

**MAMMALS COLLECTED IN EASTERN SUMATRA BY DR.
W. L. ABBOTT DURING 1903, 1906, AND 1907, WITH
DESCRIPTIONS OF NEW SPECIES AND SUBSPECIES.**

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INTRODUCTION.

During the last eight years Dr. W. L. Abbott has visited various localities along the eastern coast of Sumatra for the purpose of making collections of natural history and of ethnology, all of which he has presented to the United States National Museum. Mammals and birds have constituted by far the greater part of the zoological collections. The following paper is a systematic account of the mammals that he has obtained in the general region of eastern Sumatra. Thirteen new species and three new subspecies are described in it.

Doctor Abbott's first visit to eastern Sumatra was in August and September, 1901. At that time he ascended the Indragiri River (see map, page 623) for a short distance and made collections of mammals from along its banks. This collection, together with material gathered during the same year from the near-by islands of the Rhio-Linga Archipelago, was described in 1902 by Mr. Gerrit S. Miller, Jr.* It is not treated of in the following pages except in an incidental manner.

The next visit of Doctor Abbott to eastern Sumatra was in August and September, 1903, when he made a small collection from along the banks of the Kateman River, a stream not far from the Indragiri which had been visited two years before. He again made a trip to the east coast of Sumatra during the period from November 15, 1905, to February 12, 1906, to Aru Bay (see map, page 621). From there he proceeded down the coast for about 250 miles to the strait, known as Salat Rupert, between Pulo Rupert and the mainland of Sumatra.

* Mammals collected by Dr. W. L. Abbott in the region of the Indragiri River, Sumatra, Proc. Acad. Nat. Sci. Philadelphia, March, 1902, issued June 11, 1902, pp. 143-150.

(See map, page 623.) From February 24 until April 3, 1906, he collected on Pulo Rupert, on the mainland opposite, on the small island of Payong in Salat Rupert and on the large islands of Bengkalis and Padang. (See map, page 623.) During the autumn of the same year Doctor Abbott visited that part of Sumatra again for a period of nearly five months, October, 1906, to February, 1907. He made collections from along the banks of the Siak and the Little Siak rivers, from the islands of Merbau, Tebing Tinggi, Rangsam, and Penjalei, as well as from the mainland of Sumatra opposite them. (See map, page 623.) The mammals of these several collections are described in detail below. Several preliminary notices of some of the specimens have already been printed, but the collections as a whole are treated of here for the first time. Reference to the earlier papers will be found in the synonymies of the species to which they refer.

In 1889 Dr. F. A. Jentink,^a director of the Leyden Museum, published a short paper on a collection of mammals made in eastern Sumatra by Dr. B. Hagen. In 1905 Mr. Gustav Schneider^b published a detailed account of his travels in eastern Sumatra and the mammals which he collected there. The names applied by these authors to the various species of mammals in eastern Sumatra are given under the synonymies of the species listed below.

DESCRIPTIONS OF LOCALITIES.

The following account of the localities visited by Doctor Abbott are taken almost entirely from his letters and field notes, and a study of the maps of the region.^c

Aru Bay.—(Map, page 621.) This is a small indentation on the east coast of Sumatra at about longitude $98^{\circ} 15'$ E. and latitude $4^{\circ} 10'$ N. One fresh water river, the Besitan, flows into it. In addition to that several tidal creeks empty into it. The shores of the bay and the rivers generally are fringed with mangroves. A short distance back from the rivers the country is rolling. A rather large island, Pulo Sembilan, is at the entrance to the bay.

The shooting ground was the peninsula between the lower Besitan River and the smaller Sungai Tongkam. This was covered to a great extent with heavy forest, through which many paths and roads had been made by the Chinese

^a On a collection of mammals from East-Sumatra, Notes Leyden Museum, XI, pp. 17-30, January, 1889.

^b Ergebnisse zoologischer Forschungsreisen in Sumatra. Erster Teil. Säugetiere (Mammalia). Gesammelt und bearbeitet von Gustav Schneider in Basel. Zool. Jahrb. Syst., XXIII, pp. 1-172, pls. 1-III, sketch maps 1 and 2.

^c Especially, Atlas van Nederlandsch Oost-Indië, bij het topographisch bureau te Batavia samengesteld in de jaren 1897-1904. (Ongewerkte uitgave van den atlas van J. W. Stenfoort en J. J. Ten Siethoff.) Bij de topographisch inrichting te 's Gravenhage gereproduceerd in de jaren 1898-1907, onder leiding van den Directeur C. A. Eckstein uitgegeven van het Departement van Koloniën.

woodcutters. These, however, had only taken the best trees of three or four species and the rest of the jungle was undisturbed.

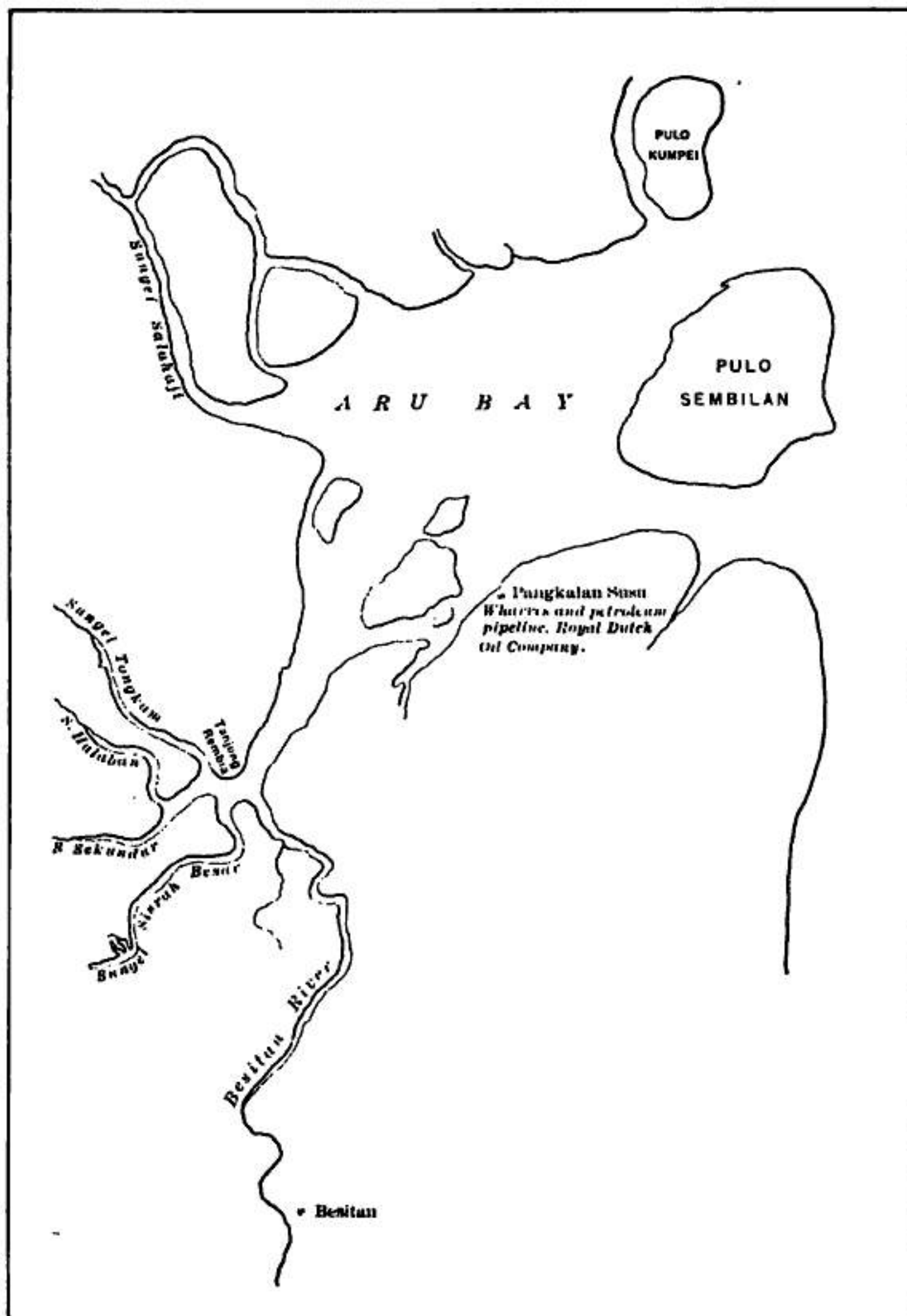


FIG. 1.—MAP OF ARU AND VICINITY.

There were many old clearings and tracts of lalang [long coarse grass] and scrub jungle, besides some new clearings and pepper gardens. I remained at this anchorage opposite Tanjong Remba from November 17 to December 8, 1905.

The Tongkam River joins the Besitan at Tanjong Kramet. [Tanjong Rembia on map.] The schooner anchored about 4 miles up the Tongkam, which is a tidal creek lined with mangroves. The principal collecting ground was the left bank of the Tongkam. There were a few kebuns and old clearings, but the country was mostly forest, intersected in all directions by the roads of the Chinese woodcutters. There was plenty of heavy original forest. The surrounding country is mostly rolling hills and ridges about 80 to 120 feet high. I remained at the anchorage in the Sungai Tongkam from December 8, 1905, to January 8, 1906. I also shot over the country about the headwaters of the Tongkam, which is covered with heavy forest extending from the Tamiang River [belonging to a watershed just to the north, not included or shown on the map, page 621]. Saw many fresh tracks of rhinoceros here. But a Malay who had a gun was continually after them, until, before I left, I could find no more fresh tracks. About a dozen Malays had made a clearing at the head of canoe navigation on the Tongkam.

I was anchored in the Sungai Halaban from January 11 to 28, 1906, about 4 miles up. The shooting ground was usually the peninsula between the Halaban and the Tongkam, which was rolling country mostly covered with heavy forest. There were many roads made by the Chinese woodcutters.

February 1 to 9, 1906, was spent in the upper part of the Besitan River, about 14 miles up from the kwala [mouth of river]. The country was hilly and covered with magnificent unbroken forest. Animal life was not plentiful. There were no habitations beyond about two hours above Besitan Station.—W. L. Abbott.

Salat Rupert.—This is the narrow strait between Pulo Rupert and the mainland of Sumatra. Its average width is about 3 miles and its depth at the upper part is about 5 fathoms and at the lower part decreases to 3 fathoms.^a

The mainland of Sumatra along Salat Rupert is low and swampy during the rains. The shore is mostly covered with secondary scrub and jungle, but back a short distance the country is all heavy forest. Tigers are abundant and elephants are said to be found at the time of rains. I saw many of their trails. The country is completely tracked up with pigs, tigers, *Rusa*, and many other animals, but the denseness of the jungle prevents one from catching sight of the larger game.—W. L. Abbott.

Pulo Payong.—See map, page 623.

Is an island about 4 miles long, in the Salat Rupert. It is low and swampy and largely covered with "Nibong" palms.—W. L. Abbott.

Pulo Rupert.—See map, page 623.

Pulo Rupert is the largest of the islands in the straits of Malacca, lying near the east coast of Sumatra, from which it is separated by the Salat Rupert, 2 to 3 miles wide and 10 to 15 fathoms deep. The whole island is low and flat, and swampy in the rainy season. The surface is nearly all covered with virgin forest. Some clearings exist along the coast and on the Salat Morong which separates it from Pulo Medang. Including Pulo Medang, this island forms a circle 26 geographic miles in diameter. The inhabitants number 2,000 or 3,000.

^a Directory Indian Archipelago and Coast of China by Alexander George Findlay. London, 1889, p. 53.

and consist largely of a primitive tribe called Orang Akit. They are much mixed with the Malays, however. There are a few Chinese.

In addition to the mammals obtained, *Sus oi* and *Rusa* are common. A few bears are said to exist. *Ratufa* is said to exist, but I never saw or heard them. *Gymnura* and a wild cat also occur. Dugongs are said not to be rare

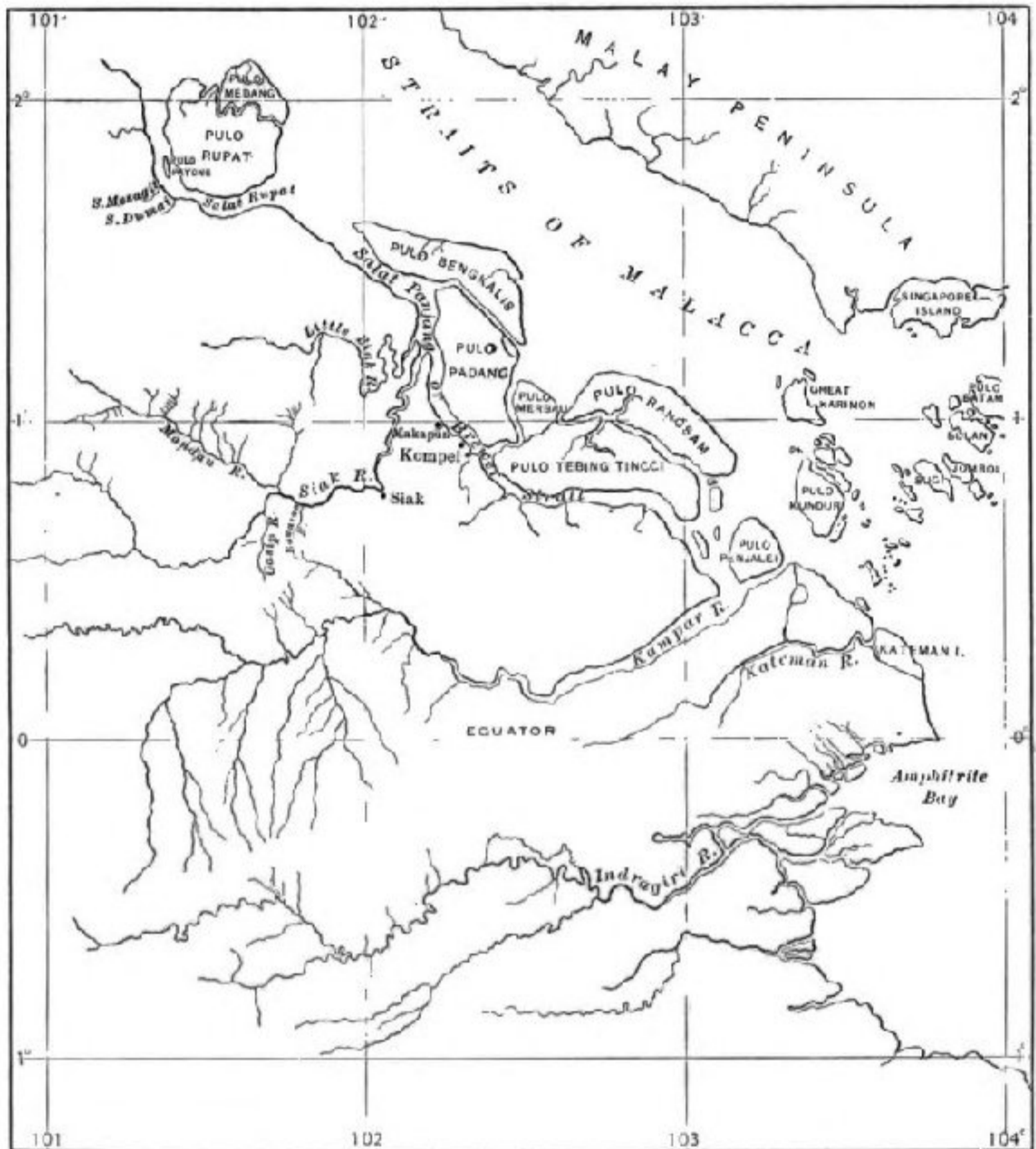


FIG. 2. —MAP OF PORTION OF EAST COAST OF SUMATRA.

in the Salat Rupert. Tigers never occur in Rupert, nor do elephants or rhinoceroses cross the strait, although they are all common upon the mainland.—W. L. Abbott.

Pulo Bengkalis.—See map above.

This island is 39 geographical miles long and contains about 400 square miles. The whole surface is low and flat, and swampy during the rains. Along the coast are many clearings and sago kebuns, but most of the surface is covered with heavy forest. It is separated from the mainland by the Salat Panjang, about 3 miles wide [and 5 to 15 fathoms deep].—W. L. Abbott.

Pulo Padang.—See map, page 623.

This island is separated from the mainland of Sumatra by a continuation of the Salat Panjang. It is separated from Pulo Bengkalis by the Salat Padang, about 1 mile in width and 5 or 6 fathoms deep. At its lower end it is separated from Pulos Merbau and Tebing Tinggi by narrow channels.

It has about the same area as Pulo Bengkalis; its surface is low and flat and mostly covered with forest.—W. L. Abbott.

The mammals of these islands, Rupert, Bengkalis, and Padang, are remarkably few in number of species, considering their extent and their proximity to the coast of Sumatra. These islands are very low, only a few feet above high water, and nearly everywhere swampy after heavy rains. There are no hills anywhere and they are all doubtless of recent alluvial formation. No typhoons or heavy gales ever occur, so that the tiger and rhinoceros have never been carried across the narrow straits, as has happened in many of the islands of the Mergui Archipelago. When some of the great cyclones have occurred at the head of the Bay of Bengal, Sangar Island and much of the Sundarbans have been completely flooded, and tigers, deer, and other mammals swept out to sea in hundreds and drowned. The only heavy gales, except squalls, that occur in the Straits of Malacca are the "Sumatras," which blow for a short time with almost hurricane violence. They last only a short time, at most four or five hours, and are unaccompanied by much depression of barometer and consequent rise of sea level. The rain pours in torrents, but the short duration and comparatively local character prevent much flooding.

The large rivers which rise in the western range of mountains and flow nearly across Sumatra, to empty on this coast, the Indragiri, Siak, and Kampar, all rise enormously in the rains, particularly in the uplands. They must carry down more or less animal life on such occasions. But when the rivers reach the vast alluvial flat bordering the east coast the level of the water scarcely changes during the highest floods. There are no embankments, and the increase of fresh water simply spreads out over the forest-covered country whose surface is just a few inches above ordinary high-tide level. The fresh water merely displaces the previously salt or brackish water. The whole east coast of Sumatra is simply a huge sponge. This coast district then acts as a sort of strainer which catches any or most of the animals brought down by the floods from the highlands.

Curiously enough the bear exists in all three of the islands of Rupert, Bengkalis, and Padang. This is a common inhabitant of the swampy east coast, but is not often found in islands. It occurs in Banka, however, and in some of the Mergui Archipelago near the coast. The absence of tigers is curious, especially as its particular food pigs and *Rusa* are very common, and tigers swim very well indeed. In this connection it is to be noted that tigers were absent from Singapore Island at the time of its settlement in 1819, but became abundant ten or fifteen years later when the human population increased. At the present time they seem to swim across the Johor Strait at will. Leopards are not found in the islands. There is a wild cat common in all three islands, probably a form of *Felis bengalensis*. The natives complain much of its depredations on their poultry. Muntjacs are absent. They like dry ground and low hills and the islands are unsuited to them. They rarely occur on islands, only on Nias and on Pulo Bintang, where they have probably been introduced. Monkeys, *Macaca fascicularis* and *Presbytis cristata*, occur on all three islands. [*Presbytis percara*] on Pulo Rupert only. *Sus oi* and *Sus vittatus* both occur on Rupert, the latter very common. On Bengkalis and Padang, *Sus oi* was common

and the natives told me that the "Babi bakau," *Sus vittatus*, was very rare. It is common everywhere on the mainland.

On the small island of Pulo Payong, in the middle of Salat Rupert, the small pig, *Sus vittatus*, was very abundant, but *Sus oi* does not occur. The tracks of tiger are said to occur occasionally on Payong, but the natives said they were not real tigers, but "Rimau kwaka" (were tigers).

Manis occurs on Bengkalis. No squirrel is found on Bengkalis, but *Sciurus vittatus* is plentiful across the narrow salat in Pulo Padang. No *Ratufa* occurs on any of the islands.

The conclusion derived from the distribution of the mammalian fauna of these islands and of the Rhio-Linga Archipelago is that the present period is one of extension of land areas, either from elevation of land areas or more probably from alluvial deposit. The islands with hills have a much larger fauna. At some past period the islands in all this region extended to the mainland and received their fauna. Then followed a period of depression, when everything was sunk below sea level, except the tops of the hills. These islands were small, too much so, for the larger mammals to continue to exist. The squirrels, *Manis*, *Tragulus*, etc., remained on the small islands in safety. Then followed the present condition of things, elevation and alluvial deposition, enlarging the islands and extending the coast of Sumatra eastward and receiving additions to its fauna by swimming and introduction by man. According to this theory, the islands of Rupert, Bengkalis, Padang [Merbau, Tebing Tinggi, Reungsam, and Penjalei] are of entirely recent formation and the present fauna has entered only comparatively recently.—W. L. Abbott.

Doctor Abbott's views as to the formation of these islands and the manner in which they received their fauna are entirely in accord with my own as based on study of his collections and of the elevations of the land and depths of the sea. His explanation of the manner in which animals may be carried from the highlands of Sumatra to the lowlands of the east coast may possibly explain some puzzling points noted beyond under *Tragulus* (page 630), *Mus* (page 645), and *Ratufa* (page 636).

Pulo Tebing Tinggi.—Also called Pulo Rantow.

Pulo Merbau.—A small island.

Pulo Rangsam (or Rangsang).—Also called Medang, but not to be confused with Pulo Medang off Pulo Rupert.

The location and relative sizes of these islands may be seen on the map, page 623. They are all low alluvial islands, similar in general characteristics to the islands of Rupert, Bengkalis, and Padang, described above.

Pulo Penjalei (also called Mendol).—This is a small alluvial island at the mouth of the Kampar River.

Kateman River.—See map, page 623.

The Kateman has a course of 25 or 30 miles through the low alluvial land of eastern Sumatra. The whole country is more or less swampy. No place is more than 2 feet above high water. There are many sago plantations along its banks. During the past five or ten years [this was written in the summer of 1903] much timber near the river banks has been cut by the Chinese for the Singapore market, but the lumbering operations never extend more than a

mile from the river banks. The timber tongkans (junks) ascend the Kateman for about 18 or 20 miles. Besides the animals obtained, I saw pigs and a black leopard. Tigers also exist, but no elephants or rhinoceroses.—W. L. Abbott.

SYSTEMATIC LIST OF SPECIES.

SUS VITTATUS Müller and Schlegel.

- 1839-1844. *Sus vittatus* MÜLLER and SCHLEGEL, Verhandl. Naturg.,
Geschied. Nederl. Bezitt. Zool., p. 172, pls XXX, XXXII.
1889. *Sus vittatus*, JENTINK, Notes Leyden Museum, XI, p. 25.
1905. *Sus vittatus*, SCHNEIDER, Zool. Jahrb. Syst., XXIII, p. 127.
1906. *Sus vittatus*, MILLER, Proc. U. S. Nat. Mus., XXX, p. 746, June 13,
1906.

Three specimens from Aru Bay, one from Pulo Rupert, two from Pulo Payong in Salat Rupert, two from the Siak region, and two from Pulo Penjalei, at the mouth of the Kampar River. Those from Pulos Payong and Penjalei are very small, but it is doubtful if this is more than individual variation.

For measurements of the adults, see table, page 627.

SUS OI Miller.

1902. *Sus oi* MILLER, Proc. Biol. Soc. Washington, XV, p. 51, March 5, 1902.
1905. *Sus barbatus*, SCHNEIDER, Zool. Jahrb. Syst., XXIII, p. 128.
1906. *Sus oi*, MILLER, Proc. U. S. Nat. Mus., XXX, p. 741, June 13, 1906.

During his latest trip into eastern Sumatra, Doctor Abbott secured eight additional specimens of this large pig from the mainland or the adjoining islands. These specimens, together with material recently collected by him in western Borneo,^a indicate that the members of the *Sus barbatus* group of pigs are somewhat more variable than was at first supposed. The characters pointed out by Mr. Miller, however, appear as a rule to hold good. The most reliable character for distinguishing between *Sus oi* and *Sus barbatus* is the size and shape of the last lower molars. This tooth averages longer in the Bornean pigs and in the majority of the specimens shows three distinct cross ridges and a terminal heel, while in the Sumatran *Sus oi* most specimens have this tooth shorter, with only two cross ridges and a terminal heel, or sometimes what appears like three cross ridges and no heel. As for actual size of the skulls, the largest in the U. S. National Museum comes from Borneo (Cat. No. 142351, upper length 487 mm.). It does not, however, reach the extreme length (505 mm.) given by Mr. Miller^b for *Sus oi*. All the pigs of this group recently taken by Doctor Abbott on Sumatra or the adjacent islands are distinctly smaller than is the type of *Sus oi*.

For measurements see table, page 627.

^a Lyon, Proc. U. S. Nat. Mus., XXXIII, p. 551, December 24, 1907. Part of the specimens only.

^b Proc. U. S. Nat. Mus., XXX, 1906, p. 741.