

# MAMMALS COLLECTED BY DR. W. L. ABBOTT ON BORNEO AND SOME OF THE SMALL ADJACENT ISLANDS.

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## INTRODUCTION.

Before collecting on the mainland of Borneo, Dr. W. L. Abbott made two expeditions to adjacent islands, the mammalian fauna of which is closely allied to that of Borneo. One of these expeditions was to the Natuna Islands, north of Borneo, and was made during the spring and summer of 1900; the other was to the Karimata Islands, off the west coast, during August and September, 1904. Lists of the mammals obtained on these expeditions were published by Mr. Gerrit S. Miller, jr., in 1901 and in 1906.<sup>1</sup> More recently Doctor Abbott has visited the mainland of Borneo five times, on each occasion stopping at some of the adjacent islands. An account of the mammals collected on the first trip to the mainland, covering the Kapuas River region, was published by me in 1907.<sup>2</sup> The present paper aims to give an account of the mammals obtained on the remaining four expeditions—two to southwestern Borneo and two to southeastern Borneo—as well as those collected in the near-by islands. For the sake of completeness, I have included in the present paper the species collected in the Kapuas River region, as well as those from Karimata Islands, the latter having been visited a second time. Four short papers<sup>3</sup> have appeared recently which

<sup>1</sup> Proc. Wash. Acad. Sci., vol. 3, pp. 111-138, March 26, 1901. Proc. U. S. Nat. Mus., vol. 31, pp. 55-66, July 23, 1906.

<sup>2</sup> Proc. U. S. Nat. Mus., vol. 33, pp. 547-572, December 24, 1907.

<sup>3</sup> Lyon, Description of a new squirrel of the *Sciurus prevostii* group from Pulo Temaju, west coast of Borneo. Smiths. Misc. Coll., vol. 48, pp. 275-276, February 4, 1907.

Lyon, Remarks on the Insectivores of the genus *Gymnura*. Proc. U. S. Nat. Mus., vol. 36, p. 449, May 27, 1909. Doctor Abbott's Bornean specimens listed.

Elliot, On the genus *Presbytis* Esch., and *Le Tarsier* Buffon, with descriptions of two new species of *Tarsius*. Bull. Amer. Mus. Nat. Hist., No. 28, pp. 151-154, May 27, 1910. Describes the tarsier from the Kapuas River region.

Elliot, Descriptions of some new species of monkeys of the genera *Pithecus* and *Pygathrix* collected by Dr. W. L. Abbott and presented to the United States National Museum. Proc. U. S. Nat. Mus., vol. 38, pp. 343-352, August 6, 1910. Describes the common macaques from Karimata, the Kapuas River region, Bawean Island, and Pulo Mata Siri.

deal in part with the mammals included in the present paper, but the collections as a whole are here published for the first time.

A list of the localities visited by Doctor Abbott is given below, together with his geographical and natural history field-notes. Many of these localities are not to be found on the ordinary maps, and reference should be made to the maps on pages 55 and 57.

LIST OF LOCALITIES, WITH GEOGRAPHICAL AND NATURAL HISTORY FIELD-NOTES BY DR. W. L. ABBOTT.

WEST BORNEAN MAINLAND, JUNE 6-September 16, 1907.

*Sukadana (or Sukudana).*—At Sukudana a mass of hills 1,000 to 2,000 feet high rise right from the seashore. They are well forested, but there are many plantations of durians and other fruit upon their slopes and many clearings in the neighborhood. The sea is very shallow near the coast; otherwise it would have been a good collecting ground for me,<sup>1</sup> as animal life is abundant in the neighborhood. The inhabitants are all Malays except a few Chinese traders and small planters.

*Sempang River.*—The country along the Sempang River is low and swampy, very little above high water, as is also nearly all west Borneo near the coast. The lower part of the principal affluent, the Semandang, is also low and flat. The headwaters of both rivers are among the hills. The low country is for the most part heavy forest, with a strip of clearing along the river banks. The hilly country is inhabited by Dyaks and here there is comparatively little virgin forest remaining. The greater part of the surface is covered with secondary jungle. A few rhinoceroses are said to inhabit the upper Sempang about Batu Dayeu (or Dajeuh). A much larger cat than *Felis nebulosa* occurs, called by Malays and Dyaks "rimow." It must be very rare, as very few people whom I met had ever seen it. The big red pig (*Sus gargantua?*) I heard of from both Dyaks and Malays, especially about the upper Sempang River, but not reported at all common.

*Matan (or Matai) River.*—The Sungei Matan enters the Sempang at the rajah's kampong (village) called Sempang. I camped about 12 miles up (4½ hours) at a place called Matan. Formerly there was a large kampong there but it was abandoned twenty to thirty years since. Most of the neighborhood is large secondary jungle. The hill called Matan was close by. Animal life was very abundant, and orang-utans plentiful. There are no permanent villages now upon the Sungei Matan, except on the slopes of the hill called Sepunchok, about 2½ hours above Sempang, where there are eight families.

*Mount Palung.*—Palung is 1,110 meters in height. I ascended Panti and remained one night; saw no mammals high up. Panti [not shown on map] is one of the hills of Palung. It is somewhere about 3,500 feet. Rhinoceroses are said to inhabit the lowlands about the base of Palung. No tapir or banting (*Bos*) in this part of Borneo.

SOUTHWEST BORNEAN MAINLAND, JUNE 17-September 29, 1908.

*Kendawangan River.*—The country along the lower Kendawangan River, as elsewhere in west Borneo, is mostly swamp, just above high-water mark. Occasional higher patches and tracts occur which always remain dry and are called "pēmátong," about what we call "islands" in swamps or "hummocks" in Florida. There are no hills close to the lower river except at Mankol. At Lanchut, 30 miles from the mouth, there is quite a large tract of dry land extending back to Mount Kedio, 4 miles from the river. About Kalang Anyer, a Malay kampong of three houses, 70 miles from the mouth, the banks become higher, with but little swamp. A few miles higher up the hilly and rolling country is reached, the Dyak country, where most of the original jungle has been destroyed and now covered with secondary jungle, scrub, and "alang

<sup>1</sup> Doctor Abbott travels about in a schooner, and the anchorage probably was poor.

along" (long coarse grass). On the upper part of the largest tributary, the Mambuluh, there are many "danau," or lakes, which, however, dry up in time of drought. There are several hundred Malays living along the lower Kendawangan, Lobo Batil, 18 miles

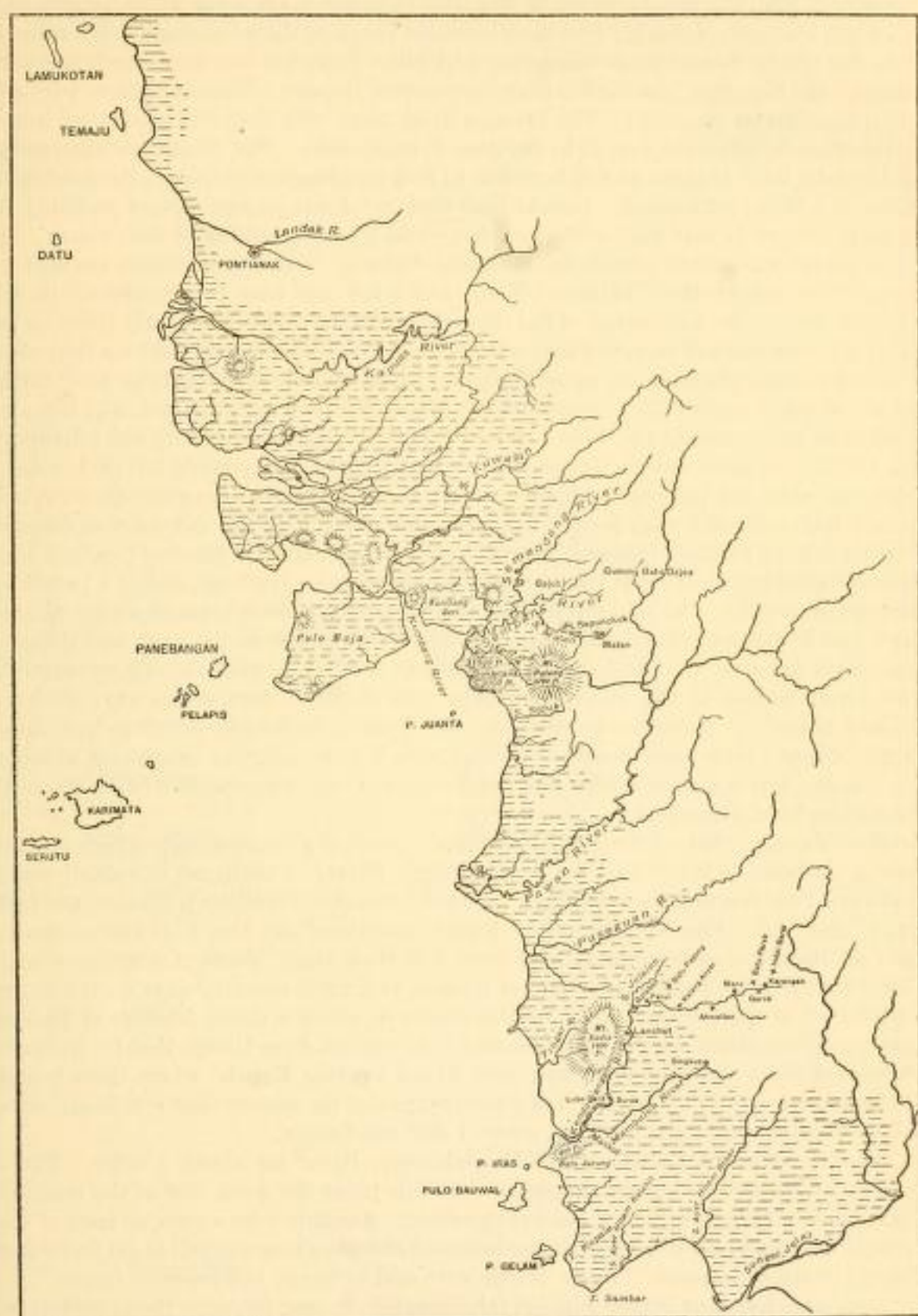


FIG. 1.—MAP OF SOUTHWESTERN BORNEO.

from the mouth, being the highest permanently inhabited place. The rattan and gutta gatherers wander all over the forests and the uninhabited belt lying between the Malay settlements and the Dyak country on the hilly ground, and they all carry guns

with them. On the upper Kendawangan among the Dyaks there are about 200 Malays, mostly about Maro. Nearly every man, both Dyak and Malay, has a gun; so game is remarkably scarce. Luckily, powder is difficult to obtain. The Dutch have not interfered with the natives much as yet, and have not taken away their firearms, as they are gradually doing all over their colonies, much to the advantage of the animal life, for Dyaks devour everything they can kill. I myself saw very much less life than on the Sempang, and far less than in southeast Borneo, where the natives were all disarmed several years ago. The Dyaks kill far more with their "bétantik," or spear traps, than by shooting, except in the case of orang-utan. The Dyaks are extremely fond of the meat of these, and it is useless to look for oranges anywhere in the neighborhood of a Dyak settlement. I could hear nothing of *Sus gargantua*, and probably it does not occur in that part of Borneo, nor could I hear anything of the "rimau," or tiger, which was said to inhabit the Sempang district. A few rhinoceroses are said to inhabit the neighborhood of Mount Kedio and a few sapi utan (*Bos sondaicus*) on its west slopes on the headwaters of the little river Tingar. This is the only place on or near the west coast of Borneo where wild cattle occur. The Malays told me they also existed in some places on the upper Pasaguan River—that is the next large river north of the Kendawangan. The country about Mount Kedio is uninhabited, and there is said to be much animal life there. Fifty or sixty years ago the district was inhabited by Dyaks, but these, becoming involved in war with the Malay rajah, left their homes and fled into the interior. All over this corner of Borneo occur slightly elevated sandy tracts covered with small trees (or smaller trees than the surrounding forest); these are locally called "padang," which is Malay for meadow. Much of this land and a good deal of the drier forest was burned over six or seven years ago, during a period of excessive drought. No rain fell for four or five months, a most unusual occurrence in any part of Borneo, where ordinarily rain falls every month in the year, and there is no proper dry season. The following animals, in addition to some already mentioned, were well known to the natives, but none was obtained during this trip: *Mydaus*, called bóbot by Malay and kalinsída by Dyaks; *Reithrosciurus*; *Felis nebulosa*, rimau dahan; *Felis marmorata*?, a wild cat with a large tail, was caught by a Malay in a snare, but for some reason was not brought to me; *Paradoxurus philippinensis*; *Gymnura*, local name ángkis.

*Batu Jurong*.—Batu Jurong is the southerly point of a range of hills which stretch north-northeast to Mankol on the Kendawangan River. I anchored in a small strait between Pulo Iras and the mainland. Two or three Malay families lived here and had their clearings. Pigs were plentiful; kijang (muntjacs) and rusa were also common, but the Malays were continually after them with their dogs. South of this there are no inhabitants in the southwest corner of Borneo, and until recently none on the south coast west of the Sungei Jelai. Lately, however, about a dozen families of Malays have made clearings on the lower course of the Sungei Ayer Hitam Besar. Animals were said to be plentiful, especially rusa, about Tanjong Kepala, where there is said to be large tracts of short grass. I saw two oranges and the sarongs (nests) of many more about 2 miles east of Batu Jurong, where I shot one female.

*Mankol*.—Mankol lies along the Kendawangan River for about 2 miles. There are about 25 or more houses altogether. At this point the north end of the range of hills (400 to 800 feet high) approaches the river. Animals were scarce, as most of the people had guns, and the jungle in the hills and along the base was full of old jerats and pagars (traps and snares). A few oranges were said to occur, but I saw no traces.

*Lanchut*.—Lanchut is now without inhabitants. It was formerly the most important village on the river and the residence of the rajah. The ground along the river is quite high and dry and covered with secondary jungle and long grass for some distance back from the river. Four or five miles due east rises Mount Kedio, in an uninhabited district covered with heavy forest.



ancient island, joined to the mainland by the elevation of the land and also by silting up a wide tract of mangrove swamp lying in the intervening space. As one ascends the river, a few miles from the bay, evidences of elevation become everywhere visible in the masses of limestone coral projecting from the swampy surface. In many cases the flat surface of the ancient reef is but a few inches below the mud or actually on the surface. A little farther an irregular line of limestone hills, mostly with precipitous and waterworn sides, runs in a general direction parallel with the coast. The uncleared land is all heavy forest. Many old clearings and some new exist in the neighborhood of the rivers. The population of the coast is made up of Bugis, Banjer, and other Mohammedan Malay tribes. Inland is a large Dyak (pagan) population. The Dutch annexed this district in 1905.

*Pangkallahan (or Bangkallaan) River.*—Kampong Pangkallahan is about 7 miles up the river of the same name and is the residence of the *mankoh*, or head of the Dyaks of the district. The country is covered with splendid forest, with only a few clearings. There are ranges and scattered hills of precipitous limestone rock. Animals seemed scarce, as usual in Dyak districts, everything hunted off or driven away by the Dyaks and their dogs. They have very few guns and no powder. About a half mile above the village is the lower entrance to the Temmelung or tunnel of the Pangkallahan. This tunnel cave, through which the river flows, swarms with bats as well as with edible birds'-nest swifts, hundreds of thousands of their nests being collected annually. I could not devise any way of catching the bats, as I had no net and had not brought a gun for fear of a capsizing, there being a dangerous rapid near the lower end of the tunnel. The Temmelung must be about 2 miles long, judging by the time we took passing through it. It is through limestone rock. I do not think the roof was anywhere very thick, at some places only 2 or 3 yards. That part of the country is full of limestone hills and rocks all honeycombed with caves and passages. But bats did not seem to be present in the hundreds of holes I visited, except an occasional individual which I could not secure. Judging from the noise, for the light from the torches did little but accentuate the gloom, there must be hundreds of thousands in the Temmelung. Another tunnel occurs farther up the same river, but I did not visit it, as it was said to be very difficult of passage except by a very small canoe.

*Saratok River.*—The Saratok is a small river flowing into Klumpang Bay. Two Dyak houses stood in a small new clearing. Back of this and extending eastward for nearly 2 miles was a large tract of *alang alang* (tall, coarse grass) covering several hundred acres. There appeared to be a good many *rusa* here, but the grass, 4 to 5 feet high, made it very difficult to shoot anything. When the grass is burned off in the dry season the place is said to be frequented by a herd of *sapi utan* (*Bos sondaicus*). There were no tracks of these at the time of my visit. Most of my collecting was done near some limestone hills and rocks about a mile westward in the midst of splendid forest. Only the red *Presbytis* was seen here; near the coast only the black one existed.

Besides the animals shot in Klumpang Bay I saw the long-tailed and the pig-tailed macaques and *Presbytis cristata*.

PAMUKANG OR TJENGAL BAY, March 17–April 7, 1908, and March 23–April 13, 1909.

Musangs were generally scarce except the *tangalunga*, which was common. I let most of those go which I caught in traps. The *Mydaus* was well known, but no specimens were obtained. *Gymnura* must be very common, as one often smelt them in the jungle, although none were obtained. The pig-tailed macaque was twice met with in droves, but none were secured. I met with *Reithrosciurus* twice on Bukit Batu. It was running on the ground in heavy forest. Its movements were so quick I could not shoot it. Its big bushy tail, carried high over its back, made the animal very conspicuous. I was much surprised to find that it is a ground squirrel. The headman of the Bajaus at Sungei Manungul, Pamukang Bay, said there used to be some rhinos in that locality, but he had seen no traces for years.

PASIR RIVER, December 31, 1908–January 22, 1909.

BALIK PAPAN BAY, February 1-February 24, 1909. Balik Papan Bay extends nearly 18 miles in a northerly direction. Several rivers empty into it. The eastern shore is high and hilly for the most part, the western low and covered with mangroves. There were very few inhabitants when the Royal Dutch Oil Company first established its headquarters here about fifteen years ago. Now there is a large settlement, wharves, oil refineries, paraffin works, etc., and about 6,000 inhabitants, situated on the eastern entrance to the bay. It is an excellent harbor. The shores of the bay are still mostly heavy forest. The line of the bay probably coincides with that of a fault. The hills are mostly red laterite, but a line of limestone stretches southwestward not far from the head of the bay. Animal life is fairly plentiful. Banting (*Bos sondaicus*) were said to occur especially around the head of the bay.

PULO LAMUKOTAN, May 7-10, 1907. Pulo Lamukotan is the largest of the Burong Islands, and lies about 10 miles off the mainland of Borneo. It is about 4 miles long by 1 mile wide. It consists of a long ridge with a low rock near the middle of the island. The highest point is near the southern end and is nearly 1,000 feet in height. Most of the surface is now cleared and the lower parts entirely planted with coconuts, which are very fine and healthy. The only heavy forest remaining covers the highest summit and the crest of the ridge on the southern part of the island, and a smaller piece on the summit of the northern ridge. The soil seems fertile and the surface is not very rocky, except upon the shore. The forest trees are very large in the remaining jungle. The other islands in the group, four in number, are smaller and have been entirely cleared and planted with coconuts. The inhabitants are Malays from Sambas. A *Sciurus vittatus*, a *Macacus cynomolgus*, a large pig, and three or more rats constitute the mammalian fauna. Pigs are not now very numerous, having been largely hunted off by Chinese from the mainland, who employ dogs. Pigs were formerly very abundant upon the other islands of the group (Penata and Kebun), but have been entirely exterminated upon these since the clearing of the jungle. Rats seemed pretty common. My traps were set in the jungle on the ridge near the highest peak. Fruit pigeons and Nicobar pigeons were fairly common.

PULO TEMAJU, May 5-6, 1907. (First visited by Doctor Abbott in 1905.) Pulo Temaju is now mostly cleared and planted with coconut. The only heavy forest remaining covers the summit and upper slopes of the highest peak. There are no mammals except *Sciurus proserpinæ* and rats. The coconut trees are not very productive and seem much diseased.

PULO DATU, May 2-4, 1907. Pulo Datu lies 21 miles from the coast of Borneo. It is about 1½ miles long by three-fourths mile wide. It is very hilly (mountainous) and rocky, and rises to about 1,000 feet. It is covered with heavy forest, except at some places on the east side, where some clearings have been made and a few coconuts planted. The clearings are now overgrown with large secondary jungle, as the rats swarm to such an extent it is impossible to grow anything. Squirrels (*Sciurus vittatus* group) were plentiful. No monkeys. I put out about forty rat traps one night. Nearly every one was sprung in the morning, but many of the rats had been devoured by land or hermit crabs. White fruit pigeons and Nicobar pigeons were common. There are no sand beaches, but plenty of fresh water flows out beneath the rocks, on the east side at any rate, between high and low water marks. *Mus "rattus"* appeared to be more abundant than *M. "lingensis,"* but the hermit crabs showed marked preference for the latter and spoiled most of those caught.

PULO PANEBANGAN, May 16-26, June 2-3, and September 20-21, 1907. Pulo Panebangan lies 8 miles from Pulo Maja, which is practically the mainland of Borneo. It is about 4 miles long by 2 to 3 wide, containing about 6,000 to 7,000 acres. It is very hilly, scarcely any level ground. The highest point is said to be 1,700 feet. It is uninhabited and covered with dense jungle. Rattans (of an almost valueless variety) abound, and the jungle is so matted up with rattans and their flagella as to be impenetrable. In some places the jungle seems to have been cleared at some

previous period, as at the head of the small bay on the north side. *Macacus cynomolgus* was the only monkey seen. There is no lotong (*Presbytis*). The ratufa is probably fairly common, as I frequently heard it. I only actually saw the three which were shot. I thought I saw and heard *Nannosciurus* on one occasion, but am not certain. There is no napu or large tragulus. No deer occurs; no otter tracks seen; and the tangalunga trapped was the only musang seen. The small *Hipposideros* was very common, flying about in the daytime; the larger one was less common. There were several other species of bats flying about in the forest in daylight, but I failed to secure any. No *Rhinolophus* were seen. Another musang is said to occur and also a red flying squirrel. Pigs were plentiful. All those noticed upon the beach seemed to be males. We did not once see a small one out of two or three dozen individuals. Possibly the old males appropriate the beaches and reefs, which are the best feeding grounds, and drive away intruders. The pigs were all very lean and gaunt. Up to the present there are no inhabitants, although there are many durians, mangos, and chempadak. We heard that some Karimata people propose to come in July, 1907, and form plantations.

PULO PELAPIS, May 29-June 1, 1907. Pelapis, a group of four islands, lies  $3\frac{1}{2}$  miles southwest of Panebangan and 17 miles from Karimata. The islands are all hilly and rocky and covered with forest. The highest point is about 1,200 feet. The total area is about 5,000 acres. South Island (also called Pelapis Tengah) is the largest and is nearly  $2\frac{1}{4}$  miles long. All collecting was done upon this island. Some years ago some Malays and Karimata people settled upon South Island and farmed some plantations of coconuts, etc., but three years ago an epidemic broke out, many died and the rest of the settlers fled, and to-day scarce a trace of human occupancy can be seen. Besides the animals obtained, the flying lemur and the common long-tailed macaque occur. No tragulus, no musangs, or no ratufas occur. The pigs come out upon the sand beaches and reefs at low tide, and can be shot without much difficulty. Bats were flying about in the forest on Pelapis, but not nearly so many as upon Panebangan. None were obtained.

KARIMATA ISLANDS, Telok Edar, Karimata Island, October 4-7, 1908. (First visited by Dr. W. L. Abbott in 1905.)

PULO JUANTA, September 10-11, 1907. Pulo Juanta is a small island,  $6\frac{1}{2}$  miles from the mainland, about 1 kilometer long by  $\frac{1}{2}$  wide. It is about 300 feet high. The greater part is covered with heavy forest, but a clearing was made about four years ago and an attempt made to plant coconuts, but nothing could be grown owing to the rats and pigs. About thirty pigs were killed, but many remained. There are still a few on the island, but I could neither shoot nor trap them. There are no squirrels on the island.

PULO BAUWAL, June 12-16, 1908. Pulo Bauwal (or Rendezvous Island) lies near the southwest corner of Borneo. It is about 15 miles from Tanjong Sambar, which is the extreme southwest point. Bauwal is about 6 geographic miles long by 5 in extreme width and contains about 12,000 acres. The strait separating it from the mainland is from 4 to 6 miles wide and 4 to 12 fathoms deep. The island is surrounded by wide coral reefs and hard rocks. The island is composed of hard red rock (iron ore?) and is rather low. There are two or three hills, rising to about 300 feet to the tops of the trees. The surface is rolling and covered with forest. There is some mangrove swamp. A house, inhabited by Pontianak Malays, is on the east coast, and five houses inhabited by Orang Laut from Karimata were established near the northwest corner about three years ago. The fauna is rather peculiar in that there are no squirrels, traguli, rusa, or pigs. Muntjacs and tangalungas are common.

SOLOMBO (not shown on map), December 4-6, 1907. The island of Solombo, or Masolombo Besar, is about 4 miles long by about 2 wide. The surface is mostly rather low and rolling, and there is one hill about 250 feet high. The rock seems to be nearly all volcanic, except, of course, the coral around the shore. The island is surrounded



by a coral reef. It lies midway between Madura and Borneo, 84 miles to each. There is quite a large population, 300 to 400 of Bugis and Madurese. The island has been settled about forty years. Most of the heavy forest has been cleared, except about the hill. The soil, dark red, with many stones and rocks of lava upon the surface, is very fertile, and produces large crops of paddy and maize. The only mammals I saw were flying foxes, which were quite common. Rats were said to be plentiful. There are no monkeys or squirrels. There are said to be many sapi or feral cattle (*Bos sondaicus*), and the natives were very anxious for me to go and shoot some, but I did not have time to do so. They are said to have been running wild a long time. Birds are very plentiful. The anxiety as to the safety of my schooner prevented me from doing as much as I would have liked, besides cutting short my stay, for the wind went around to the northwest and we had to get out on short notice. I should like to have put in several more days and visited Pulo Solombo Kitchil. There are no people upon the latter and it is still uncleared forest. Birds are said to be very plentiful there.

BAWEAN ISLAND, November 24-27, 1907. (Not shown on map.) Bawean Island lies about 60 miles north of the Straits of Madura. It is about 11 miles long by 10 wide, the area being about 100 square miles. The surface is mountainous, several of the hills rising from 2,000 to 2,200 feet. The island is volcanic, the rocks being mostly lava and basalt, with some limestone. There are extensive coral reefs around the coast. Many volcanic cones are scattered about and there are several hot springs. A beautiful lake of about 15 acres called the Telaga occupies the extinct crater of the mountain of the same name. The island is densely inhabited around the coasts, the population being about 50,000. Most of the men go to Java, the Straits, and Sumatra in search of work. Nearly all the saises in Singapore and Penang are Beyanese. One sees but few males between the ages of 18 and 40 in Bawean. The women weave the mats of pandanus, for which the island is famous, and which are exported all over the archipelago. Animal life is not plentiful. Remarkably few birds are to be seen. As for mammals, pigs are very common. The only ones obtained, however, were young—too small to be of any use as specimens. The rusa (*Cervus kuhli*) is not numerous, and is only found in a few localities. The only specimens obtained were three pairs of horns from the kampong of Tombak on the north side of the island. It is more numerous on the hills behind Tombak than at any other place. There is also a porcupine, possibly two species, a musang, a *Manis*, and what appears to be an otter, but they do not seem to be common, and none were obtained. *Pteropus* was very common, but no other bats were seen. The cattle are the tame variety of *Bos sondaicus*, which has been introduced from Bali. They are not used for milk, but are employed to some extent for draft and plowing. A few buffaloes are also kept. There is but little virgin forest left upon Bawean. The largest piece lies upon the northern slopes of the central mountain mass, especially Gunong Besar and the Telaga. There is also a tract upon the west coast which I did not visit, however, and there are some small patches on the eastern and southern slopes of the mountains. The rest of the island is to a great extent covered with small scrub and giant bamboos. Mangos and jack fruit escaped from cultivation form much of the jungle. The scrub is everywhere traversed by the trails formed by the numerous cattle.

ARENDS (or KERAMIAN) ISLAND, November 24, 1908. (See map, p. 57.)

PULO MATA SIRI, December 7-11, 1907, and November 25-December 1, 1908. Mata Siri is the largest of the Laurot or Laut Kitchil Islands. It is  $7\frac{1}{2}$  miles long by  $1\frac{1}{2}$  broad, is 1,400 feet high. There is scarcely any level ground, the whole island being hilly, consisting of a long ridge dividing into two peninsulas at its northeast end, inclosing the bay of Telok Sungei. It is a good, safe harbor, and we lay there in security, although the westerly monsoon was blowing strong at the time. The other two islands of the group, Kalambau and Kadapangan, are each about one-half the size of Mata Siri, and each consists of one long ridge. The islands are of granite

formation, with but little coral reef around them. Rats of one species were very plentiful; a very pale *Sciurus vittatus* was common, so was the ordinary long-tailed macaque. I shot one *Pteropus* and a pair of *Cynopterus*, also another bat (*Megaderma?*), but it was lost in the jungle. A muntjac (or kijang) is common, but I only had a glimpse of one. As the island is covered with dense unbroken jungle it is almost impossible to shoot them. The animal only occurs on Mata Siri. It is possible it may have been introduced by man. We heard them barking daily, and they must be very numerous. None of the group is permanently inhabited, but Malays visit the islands from Pulo Laut and Pasir to collect turtles' eggs and birds' nests. Evidently there have been some clearings and cultivations in the past, as there is secondary jungle in some places which is now almost indistinguishable from the original forest. My crew saw a dugong in the bay.

PULO LAUT, December 16-29, 1907. Pulo Laut is a large island lying at the southeast corner of Borneo. The strait separating it is about 30 miles long and from 1 to 3 miles wide. The depth is 4 to 10 fathoms. The island is 55 geographic miles long by 20 wide. The north end is very hilly, the highest points being about 2,300 feet. Most of the rest of the surface is comparatively flat, with isolated hills. There is a large population of Bugis and Banjer people. The higher hills are still mostly covered with heavy forest, but much of the lower land has been cleared for paddy and pepper cultivation. This last is the staple production of the island. Some coal is mined in the hills at the north end. Kota Baru, near the northern entrance to the strait, is the seat of the Dutch Kontroleur of the district, and is quite a busy little place. The mammals of Pulo Laut are as follows: *Rusa* and *Sus barbatus*, both common; some very big pig (*Sus gargantua?*) said to occur; there is said to be a large red flying squirrel; napus were common, and a smaller kanchil was said to be less common, but I did not see it; *Bos sondaicus* may be truly wild (not feral) on Pulo Laut, as it is common on the opposite mainland; it is said to be numerous on Pulo Bira Birahan on the south coast of Pulo Laut; it is only one mile long and must have been introduced there. Gibbons, *Nasalis larvatus*, pig-tailed macaques, and *Mydaus* do not occur on Pulo Laut.

PULO SEBUKU, December 31, 1907-January 5, 1908. Pulo Sebuku lies east of Pulo Laut, from which it is separated by a shallow strait only a mile wide in some places. The strait about the middle has only about a foot of water at low tide. Sebuku is 17½ geographic miles long by about 5 wide. The highest point is only about 400 feet and the whole island is low but not swampy. The surface is mostly rolling. The inhabitants are mostly Bugis and Banjer people. It is thinly inhabited and the surface is still covered with heavy forest. The soil is red. Some black pepper is grown, and billian wood is cut. The Bugis build small praus here. As the strait separating Sebuku from Laut is so shallow, particularly at the northern end, I had to anchor the schooner near the northern end of the island, between the northwest point and the small coconut-covered island of Manti. Here we lay a mile offshore, just afloat at low tide. Rats were very plentiful in the jungle, *Sciurus "vittatus"* common; so was the ratufa, which seems much the same as that of Pulo Laut, but is a little smaller. The ordinary long-tailed macaque is the only monkey. A small napu is very common, although I secured but one pair. Pigs and rusa occur, and musangs are said to occur, although I did not meet with them. No tupaias were noticed.

DESCRIPTIONS OF SPECIES, WITH CRITICAL ANNOTATIONS  
AND LISTS OF SPECIMENS.

## MANIS JAVANICA Desmarest.

1907. *Manis javanica*, LYON, Proc. U. S. Nat. Mus., vol. 33, p. 548, December 24, 1907.

Two specimens from Pontianak, collected in 1905.

## BOS SONDAICUS Schlegel and Müller.

1839-1844. *Bos sondaicus* SCHLEGEL AND MÜLLER, Verh. Nat. Gesch. Nederl. Bezitt., p. 197, pls. 35-39.

Two specimens, skins and skulls, from Pamukang Bay—an adult female, Cat. No. 154385, collected in 1909, and a female calf, Cat. No. 151865, collected in 1908. The general body color of the adult lies between Ridgway's hazel and chestnut; a conspicuous narrow black stripe extends down the back from behind the shoulders to base of tail; from the base of the neck to the beginning of the black stripe there is an inconspicuous reddish stripe due to a general brightening of the general body color; the general color effect of the head and neck is something between russet and wood brown; the underparts are almost blackish; the "stockings," buttock patch, inside of ears, and the chin vary from dirty white to cream-buff; the tail is long-haired, the upper two-thirds being of the body color, the terminal third blackish. The calf is similarly colored to the adult, but much duller, so that the general effect is much like russet. The colored illustrations of *Bos sondaicus* by Schlegel and Müller are good representations of the present specimens except that the adult female in the plate is rather dull.

Measurements of the adult female: Head and body, 2,060 mm.; tail, 670; hind foot, 560; height at shoulder, 1,280; at rump, 1,310; weight of cut-up carcass without entrails, 386 pounds (175 kilos); estimated live weight, 500 pounds (227 kilos); basal length of skull, 405 mm.; condylo-basal length, 434; zygomatic width, 175; maxillary toothrow, 128; mandibular tooth row, 135.

This was quite common about Pamukang Bay, and I wasted much time in trying to get a specimen. Twice I was close to herds containing good bulls, but all my heavy rifle cartridges had gone bad. The cartridges had been five years on the *Terrapin* [Doctor Abbott's schooner] and the caps would not explode. To what extent these cattle are indigenous and to what extent, if any, feral, it is impossible to say. They are also found wild upon Pulo Laut, and even it is said on the small island of Bira Birahan, near the south end of Laut. They could not have been indigenous on that little island, only a mile long. At the present day very few cattle are kept by the natives. But the praus from Madura and Bali bring up many Bali cattle for beef every year. These and the wild ones look just alike.—W. L. A.