and teeth are as follows: Occipito-nasal length 137.5; basal length 144.8; basilar length 136; basion to sphenoidium 37.4 (44);* sphenoidium to gnathion 102 (112); zygomatic breadth 82.3 (91); breadth across postorbital processes 37; interorbital constriction 26.7; breadth of braincase 49.5 (51); length of nasals 54 (62); length of palate 77.3 (82); length of Pm.¹ 4.6 (4); Pm.² 9 (8); Pm.³ 10.7 (10); length and breadth Pm.⁴ 17.7 x 8.3 (15 x 7); M.¹ 10.6 x 14.5 (10 x 14); M.² 6.5 x 10.1 (5.5 x 6.5); length of Pm.₁ 4.4 (4); Pm.₂ 9.3 (8); Pm.₃ 10 (10); Pm.₄ 10.9 (11); length and breadth M.₁ 17 x 7 (16 x 7); M.₂ 8 x 5.7 (8 x 4); M.₃ 3.9 x 3.3 (3 x 3).

For the present, I have retained this species and closely allied forms in the genus *Canis*, feeling that this course is desirable until such time as an exhaustive phylogenetic study of all the South American canids is made. An able contribution to this subject has been made recently by Pocock† who points out certain cranial and dental characters distinguishing *Canis antarcticus* from *Canis latrans*.‡ He also demonstrates a degree of similarity between *Canis antarcticus* and *C. thous*. The *thous* group, however, shows similarity to *Urocyon*, and speaking generally it might be said that true *Canis* and *Urocyon* are at opposite ends of a series in which species like *C. antarcticus* and *C. thous* form the intermediate steps. In this series *C. antarcticus* unquestionably falls nearer to true *Canis* than to *Urocyon*. Just where generic and sub-generic divisions should be made, therefore, depends upon more thorough investigation than has yet been made.§

* Measurements in parentheses are those of the type of *C. magellanicus* published by Mivart (Monogr. Canidæ, pp. 55-56, 1890).

† Proc. Zool. Soc. Lond., pp. 382-393, 1913.

‡ Much larger series of the *latrans* group than were available to Pocock bear out his general observations, although occasional skulls show a slightly developed parietal shield quite equal to the condition in certain species of "*Cerdocyon*."

§ While the above is in press, the current (March) number of the Annals and Magazine of Natural History comes to hand with its important discussion of the names of South American Canidæ by Thomas. It is regrettable from the standpoint of those less fortunately situated, that one so eminently competent and so favored with material should not have characterized the various groups otherwise than nomenclaturally, for at least part of them have not been defined zoologically.

The Peruvian specimen mentioned above is doubtless referable to *Pseudalopex culpæus andina* of Thomas, described as slightly different in color from *P. c. reissi* of Ecuador and probably also of that part of Peru in which our work was done. *P. c. magellanicus* is recognized as a third subspecies and *P. lycoides* of Tierra del Fuego is given specific rank.

Felis onca Linnæus. JAGUAR.

A skull of an adult male secured at Moyobamba shows some characters when compared with specimens from Guiana and northern Brazil. With an equally heavy dentition, the skull has smaller general dimensions but thicker heavier parts. A short broad braincase, heavy post-orbital processes, almost uniformly broad nasals, and small anterior nares are among its peculiarities. When sufficient material is accumulated for revision of the jaguars, it is probable that a race from the eastern base of the Andes will prove recognizable. For such a race, the name *Felis onca peruviana* Blainville may be available.

Jaguars range up to an elevation of at least 7,000 feet in the eastern Andes, but in the region traversed by us they are not particularly common. Tracks were seen at Tambo Yaku and at several points in the forest between Moyobamba and Balsapuerto.

Felis puma Molina. PUMA.

In the mountains of western Peru, the puma is said to be fairly common and as elsewhere strongly addicted to the habit of preying on live stock. Our attempt to secure one at Hacienda Llagueda with a small and scarcely trained pack of dogs was unsuccessful. This was largely on account of the very steep precipitous canyons which were for the most part quite impassable for horsemen. During our stay at Hacienda Limon a sheep was killed by a puma and the carcass was poisoned in the hope of disposing of the offender but without result. In the eastern montagna region from Moyobamba to Yurimaguas we received occasional reports of the puma.

Felis wiedi Schinz. MAXIMILIAN'S TIGER CAT.

One specimen: Moyobamba.

Although slightly immature, this example shows by the reversed fur on the neck and by its dimensions that it represents *Felis wiedi* or a very closely allied form. The fur is long (20-22 mm. on middle of back), thick, and very soft. From the occiput to the shoulders there are but three narrow black lines, the middle one divided posteriorly. The tail has but nine black rings, slightly wider than the fulvous spaces between them. Flesh measurements are: Total length 820; head and body 465; tail 355; hind foot 125.

We had only scattering reports of small cats in the region from Moyobamba westward and saw very few skins in the possession of the natives. From Moyobamba eastward they are more common.

Tayra barbara peruana (Tschudi). TAYRA.

One was seen at Tambo Carrizal east of Balsas May 19. It trotted down a trail carrying a bird in its mouth, its head held high and its whole appearance one of satisfaction and nonchalance. I was standing near the trail without my gun and it did not see me until within a few feet when it dashed off in another direction. Another was seen at Moyobamba by Mr. Anderson under similar circumstances.

Conepatus zorrino Thomas. SKUNK.

An old male, Menocucho.

The type locality of *C. zorrino* is Eten, a short distance north of Menocucho and less removed from the actual coast, but the fauna of the two places differ but little. The skunk obtained at Menocucho is evidently somewhat larger than the type of *zorrino* and it differs also in the white stripes which do not extend to the base of the tail but stop at the flanks as described for the more southern species, *C. arequipæ*.

Flesh measurements are: Total length 670; head and body 418; tail vertebræ 252; hind foot 85.

Conepatus sp.

An adult female from Hacienda Limon is not definitely identifiable without comparison with types.

Rhynchiscus naso (Wied).

Eight specimens, Nazareth, Yavari River.

The favorite roosting place of these bats is the under side of a tree, stub, or large rock overhanging the water. Such backgrounds blend well with their coloration but are frequently so exposed that at short distances one has no difficulty in distinguishing animal from vegetable. When disturbed they flit away together like a company of butterflies and quickly attach themselves to the nearest similar roosting place, often not flying more than twenty feet. They seem to cling to rather than hang from the nearly perpendicular surfaces and although the head and angles of the wings may be free the abdomen and tail membrane are pressed flatly against the bark or stone. The number found together was from ten to twenty and although specimens were secured only at Nazareth, many were seen along the Paranapura River between Balsapuerto and Yurimaguas.

Noctilio albiventer Spix. COMMON NOCTILIO.

One specimen, Yurimaguas.

This is a dull brownish specimen with the under parts only slightly lighter-colored than the back. In size, it scarcely equals ordinary specimens of *albiventer* from Brazil and it is considerably smaller than the size given for *N. zaparo*, the type of which came from the Napo River in Ecuador not far north of Yurimaguas.

Glossophaga soricina (Pallas). COMMON GLOSSOPHAGA.

Sixteen specimens, all from Moyobamba.

These were mostly brought to us by small boys who found them roosting under the thatch of the village houses. They are essentially like specimens from eastern Brazil.

Glossophaga soricina valens Miller. PERUVIAN GLOSSOPHAGA.

Glossophaga soricina valens Miller, Proc. U. S. Nat. Mus. XLVI, p. 420, Dec. 31, 1913 — Type from Balsas, Peru.

Twenty-nine specimens, Balsas.

Although not seen elsewhere in western Peru, *Glossophagas* were found in great abundance at Balsas roosting under the roof of a church. The building was large and barnlike, simply constructed of rough masonry walls and roofed with small poles which were overlaid with thatch. The interior formed a single rectangular room about 60 ft. long by 25 ft. wide with a raised altar at one end and a plain earth floor extending thence to the door. There were no windows and when the large door was closed only a limited amount of light was admitted through the space between the eaves and the top of the walls. Somewhat to my surprise, requests for the key to the church and permission to shoot in it in the absence of the priest were readily granted and about half the small population of Balsas accompanied us to watch the proceedings. On opening the door, the light streamed in and the roof was seen to be literally covered with bats which immediately began squeaking and shifting their positions. At the first shot, a cloud of them fluttered about the room a moment and then mostly settled again, only a few going outdoors under the eaves. After shooting into various parts of the roof and carefully scrutinizing the remainder, it was evident only one species was present. The total number, as estimated at the time, was not less than 2,000. A larger series of specimens might have been obtained, but some of the people that followed us took advantage

of the occasion to perform their devotions and although I was the only one that seemed to have any idea of desecration, I soon felt like retiring especially since at the last shot I noticed that even as I raised the gun a chola girl had slipped in front of me and as the report rang out she was devoutly kneeling in prayer almost under the muzzle of the gun.

Hemiderma perspicillatum Linnæus. COMMON HEMIDERMA.

Fifty-three specimens: Balsas (1), Moyobamba (51), Tambo Yaku (1).

This very common bat was particularly abundant in the vicinity of Moyobamba and if desired it might have been obtained in much larger numbers. Its usual roosting place is under a thatched roof where it often collects in large numbers in company with *Glossophaga*.

Vampyrops zarhinus H. Allen.

A bat obtained near Yurimaguas is referred to this species since it is slightly larger than *V. z. incarum*.

Artibeus planirostris fallax Peters.

Seventeen specimens, Moyobamba.

This series presumably represents the *A. hercules* of Rehn which Andersen has referred with a slight query to the synonymy of *A. p. fallax*.* It might now be possible to dispose of this name still more definitely if satisfactory material representing typical *fallax* were at hand. As compared with two specimens from Cayenne (*Uroderma validum* of Elliot), the Peruvian bats are slightly larger and decidedly less brownish in color. The skulls measure slightly more than the average given by Andersen but fall a trifle short of his maximum. A larger series of *fallax* would probably show enough variation to cover such differences.

This large *Artibeus* was fairly common at Moyobamba where it was found roosting in mango trees under the protection of their thick heavy foliage.

Desmodus rotundus (Geoff.). VAMPIRE.

Forty-three specimens: Hacienda Llagueda (35), Cajamarca (7), Moyobamba (1).

Blood sucking bats are abundant throughout the greater part of the

*Proc. Zool. Soc. Lond., p. 242, Sept., 1908.

region we traversed. In the *jalcas* at elevations of 10,000 feet or more, we had no evidences of them, but at altitudes between 1,000 ft. and 9,000 ft. they are generally distributed. Certain localities are noted for them and are avoided by mule drivers as much as possible. At Hacienda Llagueda and near Cajamarca, we found them roosting in caves, and old mine shafts or prospect holes. In such places, the ground beneath the suspended bats is usually filthy with accumulated excrement. It sometimes forms great pools of dark brown digested blood more or less watery or viscous in the center and gradually hardened or encrusted at the edges. A very large cave which we examined near Molinopampa must have contained several thousand of these bats and some of the pools of excrement were two to three feet deep.

Our pack mules were constantly subject to attack from bats and the steady annoyance and loss of blood affected their general condition very rapidly. The point of attack was almost invariably at the top of the withers, apparently because this is one of the parts the victim is least able to protect. The wound inflicted shows on examination how effective is the highly developed cutting machine. A small nearly round button of skin about one fourth of an inch in diameter is removed and after the bat has sucked its fill, blood continues to flow for some time, streaking down the animal's sides and even to its forelegs. Just how far an animal might be persecuted is uncertain but it seems quite possible that one weakened or temporarily defenceless might be put to death by its bloodthirsty tormentors. One of our mules was bitten thirteen times in a single night and it was not uncommon for one or more of them to show eight or ten wounds when it was brought in from a night at large. It was noticed that some of the mules were bitten much less frequently than others; in fact, one animal which was easily the most sagacious and always in better condition than the others was practically exempt throughout the trip. That this was due to superior ability to ward off the pests was quite apparent, especially since toward the end of the trip the animals in poorest condition continually suffered more and more than those not so weakened physically from other causes.

On two occasions our men were bitten by bats, once when we were sleeping in the same room with them in a house in Moyobamba, the men in an alcove at one end and ourselves in the main room with doors open for free ventilation. I heard bats flying about during the night but supposed they were the common *Hemiderma* until morning when one of the men came out with a sheepish look on his face and held up his bare foot showing one of the characteristic round punctures on the end

of his great toe. He made light of it and said he had often had the same experience. The wound healed quickly and caused only slight inconvenience. Later, one of our porters or *cargueros* was bitten on the same spot, the great toe, while sleeping in the open air during the journey from Moyobamba to Balsapuerto.

Amorphochilus schnabli Peters.

Two specimens, Hacienda Limon, near Balsas.

Since the publication of the original description of this rare bat by Peters in 1877, no additional records of it have appeared. Its rarity in collections is perhaps due to its habit, as observed by us, of flying at an hour when humans usually are asleep. The two individuals obtained were taken on separate occasions but in each case the hour was approximately three in the morning. Happening to awaken at that time, we heard them flying about our room and quickly closing the doors made them prisoners.

These specimens agree closely with the excellent description and figures published by Peters. The greatest discrepancy is in the color, which he gives as dark cinnamon brown. In a dry skin unaffected by preservative the color of the upper parts is dark smoke gray tinged with drab, the hairs being long (8–10 mm.), soft, and at their bases mouse gray. The under parts are practically the same color as the back and about the muzzle there is a tinge of brownish, perhaps extraneous.

The form of the skull in general is very similar to that of *Furipterus*; braincase slightly higher and narrower but palate broader, especially anteriorly; rostrum slightly longer and broader with lachrymals more expanded. In our specimen the braincase is relatively lower than in the figures published by Peters. Consequently the distinction drawn by Miller in his key to the genera of *Furipteridae*¹ does not hold, the ratio between the height and length of the braincase being practically the same in the two genera (see measurements). The teeth show numerous slight departures from those of *Furipterus*. The outer upper incisor is separated from the canine by a much greater space, about equalling the basal length of the canine. The upper canine has its posterior cutting edge entire and with only slight concavity toward the tip; its cingulum is scarcely developed, the conspicuous anterior and posterior cusps of *Furipterus* being absent. The posterior upper premolar has only a slight indication of an inner cusp. The upper molars

¹ Families and Genera of Bats, p. 188, 1907.

are larger and wider than in *Furipterus* and the principal cusps are higher, but the cingulum is so slightly developed as to be visible only upon the closest examination. The lower incisors, canine, and premolars are more similar in the two genera than the corresponding upper teeth, but in *Amorphochilus* there is practically no tendency to the development of cusps from the cingulum. A slight space exists between the inner pair of lower incisors. Lower molars with scarcely any cingulum. Entoconids relatively farther from metaconids; commissure from entoconid to hypoconid higher and stronger, especially in the first lower molar, in which the entoconid is but slightly higher than the commissure, which forms a broad blade.

The following measurements have been taken: Male, measured in flesh: Total length 86; tail 28; hind foot 7. Female, in alcohol: Total length 83; head and body 54; tail 29; hind foot 6.5; forearm 36; third digit: metacarpal 34.4, 1st phalanx 5.2, 2nd phalanx 22.2; fourth digit: metacarpal 31, 1st phalanx 6.8, 2nd phalanx 10.5; fifth digit: metacarpal 31.2, 1st phalanx 10.5, 2nd phalanx 6.7; tibia 18; calcaneum 15.3. Skull: Greatest length 12.1; basal length 11.3; interorbital constriction 13.1; zygomatic width 7.3; mastoid width 6.5; maxillary width at base of M^2 4.8; width between tips of canines 2.5; width of braincase 5.8; depth of braincase including audital bullæ 6.7; frontal angle to occiput 7.6; upper toothrow, C to back of M^4 4.7; width of M^3 1.3; lower toothrow including incisors 5.7.

Myotis nigricans (Wied).

Six specimens, Moyobamba.

Although fairly common and widely distributed, vespertilionine bats usually are more difficult to obtain in South America than those of other groups. In almost all cases where we saw them, it was under conditions where shooting was extremely difficult. While staying at "Los Baños," near Moyobamba, we discovered the roosting place of some of these small bats in the side of the wall of a house, the only entrance apparent being a crevice in a door jamb. A light net stretched over this crevice early in the evening soon entangled six bats, evidently all that were roosting in that place, for no further captures were made although the net was kept there for several days. Such differences as appear on comparison of these specimens with others from eastern Brazil are not sufficiently marked to warrant any separation at the present time.

Myotis nigricans mundus (H. Allen).

Vespertilio mundus H. Allen, Proc. Acad. Nat. Sci. Phila., p. 280, 1866 — Type from Maracaibo, Venezuela.

Vespertilio concinnus H. Allen, supra cit., pp. 280-281 — Type from Salvador.

Myotis nigricans concinnus Osgood, Field Mus. Nat. Hist., Pub. 155, Zool. Ser., X, p. 65, Jan. 10, 1912.

One specimen, Hacienda Limon, near Balsas, Marañon River.

Although subsequent material may point to a different conclusion, the only one justifiable at present is the reference of this specimen to the form ranging southward from southern Mexico and for which the name *mundus* seems available. In a former paper (supra cit.), I referred a specimen from the vicinity of Maracaibo, Venezuela, to *M. n. concinnus*, overlooking the fact that it is practically a topotype of *Vespertilio mundus* of Harrison Allen. Since *mundus* has page priority over *concinnus*, it will be necessary to use it, although its type unfortunately has been lost.¹ That the description of *mundus* applies to the same species as that of *concinnus* there can be little doubt, the measurements being even smaller than those given for *concinnus*.

Our specimen is slightly smaller than typical *nigricans* and even paler, especially on the under parts, than typical *mundus*. Its skull is somewhat larger than that of the Maracaibo specimen but has the same general form. Both skulls differ from those of *nigricans* in having a narrower rostrum and interorbital space, characters which may prove to be of specific importance, but the disposition of the form as a subspecies of *nigricans* for the present seems more convenient than any other treatment.

Myotis simus Thomas.

A single specimen obtained at Yurimaguas by Mr. Anderson is provisionally referred to this species, with the description of which it is in essential agreement.

Myotis sp.

A relatively large *Myotis* (forearm 41) with well-developed glandular facial rugosities was obtained at Hacienda Limon. In the present imperfect state of knowledge of South American vespertilionine bats, its relationships are scarcely even conjectural.

¹ See Bull. 62, U. S. Nat. Mus., p. 290, 1909.

Molossops milleri * sp. nov.

Type (skin) from Yurimaguas, Peru. No. 19562 Field Museum of Natural History. Female adult. Collected Sept. 30, 1912, by M. P. Anderson. Orig. No. 61.

Characters.—Size small, smaller than any previously described species of *Molossops*; color dark without whitish markings; pelage short but very soft and silky; patches of fur well developed on inner proximal and outer distal sides of forearm and across wing membrane to and covering the middle third of the metacarpal of the fifth digit. General characters about as in *M. planirostris*.

Color.—Upper parts dark glossy blackish brown, the hairs of the middle of the back with pale brownish fawn bases, those of the head and sides nearly or quite self-colored; under parts decidedly paler, Prout's brown to mummy brown, the throat and breast rather paler than the abdomen and sides.

Skull.—Anteorbital or lachrymal breadth decidedly less than half of basal length and evidently less than in related forms; braincase broad and bulging laterally, depressed medially and without suggestion of a sagittal crest; palate moderately domed, slightly concave longitudinally as well as laterally.

Measurements.—Type, measured in the flesh by the collector: Total length 83; head and body 57; tail 26; foot 6.5. Additional measurements from dry skin: Lower leg 10; forearm 29; third digit, metacarpal 29.7, first phalanx 13.2; second phalanx 11. Skull of type: Greatest length 16; basal length 14.7; zygomatic breadth 10.5; anteorbital or lachrymal breadth 6.5; postorbital constriction 4.4; breadth of braincase 8.4; breadth of anterior nares 2.7; front of canine to back of last molar 6.

Remarks.—The dark color of this species renders comparison with *M. planirostris* unnecessary and its small size distinguishes it from all other species. I am indebted to Mr. Oldfield Thomas for making direct comparison of the type of *M. milleri* with that of *M. p. paramus*.

Mormopterus kalinowskii (Thomas). KALINOWSKI'S BAT.

One specimen, Hacienda Limon, near Balsas, Marañon River.

Except in certain larger dimensions, this specimen, an adult female, agrees with the original description of the type. It possesses a well-

*For Mr. Gerrit S. Miller of the U. S. National Museum.

developed subcircular pad at the base of the thumb, and therefore does not differ from *M. minutus* in that respect.¹

Measurements taken from the alcoholic specimen are as follows: Total length 82; head and body 48; tail 34; lower leg 11; hind foot 7.5; forearm 39; third metacarpal 39; fifth metacarpal 24. Measurements of the skull are: Greatest length 15.7; basal length 14.8; zygomatic breadth 9.4; mastoid breadth 8.9; breadth across lachrymal processes 6; interorbital constriction 3.5; occipital depth 5.3; upper tooththrow, without incisors, 5.7.

Molossus obscurus Geoffroy. DUSKY MOLOSSUS.

Eleven specimens: Yurimaguas (1), Moyobamba (10).

This bat, like *Hemiderma* and *Glossophaga*, roosts about buildings but usually in less accessible places, and is therefore not so easily obtained. Average measurements of nine specimens: Total length 110 (105-114); tail 39.88 (37-45); hind foot 9.3 (8-11); forearm (dry) 40.3 (38.5-41.8).

Cebus macrocephalus Spix. BROWN CAPUCHIN MONKEY.

Four specimens, Tambo Yaku, near Rioja.

Although monkeys are said to be common throughout the montagna along our route, we encountered them only once. A small troop passed near our camp at Tambo Yaku July 5 and after two had been shot some of the others lingered in the vicinity until the following day, when two more were killed. They were rather shy and easily started into flight; but they seemed to rely only on their speed and agility in getting away, without any attempt at quick or crafty concealment. When started in a given direction they continued even though it took them almost directly over the cause of their alarm. This species and most other monkeys of the region are much sought as food and they are therefore steadily becoming scarcer near regular routes of travel. We sampled their flesh and found it so well flavored that we preferred it to fresh peccary meat, which was available at the same time. Monkeys are reported as far west as Tambo Almirante at an elevation of about 5,000 ft. and not more than 40 miles east of Chachapoyas.

Reference of these specimens to *Cebus macrocephalus* is provisional. They agree fairly well with the colored figure given by Spix and to a considerable degree with the description and measurements published

¹ Cf. Miller, Bull. Amer. Mus. Nat. Hist., XII, p. 176, 1899.

by Elliot. Although considerable variation may be admitted among the species of this genus, it is more than likely that it is overestimated in many cases on account of material having insufficient or erroneous data as to locality. In specimens taken at one locality by reliable collectors, variation has rather narrow limits.

Flesh measurements of an adult male are: Total length 870; tail 395; hind foot 128; forearm 130; circumference of chest 320. Skull: Greatest length 107; basal length 84.3; zygomatic breadth 77.3; breadth of braincase 54.6; palatal length 34.3; postorbital constriction 39.4; upper molar series 23.1.

Lagothrix infumata (Spix). BROWN WOOLLY MONKEY.

One specimen (♂ ad), Puerto Arturo, near Yurimaguas.

The name *infumata*, as applied to this specimen, is intended in a collective sense to indicate relationship to that species rather than to *L. lagotricha*. The head is dark seal brown as described for *L. thomasi* but the back is without any indication of a blackish dorsal line. In respect to the color of its head, therefore, it appears to resemble *thomasi*, while in the color of its back it is like *infumatus*. Without material for comparison, it is difficult or impossible to determine what should be its exact designation. Flesh measurements are: Total length 1,071; head and body 445; tail 626; hind foot 138.

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