

MAMMALS COLLECTED BY DR. W. L. ABBOTT ON THE
CHAIN OF ISLANDS LYING OFF THE WESTERN COAST
OF SUMATRA, WITH DESCRIPTIONS OF TWENTY-EIGHT
NEW SPECIES AND SUBSPECIES.

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INTRODUCTION.

Between the years 1901 and 1905 Dr. W. L. Abbott, in his zoological explorations of the Malay Archipelago, visited the chain of islands lying off the southern and western coast of Sumatra three times. On these expeditions he collected over 800 specimens of mammals, all of which were presented to the United States National Museum. No general paper covering the mammals of this group of islands as a whole, or covering Doctor Abbott's collections as a whole from the islands that he explored has appeared. A few papers on the mammals of individual islands have been printed (Modigliani, 1889; Thomas, 1894*a*; Miller, 1903*a*, 1906; Andersen, 1906; Lyon, 1908), and the collections made by Doctor Abbott, have been studied in part by Miller (1903*a*, 1903*b*, 1906*a*, 1906*c*, 1911, 1913); Andersen (1905, 1912), Elliot (1910) and Lyon (1913). Two of the most interesting primates discovered in recent years were found among them (Miller, 1903*b*).

About two years ago Mr. Gerrit S. Miller, jr., suggested that I make a study of the mammals of this region. Since then I have been engaged in this investigation during my leisure time. It now seems desirable to publish descriptions of the 28 new forms that examination of the collections has revealed. A list of the islands that Doctor Abbott has visited with the species that have been found on each is appended.

The references given at the end are the more important ones that have appeared dealing with the mammals that Doctor Abbott has collected, and with those of other collectors. They will serve as a guide to the place of publication of the forms listed under the islands.

DESCRIPTIONS OF NEW SPECIES OF MAMMALS.

Order CHIROPTERA.

Family PTEROPIDAE.

CYNOPTERUS BABI, new species.

1903. *Cynopterus titthaecelus*, MILLER, Proc. U. S. Nat. Mus., vol. 26, p. 474, February 3, 1903.

Type-specimen.—No. 114269, U.S.N.M., skin and skull, collected on Pulo Babi, January 8, 1902, by Dr. W. L. Abbott, original number 1411.

Geographic distribution.—Pulo Babi, possibly it may also occur on Pulo Simalur and Pulo Lasia.

Diagnostic characters.—A medium-sized member of the genus (forearm 66 to 68 mm., condylobasal length of skull about 30), of very dark color, darker than *Cynopterus scherzeri* of the Nicobar Islands.

Color.—Upperparts of head, neck, body, small interfemoral area, and haired area of arm and forearm, between bone brown and natal brown, darker anteriorly on the head, and lighter posteriorly; at base hairs are deep mouse gray; underparts olive brown, except on throat, which is dark olive brown or an isabella color; the color of the throat extends up on sides of neck; membrane above and below, including the skin over the finger bones, blackish brown; ear blackish brown with margin as dark as rest of ear.

Skull and teeth.—The skull closely resembles that of *Cynopterus brachyotis* of the Sumatran mainland, as well as that of *C. scherzeri*; it is slightly narrower and the post-orbital constriction is more marked (*scherzeri*, 6 mm., Tarussan Bay *brachyotis*, 6 to 7 mm., *babi*, 5 to 5½ mm.). The teeth do not show any distinguishing characters.

Measurements.—Type: Head and body, 95 mm., expanse 460 (both collector's measurements), forearm 67; thumb, 26; second digit, 46; third digit, 43 by 28 by 37; fourth digit, 41 by 21 by 24; fifth digit, 41 by 20 by 21; tibia, 26; foot, 16; skull, greatest length, 30; condylobasal length, 29.2; zygomatic width, 19; width of brain case, 13; width of palate including outsides of teeth, 9.3; width of palate at posterior free margin, 5.3; antorbital constriction, 6.2; postorbital constriction, 5.5; maxillary tooththrow, 10.2; mandibular tooththrow, canine to last molar, 11.5.

Specimens examined.—Three, all from Pulo Babi; skin and skull of the type and two in alcohol.

Remarks.—The dull color of the species is apparently very characteristic and is as noticeable in the wet alcoholics as in the skin. There

is no lightening of the skin covering the wing bones as so frequently happens in the case of *Cynopterus*. Belonging to a genus which shows comparatively little differentiation among its members, *Cynoterus babi* has no specially striking peculiarities to indicate its affinities. On account of its having the same general size and a uniformly dark color, it is apparently more closely related to *C. scherzeri* than to the Sumatran *C. brachyotis*. It is unfortunate that there are no specimens of *Cynopterus* from Simalur and also from the Banjak Islands.

Family MEGADERMIDAE.

MEGADERMA LASIAE, new species.

1903. *Megaderma spasma*, MILLER, Proc. U.S.Nat.Mus., vol. 26, p. 474, February 3, 1903.

Type-specimen.—No. 114249, U.S.N.M., skin and skull, collected on Pulo Lasia, January 6, 1902, by Dr. W. L. Abbott, original number 1401.

Geographic distribution.—Lasia and Babi Islands.

Diagnostic characters.—A large member of the genus characterized by the width of rostrum and the solidly built portion of the maxilla covering roots of canines.

Color.—Type: Free ends of hairs of upper parts benzo brown or near that color, or between that and hair brown; base of hairs, mouse or light mouse gray; under parts, generally similar but somewhat lighter. Ears and membrane blackish brown except tips of wings which are lighter.

Skull and teeth.—The skull as a whole is slightly larger than that of *Megaderma trifolium* of Sumatra and Java, the rostrum being particularly wide and heavy with roots of canines very heavy, best seen on viewing skull from above. The teeth as a whole are larger than they are in *M. trifolium*, particularly the large premolar and first molar.

Measurements.—Type: Head and body, 80 mm.; forearm, 59; tibia, 34; foot, 20; width of rostrum at apex, 64; condylobasal length, 24.5; brain case, 11.6; maxillary toothrow, 10.

Specimens examined.—Four from Pulo Lasia, two from Babi.

Remarks.—*Megaderma lasiae* is readily distinguishable from the Sumatran-Javan form, but appears to be closely related to *M. natunae*,¹ but is not so large.

MEGADERMA SIUMATIS, new species.

Type-specimen.—No. 114227 U.S.N.M., skin and skull of adult female, collected on Pulo Siumat, December 27, 1901, by Dr. W. L. Abbott; original number 1390.

¹ Andersen and Wroughton, Ann. Mag. Nat. Hist., ser. 7, vol. 19, p. 133, February, 1907.

Geographic distribution.—Siumat Island, and probably Simalur.

Diagnostic characters.—A medium-sized member of the genus somewhat intermediate between *Megaderma trifolium* and *Megaderma lasiae*, particularly with respect to portion of maxilla covering root of canine.

Color.—Type: Upper parts of body, free ends of hairs similar to benzo brown, basal portions deep quaker drab, under parts of same general style of coloration but lighter, the free ends of the hairs becoming mouse-gray; the hairs about the head and upper parts of neck incline to buffy brown, ears and membranes blackish brown except tips of wings lighter.

Skull and teeth.—The skull for the most part is essentially like that of *Megaderma trifolium*, but is slightly heavier, especially about the rostrum, the roots of the canines are distinctly larger and heavier, but not nearly so enlarged as they are in *Megaderma lasiae*. The entire skull is distinctly smaller than that of the latter species. Aside from the enlarged roots of the canines the teeth of *Megaderma siumatis* are plainly like those of *M. trifolium*, and much smaller than those of *M. lasiae*.

Measurements.—Type: Head and body, 75 mm.; forearm, 59; tibia, 32; foot, 19; width of rostrum at apex, 22.5; condylobasal length, 10.4; maxillary toothrow, 9.5.

Specimens examined.—Three, all from Pulo Siumat.

Remarks.—In view of the closeness of Siumat to the large island Simalur it is not unlikely that *Megaderma siumatis* occurs on both islands. It may be rather closely related to Sumatran examples of *M. trifolium*, of which there are no specimens in the United States National Museum, comparisons having been made with Javan and Peninsular examples.

MEGADERMA NIASENSE, new species.

Type-specimen.—No. 141305, U.S.N.M., adult male, preserved in alcohol, collected on Pulo Nias (Mojeia River), March 15, 1905, by Dr. W. L. Abbott; original number 4066.

Geographic distribution.—Nias Island.

Diagnostic characters.—One of the smallest members of the genus, forearm 55 mm., greatest length of skull, 25.5; portions of maxillae covering roots of canines rather slender.

Color.—(Specimen dried from alcohol.) Tips of hairs of upper parts, hair brown to drab, bases of hairs deep quaker drab, hairs of underparts similar but in general lighter; membranes in general something like warm sepia, except for distinctly lighter tips of wings; ears same general color as membranes but lighter.

Skull and teeth.—The skull for the most part is essentially similar to that of *Megaderma trifolium*, but is slightly less heavy, with portion

of maxilla covering roots of canines less enlarged; zygoma more slender; audital bullae smaller; teeth are slightly smaller and toothrow shorter.

Measurements.—Type: Head and body, 65 mm.; forearm, 55; tibia, 32; foot, 17; width of rostrum at apex, 5.2; condylobasal length, 22.5; width of braincase, 10.3; maxillary toothrow, 9.2.

Specimens examined.—One, the type.

Remarks.—*Megaderma niasense* is apparently the smallest member of the genus. It is conspicuously smaller than the other species from the Barussan Islands, but the smallest individuals of *Megaderma trifolium* closely approximate it in size.

Family VESPERTILIONIDAE.

MYOTIS ABBOTTI, new species.

Type-specimen.—Preserved in alcohol, skull removed, adult female, No. 121611, U.S.N.M., collected on North Pagi Island, January 3, 1903, by Dr. W. L. Abbott; original number 2191.

Geographic distribution.—Only known on North Pagi Island, but probably occurring on South Pagi as well.

Diagnostic characters.—A member of the *muricola* group of *Myotis*, distinguished by its distinctly larger size.

Color.—Fur of upperparts with general effect of mummy-brown, bases of hairs blackish-brown, and showing through to a moderate extent; fur of underparts, light buffy-brown, with the blackish-brown bases showing through to a considerable extent; membranes and ears varying between natal and bone-brown.

Skull and teeth.—Compared with the skull of *Myotis muricola* (Sumatran specimens) the skull of *M. abbotti* is distinctly larger throughout and more angular, especially about the rostrum; the braincase is relatively more swollen than that of *M. muricola*. The teeth of *M. abbotti* are like those of *M. muricola*, only larger.

Measurements.—Type, and paratype No. 121610: Forearm, 38, 38 mm.; tibia with foot, 27, 26.5; tibia alone, 16.8, 17.2; ear from crown, 11.5, 11.5; condylobasal length of skull, 13.8, 13.5; interorbital constriction, 3.8, 3.8; width of braincase, 7.4, 7.4; maxillary toothrow, including canine, 5.5, 5.5.

Remarks.—*Myotis abbotti* appears to be a well characterized form, distinguishable at a glance from *M. muricola* by its longer forearm, greater size of skull, and more swollen braincase. Its great differentiation is in agreement with that of many of the other mammals of the Pagi Islands.

MYOTIS NIASENSIS, new species.

Type-specimen.—Preserved in alcohol, skull removed. No. 121876, U.S.N.M., adult female, collected by Dr. W. L. Abbott at Siaba Bay, Nias Island, March 20, 1903; original number 2402.

Geographic distribution.—Known only from Nias Island.

Diagnostic characters.—A small form of *Myotis muricola*. (Comparison with Sumatran examples.)

Color.—Fur of upperparts cinnamon-brown, the blackish-brown bases of the hairs showing through to a moderate extent; fur of underpart avellaneous, almost whitish under chin; dark bases of the hairs of underparts show through to a very considerable extent; membranes varying between natal and bone-brown; ears, tawny olive. The color of *Myotis niasensis* is distinctly lighter than that of either *M. muricola* or *M. abbotti*.

Skull and teeth.—Compared with the skull of *M. muricola* (Sumatran specimens) that of *M. niasensis* is distinctly smaller, though it has the same general shape; it lacks the roundness of braincase seen in *M. abbotti* and the angularity of the rostrum.

Measurements.—Type, paratype No. 121877 and an average specimen, No. 141134 of *Myotis muricola* from Tarussan Bay, Sumatra: Forearm, 31.2, 31.5, 34.5; tibia, including foot, 19, 18.5, 22.5; tibia alone, 14, 13.5, 16.4; ear from crown, 10.2, 9.8, 11; condylobasal length of skull, 12.6, 12.4, 13.3; width of braincase, 6.3, 6.4, 6.6; interorbital constriction, 3.2, 3.2, 3.2; maxillary toothrow, including canine, 4.6, 4.8, 5.2.

Remarks.—*Myotis niasensis* is a well-marked form of *Myotis muricola* but less highly differentiated than the *Myotis* from Pagi Islands. It is easily distinguished from the parent form by its smaller external cranial and dental measurements, and by its lighter color.

Order CARNIVORA.

Family VIVERRIDAE.

PARADOXURUS HERMAPHRODITUS ENGANUS, new subspecies.

1894. *Paradoxurus hermaphroditus*, THOMAS, Ann. Mus. Civ. Stor. Nat., Genova, ser. 2, vol. 14, p. 105.

1906. *Paradoxurus hermaphroditus*, MILLER, Proc. U. S. Nat. Mus., vol. 30, p. 820, June 4, 1906.

Type-specimen.—No. 141026, U.S.N.M., skin and skull of adult female (maxillary teeth much worn), collected on Engano Island, November 11, 1904, by Dr. W. L. Abbott; original number 3782.

Geographic distribution.—Engano Island.

Diagnostic characters.—A small form of the widely ranging *Paradoxurus hermaphroditus*, its size the same as that of *P. hermaphroditus parvus*, but distinguished by a less rounded brain case, somewhat smaller teeth, a longer (antero-posteriorly) upper canine, and probably by brown or lighter colored hind feet.

Color.—Aside from the feet the color of *Paradoxurus hermaphroditus enganus* does not differ from that of *P. h. parvus*. The single

specimen is of the brownish type of coloration. The brown color of the hind feet may be the result of wear as the brown hairs covering them look worn; the entire tail is brownish, but is obviously worn.

Skull and teeth.—Aside from certain differences these are essentially as they are in *Paradoxurus hermaphroditus parvus*, the distinguishing features being the conspicuous narrowness and less inflation of the brain case, the heavier mandibular condyle, the general smaller size of the teeth, and the greater antero-posterior diameter of the upper canine.

Measurements.—Type: Head and body, 495 mm., tail, 410; hindfoot, 77; condylobasal length, 97; zygomatic width, 53; width of brain case, 32; maxillary toothrow 35.6; width of brain case at level of coronal suture 25.4 mm., same measurement in an adult female of nearly equal age of *Paradoxurus hermaphroditus parvus*, 28.8.

Specimens examined.—One, the type.

ARCTICTIS NIASENSIS, new species.

Type-specimen.—No. 141230, U.S.N.M., imperfect pelt, collected on Nias Island in 1905 by Dr. W. L. Abbott; original number 3970. "Flat skin bought of native who had killed it in the hills near Fadoro, said not to be common."—W. L. A.

Diagnostic characters.—Distinguished from a fairly large number of Malay bear-cats by having tips of certain of the hairs of upper parts and the under parts ochraceous tawny instead of buff to ochraceous buff.

Color.—Upper parts of back of head, neck, body, and all of tail, brownish black, coarsely and rather sparsely grizzled with ochraceous tawny on the lower back, sides, outside of legs, and proximal two-thirds of tail; under parts tawny ochraceous.

Measurements.—Base of tail to ear, 580 mm.; tail, 540.

Specimens examined.—One.

Remarks.—The tawny coloration of the grizzling and of the under parts is not seen in a rather large series of Malay skins of *Arctictis binturong*, and there seems little doubt as to the distinctness of the Nias animal. It is a great misfortune not to have a perfect specimen, but imperfect as it is, it does not match any of the others. Dr. Abbott says that from the natives' descriptions of this animal it is undoubtedly a distinct form.

Order RODENTIA.

Family SCIURIDAE.

SCIURUS MANSALARIS BATUS, new subspecies.

Type-specimen.—Skin and skull of adult male, No. 121732, U.S.N.M., collected on Tana Bala, Batu Islands, February 4, 1903, by Dr. W. L. Abbott; original number 2217.

Geographic distribution.—Tana Bala and Tana Masa of the Batu Islands, and probably other islands of the same group.

Diagnostic characters.—A subspecies of *Sciurus mansalaris* with relatively dark upper parts, resembling those of *S. m. mansalaris*, but under parts distinctly washed with buffy, slightly more than in the case of *S. m. bancarus*; light subterminal annulation of long hairs of tail narrower and more buffy, and less whitish than in the case of the other two races.

Measurements.—Type: Head and body, 160 mm.; tail, 100; hind foot, 37; condylobasal length, estimated, 35; zygomatic width, estimated, 24; width of brain case, 18; maxillary tooth row, 7.

Specimens examined.—Six skins and skulls from Tana Bala, and two from Tana Masa.

Remarks.—This is a rather poorly characterized geographic race, somewhat intermediate in many respects between the typical form and *Sciurus mansalaris bancarus* Miller of Pulo Bankaru. The recognition of the others makes that of the Batu squirrel imperative, as it can not be perfectly associated with the Mansalar or Bankaru forms.

RHINOSCIURUS INCULTUS, new species.

1903. *Rhinosciurus laticaudatus*, MILLER, Proc. U.S.Nat.Mus., vol. 26, p. 458, February 3, 1903.

Type-specimen.—No. 114414, U.S.N.M., skin and skull, adult female, collected on Pulo Tuanku, Banjak Island, February 5, 1902, by Dr. W. L. Abbott; original number 1515.

Geographic distribution.—Known only from Pulo Tuanku.

Diagnostic characters.—Closely related to *Rhinosciurus tupaoides*¹ (Malay Peninsula, Singapore), *R. peracer*² (Perak), *R. leo*² (Singapore), *R. robinsoni*³ (Tioman Island), *R. rhionis*² (Rhio Archipelago), *R. laticaudatus*⁴ (Borneo); characterized by general dull, dark coloration; ochraceous buff fringe on tail, absence of shoulder stripe; dull buffy underparts, long, slender rostrum, moderate sized bullae, large teeth.

Color.—Upper parts, head, neck, and body, and outside of legs a mixture of blackish and ochraceous orange, the darker color much in excess, especially in middle of back, and the lighter color tending toward yellow ocher about the head and neck; underparts, including inside of legs, dull whitish or buffy, sparsely admixed with a few brownish hairs; tail with about the same colors as the back, but the light and dark elements very coarsely mixed and in about equal proportions, the light color of the tail becoming ochraceous buff, which forms a fairly well-defined fringe around it.

¹ Blyth, Journ. Asiat. Soc. Bengal, vol. 24, 1855, p. 477.

² Thomas and Wroughton, Ann. Mag. Nat. Hist., ser. 8, vol. 3, p. 440, May, 1909.

³ Thomas, Journ. Fed. Malay States Mus., vol. 2, p. 104, October 10, 1908.

⁴ Müller and Schlegel, Verh. Nat. Gesch. Nederl. Overz. Bezzit. Eekhoorns, 1842, pp. 87, 100, pl. 15.

Skull and teeth.—Skull large and long, with long, slender rostrum, bullae of moderate size; not unusually small or large, maximum length 11 mm., teeth large and heavy, maxillary toothrow 12.5; maximum width of toothrow, 3.2.

Measurements.—Type: Head and body, 230 mm.; tail, 130; hind foot, 45; condylobasal length, 53.8; zygomatic width, 28.3; width of braincase, 23; interorbital constriction, 13.4; maximum length of nasals, 22; maxillary toothrow, 12.5.

Specimens examined.—One, the type.

Remarks.—*Rhinosciurus incultus* is not a highly characterized form, and is here described as new largely because of inability to assign it to any of the numerous named forms of the original *Sciurus laticaudatus*. Material in the United States National Museum for making comparisons of this group is extremely meager, and the descriptions of some of the forms are lacking in detail. As nearly as can be made out from the descriptions the following are the characters of the other members of this group.

Laticaudatus, Borneo, light colored animal, with moderately large skull, rostrum and bullae.

Tupaoides, Singapore and Malay Peninsula, tail washed with white instead of buffy, belly white, flanks buffy.

Robinsoni, Tioman Island, tail washed with buffy, bullae smaller than in *laticaudatus*, and much smaller than in *tupaoides*.

Peracer, Perak, Malay Peninsula, tail washed with buffy, relatively small bullae, about as in *laticaudatus*.

Leo, Singapore, and Malay Peninsula, like *peracer*, but brighter colored, and with very large bullae, distinguishing it from all the others.

Leo rhionis, Karimon, Kunder, Batam, and Bintang Islands, like *leo* but with better shoulder stripes and more buffy underparts.

RATUFA PALLIATA BATUANA, new subspecies.

1908. *Ratufa palliata*, LYON, Ann. Mag. Nat. Hist., ser. 8, vol. 1, p. 137, February, 1908.

Type-specimen.—Skin and skull of adult male, No. 121707, U.S. N.M., collected on Tana Bala of the Batu Islands, February 11, 1903, by Dr. W. L. Abbott; original number 2263.

Geographic distribution.—Known only from Tana Bala and Tana Masa of the Batu Islands.

Diagnostic characters.—A form of *R. palliata* characterized by its smaller size and in the possession of *palliata* type of nasal and premaxillary, and not of the *laenata* type; that is, the posterior end of the nasals and of the nasal branches of the premaxillaries lie on about the same straight line and the combined anterior median projections of the maxillaries, not unusually narrow.

Color.—Type: In good pelage, top of head and neck and upper parts of sides of same, including ears, outer side of fore and hind legs and feet, blackish brown; back, shoulders to rump, brown, lightening to a buffy isabella color on sides; underparts including lower part of sides of head and neck and inner sides of forelegs, and a rather narrow portion of inner side of hind legs, cream color, sharply contrasted with the blackish of head, neck, and legs, and moderately contrasted with the isabella-colored sides; tail above, a coarse mixture of cream color and brownish, the lighter color much in excess except at base and tip; underside of tail similar, but the cream color more prominent at the edges and the dark brownish more conspicuous next to the median line, the median line being light ochraceous, slightly mixed with brownish.

Skull.—Relatively small, posterior edge of nasals and nasal branches of premaxillaries on same line, and combined anterior median projections of maxillaries, not unusually narrow.

Measurements.—Type: Head and body, 330 mm.; tail, 385; hind-foot, 80; condylobasal length of skull, 63; zygomatic width, 42; post-orbital constriction, 23; orbital constriction, 22; width of braincase, 29; maxillary tooththrow, 13.5; mandibular tooththrow, 14; weight, 3 pounds, equals 1.36 kilograms.

Specimens examined.—Five from Tana Masa and nine from Tana Bala Islands of the Batu group in United States National Museum, and three from Tana Masa in the British Museum. No ratufas of this group were collected on Pulo Pinie of these islands.

Remarks.—*Ratufa palliata batuana* is not a well-marked form, it is essentially an intermediate between the typical form and *R. p. laenata*, having the skull form of one and the size of the other. Three specimens from Tana Masa Island were identified by me in 1908¹ as "not quite typical of *Ratufa palliata*." At that time attention was called to their smaller size. The subsequent careful examination of two additional specimens from Tana Masa and nine from Tana Bala leaves no doubt as to the advisability of recognizing the Batu *palliata* giant squirrel as a distinct geographic race. They were called by Wroughton in 1910² *R. palliata laenata*.

Family MURIDAE.

RATTUS SIMALURENSIS LASIAE, new subspecies.

Type-specimen.—No. 114254, U.S.N.M., skin and skull of adult female, collected on Pulo Lasia, January 6, 1902, by Dr. W. L. Abbott; original number 1400

Geographic distribution.—Pulo Lasia.

¹ Ann. Mag. Nat. Hist., ser. 8, vol. 1, p. 137, February, 1908.

² Journ. Bombay Nat. Hist. Soc., vol. 19, p. 895, February 28, 1910.

Diagnostic characters.—Distinguished from the typical subspecies and the next by having a short, wide, heavy rostrum, temporal ridges better developed and more angular, upper parts in many specimens, with a tendency to be dark and blackish.

Color.—Essentially like that of *Rattus simalurensis simalurensis* (Miller) (1903a) aside from the tendency already mentioned to darkness on upper parts.

Skull and teeth.—The skull is distinguished by its heaviness and angularity, especially seen in the wide heavy rostrum, and the heavy angular temporal ridges. While these characters are those usually produced by age, yet they are not found in examples of *Rattus simalurensis simalurensis* of equal age. Young examples show a wider rostrum than is found in young examples of the Simalur and Siumat rat.

Measurements.—Type: Head and body, 231 mm.; tail, 225; hind foot, 42; condylobasal length, 47.8; zygomatic width, 24.4; brain case, 17.7; maxillary tooth row, 7.9.

Specimens examined.—Thirteen from Pulo Lasia.

RATTUS SIMALURENSIS BABI, new subspecies.

Type-specimen.—No. 114280, U.S.N.M., skull, without skin, of adult male, collected on Pulo Babi, January 13, 1902, by Dr. W. L. Abbott.

Geographic distribution.—Pulo Babi.

Diagnostic characters.—Similar to the rat of Pulo Lasia, but with a heavy elongated skull.

Color.—Skins of the two specimens collected were not saved, the labels accompanying the skulls read: "Large gray rat similar to that of Pulo Lasia" for Cat. No. 114280, and for the other specimen Cat. No. 114281, collected a day later, "Large brown rat similar to that of Pulo Lasia."

Skull.—The skull is heavy but lacks the breadth and angularity of that of *Rattus simalurensis lasiae*, rostrum is moderately long and slender, temporal ridges are not angular, but are well defined and are inclined to appear somewhat parallel.

Measurements.—Type: Head and body, 255 mm.; condylobasal length, 50.2; zygomatic width, 23; width of brain case, 17.4; maxillary tooth row, 8.3. The tail of the type-specimen was imperfect; what there was of it measured 205 mm., tail of the other specimen, 217.

Specimens examined.—Two skulls without skins.

RATTUS BALMASUS, new species.

Type-specimen.—No. 121765, U.S.N.M., skin and skull of adult female, collected on Tana Bala, Batu Islands, February 13, 1903, by Dr. W. L. Abbott; original number 2286.

Geographic distribution.—Islands of Tana Bala and Tana Masa.

Diagnostic characters.—A member of the *Rattus firmus* group distinguished by somewhat small size, short tail, more yellowish type of coloration, and skull relatively slender, especially rostral portion.

Color.—Upper parts and sides of head, neck, and body, and outside of legs a coarse grizzled mixture of blackish brown, and a color somewhat like cinnamon-buff, both colors about equally mixed, the lighter color perhaps slightly in excess along the sides. Under parts, including inner sides of legs, dirty cream color, stained artificially along the throat with a rusty tinge, hairs not slaty at base.

Skull and teeth.—The skull of *Rattus balmasus* averages somewhat smaller than that of most of the other members of the *firmus* group; it is relatively narrow and has a relatively slender rostrum.

Measurements.—Type: Head and body, 222 mm.; tail, 201; hind-foot, 44; condylobasal length, 47; width of brain case, 18; maxillary tooth row, 9.5.

Specimens examined.—Three from Tana Masa and 7 from Tana Bala.

Remarks.—This species is very closely related to *Rattus pinatus* of Pulo Pinie; the difference between the two being scarcely more than subspecific.

RATTUS PINATUS, new species.

Type-specimen.—No. 121778, U.S.N.M., skin and skull of adult male, collected on Pulo Pinie, Batu Islands, March 4, 1903, by Dr. W. L. Abbott; original number 2367.

Geographic distribution.—Pulo Pinie.

Diagnostic characters.—A member of the *Rattus firmus* group, distinguished by somewhat small size, rather short tail, more yellowish type of coloration, and skull with a rather heavy rostrum.

Color.—The color of this species is so exactly like that of *Rattus balmasus* from Tana Bala, and Tana Masa that no further remarks are needed.

Skull and teeth.—The skull of *Rattus pinatus* averages somewhat smaller than that of most of the other members of the *R. firmus* group and is marked by a wider, stouter rostrum.

Measurements.—Type: Head and body, 218; tail, 200; hind foot, 46; condylobasal length, 48.3; width of brain case, 18.5; maxillary tooth row, 9.6.

Specimens examined.—Five, from Pulo Pinie.

Remarks.—This species is very closely related to its relative of Masa and Bala Islands, both forms together constituting a group apart from the other members of the *firmus* group.

RATTUS LINGENSIS BANACUS, new subspecies.

1903. *Mus lingensis* MILLER, Proc. U. S. Nat. Mus., vol. 26, p. 463, February 3, 1903.

Type-specimen.—No. 114294, U.S.N.M., skin and skull of adult male, collected on Pulo Bankaru, Banjak Islands, January 19, 1902, by Dr. W. L. Abbott; original number 1434.

Geographic distribution.—Pulo Bankaru, Banjak Islands.

Diagnostic characters.—General coloration rather dull (light markings on hairs ochraceous buff to dull ochraceous orange; underparts dull whitish, apparently stained; collar nearly always present, dark and light colors of sides and underparts so mixed as to produce a coarse speckled effect.

Measurements.—Size slightly smaller; head and body of adults, 190 to 205 mm.; tail, 160 to 175; hindfoot, 40 to 43; condylobasal length of skull, 41 to 43; width of braincase, 16.4 to 16.8; maxillary tooththrow, 6.4 to 7.4.

Specimens examined.—Thirteen from Pulo Bankaru.

Remarks.—This rat is very similar to its relative on Tuanku but averages distinctly duller; from typical *Rattus lingensis* it is chiefly distinguished by the coarse speckled appearance of the upperparts and sides, and by its somewhat shorter tail.

RATTUS LINGENSIS ANTUCUS, new subspecies.

1903. *Mus lingensis*, MILLER, Proc. U. S. Nat. Mus., vol. 26, p. 463, February 3, 1903.

Type-specimen.—No. 114390, U.S.N.M., skin and skull of adult female, collected on Pulo Tuanku, Banjak Islands, January 28, 1902, by Dr. W. L. Abbott; original number 1484.

Geographic distribution.—Pulo Tuanku, Banjak Islands.

Diagnostic characters.—General coloration moderately bright (light markings on hairs ochraceous buff to ochraceous orange), collar nearly always lacking, underparts dull whitish, the coarse speckled effect of the Bankaru rat lacking.

Measurements.—Size slightly smaller; head and body, 175 to 205 mm.; tail, 135 to 160; hindfoot, 37 to 40; condylobasal length of skull, 38 to 43; width of braincase, 15.5 to 17; maxillary tooththrow, 6.5 to 7.2.

Specimens examined.—Eleven from Pulo Tuanku.

Remarks.—This rat is distinguished from its relative on Bankaru by its somewhat brighter color, less conspicuous coarse speckling; from *Rattus lingensis*, by its more marked speckling and by its distinctly shorter tail.

RATTUS LINGENSIS MABALUS, new subspecies.

Type-specimen.—No. 121825, U.S.N.M., skin and skull of adult female, collected on Tana Masa, Batu Islands, February 19, 1903, by Dr. W. L. Abbott; original number 2310.

Geographic distribution.—Tana Masa and Tana Bala, Batu Islands.

Diagnostic characters.—General coloration bright, but less so than in case of the Pinie rat (light markings on hairs ochraceous orange), light and dark colors of upperparts and sides so arranged as to produce coarse speckling, but dark color somewhat in excess, making animal appear darker than in case of the Pinie form; collar may or may not be present; underparts white.

Measurements.—Size moderate, head and body, 190 to 225 mm.; tail, 150 to 175; hindfoot 41 to 43; condylobasal length of skull, 40 to 44.5; width of braincase, 16.5 to 17.3; maxillary tooththrow, 6.5 to 7.2.

Specimens examined.—Five from Tana Masa and six from Tana Bala.

Remarks.—It is apparently impossible to distinguish between the *rajah* rats from Pulos Tana Masa and Tana Bala. Of the four skins from Masa two have complete collars, while in the other two it is barely indicated; both of the Bala skins have well-defined collars rather brighter than in the case of the two Masa specimens.

RATTUS LINGENSIS PINACUS, new subspecies.

Type-specimen.—No. 121846, U.S.N.M., skin and skull of adult female, collected on Pulo Pinie, Batu Islands, March 2, 1903, by Dr. W. L. Abbott; original number 2349.

Geographic distribution.—Pulo Pinie, Batu Islands.

Diagnostic characters.—General coloration bright (light markings on hairs ochraceous orange to zinc orange), light and dark colors of upperparts and sides so arranged as to produce coarse speckling, dark colors of upperparts less conspicuous and less blackish than in case of Masa and Bala specimens; underparts white, a collar present in only one out of four specimens at hand.

Measurements.—Size moderate, tail rather short; head and body, 190 to 230 mm.; tail, 140 to 160; hindfoot, 42 to 43; condylobasal length of skull, 40 to 45; width of braincase, 16.5. to 17; maxillary tooththrow, 7.2 to 7.5.

Specimens examined.—Eight from Pinie Island.

Remarks.—The rats of the *rajah* group found on the three islands, Pinie, Tana Masa, Tana Bala, of the Batu group, are closely related to each other, and practically constitute a form of *Rattus lingensis* by themselves, separable into two divisions, one on Pinie, and the other confined to the other two islands.

RATTUS FREMENS MANSALARIS, new subspecies.

1903. *Mus fremens*, MILLER, Proc. U. S. Nat. Mus., vol. 26, p. 463, February 3, 1903.

Type-specimen.—No. 114583, U.S.N.M., skin and skull of adult male, collected on Pulo Mansalar, off west coast of Sumatra, March 4, 1902, by Dr. W. L. Abbott; original number, 1591.

Geographic distribution.—Mansalar Island.

Diagnostic characters.—A dull colored member of the *Rattus vociferans* group, with the general color avellaneous, replacing the cinnamon-buff of *Rattus vociferans tapanulius*;¹ skull angular with thick, heavy rostrum, as compared with *R. fremens fremens*.

Color, etc.—Upperparts and sides of head, neck, and body, and outside of legs a mixture of dull cinnamon-buff and blackish; the darker color predominating along the middle line of head and back, the two about equally mixed along the sides and outside of legs producing the general effect of avellaneous. Underparts including inside of legs, varying from whitish to cream color. Tail, dull brownish, somewhat lighter on underside at base. Eight scales to the centimeter at center, each scale subtended by three light colored hairs about one and one-half scales in length.

Skull and teeth.—Skull, in comparison with *Rattus vociferans tapanulius* and *fremens fremens*, large, angular, heavy, particularly rostrum; temporal ridge beading well marked and angle of beading at frontoparietal suture conspicuous. Teeth show no essential differences from related members of the group.

Measurements.—Type: Head and body, 250 mm.; tail, 299; hind-foot, 47; condylobasal length, 51.5; zygomatic width, 25.5; width of braincase, 20; maxillary toothrow, 10.5. Tail rather short for the group; about 300 mm. or slightly less.

Specimens examined.—Seven from Mansalar Island.

Remarks.—In spite of the close proximity of this form to *Rattus vociferans tapanulius* of the adjacent mainland it is very closely related to *Epimys fremens fremens* Miller² of Sinkep Island, in its general characteristics. It is probably a case of parallel development.

RATTUS FREMENS TUANCUS, new subspecies.

1903. *Mus fremens* MILLER, Proc. U. S. Nat. Mus., vol. 26, p. 463, February 3, 1903.

Type-specimen.—No. 114402, U.S.N.M., skin and skull of adult male, collected on Pulo Tuanku, Banjak Islands, January 26, 1902, by Dr. W. L. Abbott; original number, 1470.

Geographic distribution.—Pulos Tuanku and Bankaru, Banjak Islands.

Diagnostic characters.—A dull colored member of the *Rattus vociferans* group very similar to *R. fremens mansalaris* above, but skull slenderer, less angular, with longer, slenderer rostrum, and differing from *R. fremens fremens* in its larger size of skull and relatively shorter tail.

¹ Lyon, Proc. Biol. Soc. Wash., vol. 29, p. 209, September 22, 1916.

² Proc. Acad. Nat. Sci. Philadelphia, 1902, p. 154, March, 1902.

Color, etc.—The color of *Rattus fremens tuancus* is essentially like that of *R. fremens mansalaris*; the number of scales on tail and arrangement of hairs are essentially the same in the two forms, but in each the tail is darker than it is in *R. fremens fremens*.

Skull and teeth.—Skull is large, slender in appearance, the rostrum particularly so, and the angle on the temporal ridge less conspicuous than it is in *Rattus fremens mansalaris*.

Measurements.—Type: Head and body, 257 mm.; tail, 328; hind-foot, 47; condylobasal length, 53; zygomatic width, 26.5; width of brain-case, 19.5; maxillary toothrow, 10.5. Tail has about the same absolute length as that of *Rattus fremens fremens*, and is slightly longer than that of *R. fremens mansalaris*, being about 325 mm. instead of 300 mm.

Remarks.—The two forms just described were recognized as constituting a heterogenous group by Mr. Miller (1903a) who said of them: "This series shows variation in both size and color."

Order PRIMATES.

Family LASIOPYGIDAE.

PITHECUS MANSALARIS, new species.

1903. *Macacus "cynomolgus"* MILLER, Proc. U. S. Nat. Mus., vol. 26, p. 476, February 3, 1903.

Type-specimen.—No. 114560, U.S.N.M., skin and skull of adult male, collected on Mansalar Island, March 10, 1902, by Dr. W. L. Abbott; original number 1639.

Geographic distribution.—Mansalar Island.

Diagnostic characters.—A geographic form of *Pithecus fascicularis*, of the same general plan of coloration except that the upper part of head, neck, and body are of a general bright amber brown color and upperpart of tail is slightly darker.

Skull and teeth.—These show no distinguishing features.

Measurements.—Type: Head and body, 440 mm.; tail, 500; hind-foot, 125; condylobasal length, 88.5; braincase width, 55; postorbital constriction, 39.5; maxillary toothrow, 34.2; weight, 11 $\frac{3}{4}$ pounds (5.1 kilos).

Specimens examined.—Three from Mansalar Island, two skins with skulls and one skull without skin. One of the skins is without tail; "Tail shot off." W. L. A.

Remarks.—The bright coloration of *Pithecus mansalaris* is quite striking when compared with the specimens from Tapanuli Bay, only a few miles distant.

PITHECUS FUSCUS LASIAE, new subspecies.

1903. *Macacus fuscus* MILLER, Proc. U. S. Nat. Mus., vol. 26, p. 476, February 3, 1903. Type-locality: Simalur.

Type-specimen.—No. 114248, U.S.N.M., skin and skull of adult male, collected on Pulo Lasia, January 5, 1902, by Dr. W. L. Abbott; original number, 1398.

Geographic distribution.—Pulo Lasia.

Diagnostic characters.—Essentially like the typical *Pithecus fuscus*, except that black of back of neck and upper part of back is slightly more conspicuous; tail decidedly longer than head and body and more than 500 mm. in length.

Skull and teeth.—These show no characters to distinguish the Lasia race from that inhabiting the larger island.

Measurements.—Type: Head and body, 470 mm.; tail, 555; hind-foot, 135; condylobasal length, 96; width of braincase, 58; postorbital constriction, 39; maxillary toothrow, 40; weight, 14 pounds (6.3 kilos).

Specimens examined.—The type and an immature male.

Remarks.—*Pithecus fuscus lasiae* is a slightly modified form of *P. fuscus*. The material on which it is based is not entirely satisfactory as to numbers, but the long tails of the two specimens are not equalled by any of the eleven from Pulo Simalur. This peculiarity of the Lasia specimens was pointed out by Miller in 1903.

Order ARTIODACTYLA.

Family SUIDAE.

SUS BABI TUANCUS, new subspecies.

1903. *Sus vittatus*, MILLER, Proc. U. S. Nat. Mus., vol. 26, p. 446, February 3, 1903.

1906. *Sus babi* MILLER, Proc. U. S. Nat. Mus., vol. 30, p. 752, June 13, 1906.

Type-specimen.—No. 114415, U.S.N.M., skin and skull of adult female, collected on Tuanku Island, January 9, 1902, by Dr. W. L. Abbott; original number 1412.

Geographic distribution.—Pulo Tuanku, Banjak Islands.

Diagnostic characters.—Distinguished by its short nasals, 127 mm., short premaxillary bones, 93 mm. (less than 100) and long nutrient artery groove in frontal bone, 35 to 40 mm.; color of type, dark—that is, blackish—but with a fair amount of buffy grizzling, especially along sides, neck, and rump; a second specimen is conspicuously grizzled throughout.

Measurements.—Type: condylobasal length, 268 mm.; tip of nasals to lambdoid notch, 283; greatest length of nasals, 127; width of nasals at base, 31; greatest length of premaxillary, 93; external nutrient groove or frontal bone (chord) 40; upper premolar-molar series, 101; second upper molar, 18 by 17; third upper molar 28 by 19.

Specimens examined.—Two, skins and skulls from Tuanku Island.

Remarks.—Geographically this pig ought to be closely related to *Sus vittatus*, but its general appearance and rather wide rostrum show its affinities with *Sus babi*. All the pigs of this group are rather closely related, but the forms from Babi, Tuanku, and Engano seem to form a group in contradistinction to the others.

SUS BABI ENGANUS, new subspecies.

1906 ? *Sus babi* MILLER, Proc. U. S. Nat. Mus., vol. 30, pp. 752, June 13, 1906, and 820, June 4, 1906.

Type-specimen.—No. 140959, U.S.N.M., skull of very old female, collected on Engano Island November 30, 1904, by Dr. W. L. Abbott; original number 3814.

Geographic distribution.—Engano Island.

Diagnostic characters.—Intermediate in characters between *Sus babi babi* and *S. babi tuancus*; nasals long, 140 mm.; and premaxillary long, 115 mm., as in the Babi form; nutrient artery groove on frontal long, 39 mm., as in the Tuanku pig; color of type unknown; of a young male, almost entirely blackish.

Measurements.—Type: Condylbasal length, 267 mm.; tip of nasals to lambdoid notch, 293; greatest length of nasals 140; width of nasals at base, 33; greatest length of premaxilla, 115; external nutrient groove on frontal bone (chord), 39; premolar-molar series, 99; second upper molar, 16 by 16; third upper molar, 29 by 19.

Specimens examined.—Skull of an old female, and skin and skull of a young male from Engano Island.

Remarks.—The status of this pig is very unsatisfactory. In 1906, Mr. Miller was not satisfied to call it *Sus babi* without a query. It is unlike any other pig on the Barussan Islands or west coast of Sumatra. It seems to be closer to *Sus babi babi* than to *S. b. tuancus*. Whatever the origin of the Engano pig, it is clearly not the same as the other Barussan pigs and it seems more satisfactory to describe it as a new form than to try to place it with some other. In his field notes Doctor Abbott writes of the Engano pig: "Pigs are very common in Engano; they are never kept tame. They are said to be descended from some pigs which swam ashore from stranded ship. This was only 25 (?) years ago. Previously the natives said none existed." I do not wish to discredit the natives' story of the Engano pigs, but there is no zoologic and geographic reason why pigs should not occur as native animals on Engano as well as on the Nicobars, Simalur, and Babi. It is not unlikely that the pigs reached all these outlying islands by human agency. It would seem incredible that they should be the only large animal on so many small islands unless brought by man. Doctor Abbott thinks the natives may have had the stranded-ship story handed down from generation to generation and that the years refer to the observation of the first generation.

Family TRAGULIDAE.

TRAGULUS NAPU NIASIS, new subspecies.

Type-specimen.—No. 141171, U.S.N.M., skin and skull of adult male (molar teeth much worn) collected at Kwala Mojeia, Nias Island, March 4, 1905, by Dr. W. L. Abbott; original number 3979.

Geographic distribution.—Nias Island.

Diagnostic characters.—A form of *Tragulus napu* distinguished by its slightly smaller size, lighter weight, and distinctly shorter hind foot.

Color.—The color of *Tragulus napu niasis* shows no differences from that of *T. napu napu* of Sumatra.

Skull and teeth.—These show no essential differences from those of the typical subspecies; they perhaps average slightly smaller.

Measurements.—Type: Head and body, 515 mm.; tail, 75; hind foot 137; condylobasal length, 101; zygomatic width, 51; width of brain case, 34; premolar-molar series, 35; weight 7½ pounds (3.3 kilos). The greatest weight of *Tragulus napu niasis* is 8 pounds (3.6 kilos) as contrasted with 9½ pounds (4.2 kilos) of *T. napu napu*. The hind foot of adults varies from 135 to 142 mm. in the Nias form, while in the Sumatran animal it ranges from 145 to 152 mm.

Specimens examined.—Eight, all from Nias.

Remarks.—No specimens of *Tragulus* were collected in Nias by Modigliani, and none were taken by Doctor Abbott on his first visit to the island in 1903. In his notes on the second voyage to Nias in 1905 with reference to *Tragulus* Doctor Abbott says: "The *napu* were mostly caught by a native living at Batuto near the Kwala Mojeia. They were all caught by driving into the water (creeks) with dogs. The one from Samasama (No. 141170) was caught in a 'lapun.' No kanchil exists."

TRAGULUS PINIUS, new species.

1903. *Tragulus russulus* MILLER, Smiths. Misc. Coll., vol. 45, p. 3, November 6, 1903. (Specimens from Pinie.)

Type-specimen.—No. 121837, U.S.N.M., skin and skull of subadult male (molar teeth slightly worn, last deciduous premolar in place), collected on Pulo Pinie, March 3, 1903, by Dr. W. L. Abbott; original number 2362.

Geographic distribution.—Pulo Pinie.

Diagnostic characters.—A fairly large member of the *kanchil* group distinguished among the Barussian kanchils by a general buff-yellow or antimony coloration, with only a moderate admixture of blackish brown.

Color.—Upperparts and sides of head, neck, and body, a coarse mixture of buff-yellow or antimony to almost dull ochraceous orange

and blackish or brownish black; along middle line of back the two colors about equally mixed, for a short narrow space on top of neck the blackish color exists almost alone and gradually blends in with the back posteriorly, laterally it is sharply separated from the nearly pure ochraceous orange of sides of neck; on sides of body the light buffy colors predominate; outside of legs rather darker than dull ochraceous orange. Underparts and narrow stripe on innerside of legs white, belly being suffused along middle line with ochraceous buff; collar ochraceous buff, and V similar but slightly admixed with brownish.

Skull and teeth.—These show no special peculiarities.

Measurements.—Type: Head and body 460 mm.; tail, 70; hind-foot, 125; condylobasal length, 90.7; zygomatic width, 42.5; width of braincase, 31.5; premolar-molar series, 36.3; weight, 4½ pounds (2 kilos.)

Specimens examined.—Two, from Pinie.

Remarks.—*Tragulus pinius* appears to be a well marked species. Its peculiarities were pointed out by Mr. Miller in 1903. Both of the specimens were labeled by him "*T. russulus?*". In color it is like *T. brevipes*, but is larger, with less of a nape stripe. It appears to be a much lightened form of *T. russulus*, but intergrading specimens are lacking.

TRAGULUS RUSSULUS MASAE, new subspecies.

Type-specimen.—No. 121813, U.S.N.M., skin and skull of adult female, molar teeth moderately worn, collected on Tana Masa Island, February 18, 1903, by Dr. W. L. Abbott; original number 2306.

Geographic distribution.—Tana Masa Island.

Diagnostic characters.—A very brightly colored race of *Tragulus russulus* with almost a lack of nape stripe, somewhat heavier, 6¼ pounds (2.8 kilos); slightly longer toothrow.

Color.—Upperparts, sides of head, neck and body, and outside of legs in general, xanthine orange, slightly admixed with blackish on upperparts, blackish element being concentrated to produce a slight nape patch. Underparts in general and stripe on innerside of legs, white with some light xanthine orange suffusions on belly; collar and throat V, xanthine orange, slightly lined with blackish.

Skull and teeth.—Aside from a longer toothrow these show no peculiarities.

Measurements.—Type: Head and body, 500 mm.; tail, 75; hind-foot, 122; condylobasal length, 92.8; zygomatic width, 45; width of braincase, 32.5; premolar-molar series, 36.2; weight, 6¼ pounds (2.8 kilos). The single specimen from Tana Masa is larger and heavier than any from Tana Bala.

Specimens examined.—One, the type.

Remarks.—*Tragulus russulus masae* is a slightly differentiated form and shows an extreme development in color of kanchils found on Tana Bala, as represented by the type of typical *T. russulus*. None of the six specimens from Tana Bala are so lacking in a nape patch as is *T. r. masae*.

LIST OF ISLANDS VISITED BY DOCTOR ABBOTT, 1901 TO 1905, AND SPECIES OF MAMMALS COLLECTED ON EACH.

SIMALUR ISLAND.

November 18 to December 19, 1901, October 23 to 28, 1902.

Paradoxurus hermaphroditus parvus Miller (1913).

Rattus simalurensis simalurensis Miller (1903a).

Rattus concolor surdus Miller (1903a).

Pithecus fuscus fuscus Miller (1903a).

Sus mimus Miller (1906c).

SIUMAT ISLAND, EAST OF SIMALUR.

December 27, 1901, to January 1, 1902.

Megaderma siumatis Lyon (1916).

PULO LASIA, SOUTH OF SIMALUR.

January 4 to 7, 1902.

Megaderma lasiae Lyon (1916).

Rattus simalurensis lasiae Lyon (1916).

Pithecus fuscus lasiae Lyon (1916).

PULO BABI, SOUTH OF SIMALUR.

January 8, 9, and 14, 1902.

Cynopterus babi Lyon (1916).

Emballonura monticola Temminck.

Megaderma lasiae Lyon (1916).

Rattus simalurensis babi Lyon (1916).

Sus babi babi Miller (1906c).

PULO BANKARU, BANJAK GROUP.

January 16 to 21, 1902.

Sciurus mansalaris bancarus Miller (1903a).

Sciurus pretiosus Miller (1903a).

Rattus valens (Miller) (1913).

Rattus lingensis banacus Lyon (1916).

Tragulus brevipes Miller (1903a).

PULO TUANKU, BANJAK GROUP.

January 23 to February 6, 1902.

Tana tana tuancus Lyon (1913).

Galeopterus tuancus (Miller) (1903a).

Sciurus ubericolor Miller (1903a).

- Rhinosciurus incultus* Lyon (1916).
Ratufa palliata laenata Miller (1903a).
Ratufa femoralis Miller (1903a).
Rattus potens (Miller) (1913).
Rattus batus (Miller) (1911).
Rattus lingensis antucus Lyon (1916).
Rattus fremens tuanacus Lyon (1916).
Pithecus agnatus Elliot (1910).
Sus babi tuancus Lyon (1916).
Tragulus russeus Miller (1903a).

MANSALAR ISLAND.

March 2 to 14, 1902.

- Sciurus mansalaris mansalaris* Miller (1903a).
Sciurus saturatus Miller (1903a).
Ratufa nigrescens Miller (1903a).
Rattus domitor (Miller) (1903a).
Rattus catellifer (Miller) (1903a).
Rattus fremens mansalaris Lyon (1916).
Pithecus mansalaris Lyon (1916).
Tragulus amoenus Miller (1903a).
Tragulus jugularis Miller (1903a).

NIAS ISLAND.

March 16-30, 1903; February to March 11, 1905.

- Cynocephalus major* Miller (1906a).
Cynocephalus princeps Miller (1906a).
Cynocephalus minutus Miller (1906a).
Pteropus niadicus Miller (1906a).
Macroglossus minimus minimus (E. Geoffroy) (Andersen, 1912).
Emballonura monticola Temminck.
Megaderma niasense Lyon (1916).
Rhinolophus trifolius niasensis Andersen (1906).
Rhinolophus circe Andersen (1906).
Hipposideros larvatus.
Hipposideros sp.
Hipposideros sp.
Myotis niasensis Lyon (1916).
Arctictis niasensis Lyon (1916).
Rattus maerens (Miller) (1911).
Rattus concolor concolor (Blyth).
Rattus batus (Miller) (1911).
Rattus barussanus (Miller) (1911).
Chiropodomys niadis Miller (1903b).
Manis javanica Desmarest.
Pithecus phaeura (Miller) (1903b).
Sus niadensis Miller (1906c).
Tragulus napu niasis Lyon (1916).
Cervulus moschatus (Blaineville).
Rusa equina (Cuvier).

TANA BALA, BATU ISLANDS.

February 2 to 14, 1903.

- Tupaia tephrra* Miller (1903b).
Tana cervicalis cervicalis (Miller) (1903b).
Galeopterus saturatus (Miller) (1903b).
Hipposideros sp.
Sciurus balae Miller (1903b).
Sciurus mansalari batus Lyon (1916).
Sciurus ictericus Miller (1903b).
Lariscus rostratus Miller (1903b).
Ratufa palliata batuana Lyon (1916).
Ratufa balae balae Miller (1903b).
Petaurista batuana batuana Miller (1903b).
Rattus balmasus Lyon (1916).
Rattus batus (Miller) (1911).
Rattus lingensis mabalus Lyon (1916).
Rattus masae balae (Miller) (1903b).
Pithecius fascicularis (Raffles).
Pygathrix batuana (Miller) (1903b).
Tragulus batuanus Miller (1903b).
Tragulus russulus russulus Miller (1903b).

TANA MASA, BATU ISLANDS.

February 17 to 23, 1903.

- Tana cervicalis masae* Lyon (1913).
Emballonura monticola Temminck.
Sciurus mansalari batus Lyon (1916).
Sciurus ictericus Miller (1903b).
Ratufa palliata batuana Lyon (1916).
Ratufa balae masae Miller (1903b).
Petaurista batuana batuana Miller (1903b).
Rattus balmasus Lyon (1916).
Rattus batus (Miller) (1911).
Rattus lingensis mabalus Lyon (1916).
Rattus masae masae (Miller) (1903b).
Pithecius fascicularis (Raffles).
Pygathrix batuana (Miller) (1903b).
Tragulus batuanus Miller (1903b).
Tragulus russulus masae Lyon (1916).

PULO PINIE, BATU ISLANDS.

February 28 to March 8, 1903.

- Ptilocercus lowii continentalis* Thomas (Lyon, 1913).
Cynopterus brachyotis (Müller) (Andersen, 1912).
Sciurus piniensis Miller (1903b).
Sciurus ictericus Miller (1903b).
Ratufa balae piniensis Miller (1903b).
Petaurista batuana batuana Miller (1903b).
Rattus pinatus Lyon (1916).
Rattus batus (Miller) (1911).
Rattus lingensis pinacus Lyon (1916).
Pygathrix batuana (Miller) (1903b).
Tragulus pinius Lyon (1916).
Galeopterus saturatus (Miller) (1903b).

SIBERUT ISLAND.

January 22, 1903.

Emballonura monticola Temminck.

NORTH AND SOUTH PAGI ISLANDS.

November 11, 1902, to January 14, 1903.

Tupaia chrysogaster Miller (1903*b*).
Cynopterus brachyotis (Müller) (Andersen, 1912).
Pteropus vampyrus malaccensis Andersen (1912).
Myotis abbotti Lyon (1916).
Paradoxurus lignicolor Miller (1903*b*).
Hemigalus minor Miller (1903*b*).
Sciurus pumilus Miller (1903*b*).
Sciurus atratus Miller (1903*b*).
Lariscus obscurus Miller (1903*b*).
Sciuropterus maerens Miller (1903*b*).
Rattus lugens Miller (1903*b*).
Rattus neglectus, subspecies.
Rattus pagensis (Miller) (1903*b*).
Rattus soccatus (Miller) (1903*b*).
Manis javanica Desmarest.
Pithecius pagensis (Miller) (1903*b*).
Pygathrix potenziiani (Bonaparte) (Thomas, 1894*b*).
Simias concolor Miller (1903*b*).
Symphalangus klossi Miller (1903*b*).
Rusa equina (Cuvier).

ENGANO ISLAND.

November and December, 1904.

Pteropus modigliani Thomas (1894*a*).
Pteropus hypomelanus enganus Miller (1906*b*).
Rhinolophus calypso Andersen (1905).
Hipposideros, species.
Pipistrellus macrotis Temminck.¹
Kerivoula engana Miller (1906*b*).
Paradoxurus hermaphroditus enganus Lyon (1916).
Rattus enganus Miller (1906*b*).
Sus babi enganus Lyon, 1916).

¹ Mr. Oldfield Thomas (Ann. Mag. Nat. Hist., ser. 8, vol. 15, p. 229, February, 1915) has lately suggested that *Pipistrellus curtatus* is perhaps identical with *P. tralatitius*. This is not the case, however. In the United States National Museum there are examples of *P. tralatitius* from Java, *P. imbricatus* from Java, *P. kitcheneri* from Borneo, as well as the unique type of *P. curtatus*. The three latter species seem to constitute a group by themselves, apart from *P. tralatitius*, distinguished by their broad short rostrums. *P. curtatus* is the smallest of the three. It is proportionally smaller than *P. imbricatus*, than *P. imbricatus* is smaller than *P. kitcheneri*. Owing to its shortened rostrum it is even smaller than *P. tralatitius*. *Pipistrellus curtatus*, however, does not appear to be distinguished from a series of *Pipistrellus* from Tarussan Bay, Sumatra, and for the Sumatran bat Thomas seems to have correctly shown that Temminck's name *Vespertilio macrotis* is available (Monographies de Mammalogie, vol. 2, p. 218, 1835-1841).

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