

122. *Artamus fuscus* Vieillot. The Ashy Swallow-Shrike.

LENGTH: - 7 inches.

FIELD CHARACTERS: Sexes alike. Upper parts ashy-grey shading to vinous brown on the back; tail-coverts white; tail slaty-black tipped with white; under parts vinous-brown, paler on the abdomen; under tail-coverts white. Iris blood red. blood red.

DISTRIBUTION: Of very rare occurrence in these Hills. The honour of its discovery in these Hills belongs to my friend S. Basil Edwardes who found a small party of this bird near Solan. The one specimen he collected came into my own collection and is now in the B.N.H. Society's collection.

GENERAL HABITS: Gregarious and insectivorous, catching all their food on the wing. The flight is buoyant and graceful.

NIDIFICATION: April, May and June are said to be the principal months in which their nests may be found. This is rather a flimsy structure mainly composed of roots and fibre. It is placed in any suitable recess of a tree stump, or at the base of a palm leaf from which the leaves have fallen. Eggs number 2 to 4, the ground colour of which is cream. They are blotched with reddish-brown to deep purple brown.

(To be continued)

A NOTE ON THE POSITION OF RHINOCEROS IN BURMA

BY

W. F. H. ANSELL

(With a map and a plate)

INTRODUCTION

Before the War in Burma several articles were written on rhinoceros in Burma, and the measures for safeguarding its continuation of existence in that country.

The present writer can claim no special knowledge of rhinoceros, but immediately after the cessation of hostilities in Burma was in the position of having to make fairly extensive tours on army duties in many parts of the country. During this time I was able to pick up certain information regarding the present position of the species and thought it might be worth while to record this. Having commenced to make some notes I felt that they would be of little interest to anybody without some background and decided to try and make a summary of records of rhinoceros in recent years so that the present position could be compared with that of pre-war.

My notes are recent (1947) and though I have not been able to visit certain areas I intended to, it is this claim to being post-war and up-to-date that is my excuse for writing them.

Once again raising the question of the protection of rhinoceros in Burma surely needs no justification.

I would like to express gratitude to those members of the Forest Department who have helped my compilation of records by lending me the Game Reports of Burma and in other ways, and

to the Bombay Natural History Society who have helped me in every way, and especially by giving me access to their extensive library during my stay in Bombay.

ROUGH OUTLINE OF THE FAMILY RHINOCEROTIDAE WITH ESPECIAL REFERENCE TO BURMESE FORMS.

The family *Rhinocerotidae* of the order *Perissodactyla* (odd-toed ungulate mammals) formerly possessed a wide range, with several genera in North America, Europe, Asia and Africa, including the U.K. One of the better known of the extinct forms was the so-called Woolly Rhinoceros (*Coelodonta antiquitatis*) which existed in North Europe and Siberia. Present day forms are confined to South East Asia (including Assam, Bengal and Nepal) and Ethiopian Africa.

The African rhinoceroses, which do not concern the present subject are *Diceros bicornis* (Linnaeus) and *Ceratotherium simum* (Burchell), both being two-horned.

The Asiatic forms are as follows:—

Genus *Rhinoceros*, Linnaeus, Syst. Nat. ed. 10, vol. i, p. 56, 1758.

One horned; skin divided into heavy folds; few hairs except on ears and tail.

1. *Rhinoceros unicornis* Linnaeus op. cit.

The Great Indian One-horned Rhinoceros. Vernacular: Gaiinda (Hind.).

Skin tuberculated, or 'studded'. Folds of skin heavier; folds running over shoulders not meeting on neck; size larger. Confined to Assam, Bengal and Nepal and does not concern the present area.

2. *Rhinoceros sondaicus* Desmarest, Mammalogie, vol. ii, p. 399, 1822.

The Javan, or Lesser One-horned Rhinoceros. Vernacular: Gaiinda (Hind.), Kyan or Kyanesin (Burmese), Badak (Malay), Ta-do or Ta-do-khaw (Karen).

Skin not tubercular. Throat folds less heavy; shoulder folds joining on neck to form anterior nape fold; size smaller. Horn in females small or absent.

RANGE: (i.e. former range) Assam (?) the Sunderbans and certain other parts of Bengal; the Sikkim Terai, Burma, Malaya, Sumatra (?) Java, Borneo, Siam. Indo-China? 'Western Provinces of China' Sterndale, p. 410 (from MS by Cockburn).

'Kinloch shot an undoubted specimen in the Sikkim Terai'—Blanford. Mr. G. Busk ascribed a tooth from Sarawak (Borneo) to *R. sondaicus* and considered that two teeth obtained by Mr. Wallace in Sumatra were of the same species (*P.Z.S.* 1869, p. 409).

'The Sunderbans and formerly the Rajmahal hills in Bengal; Assam, south of the Brahmaputra . . .' (Cat. Mamm. Ind. Mus. Calcutta, Pt. II, p. 203, 1891.)

The Cat. of Ind. Museum includes a list of specimens from Sunderbunds, Jessore Dist. (Bengal), Tennasserim, Tavoy Point and Java.

Jerdon (*Mammals of India* 1874, p. 234) recorded a few *R. sondaicus* in the forest along the Mahanaddy River and the Rajmahal Hills near the Ganges and 'more abundantly in Burma and . . . Borneo.' He records that several had been shot 'recently' within a few miles of Calcutta.

C. H. Stockley in *Big Game Shooting in the Indian Empire* 1928, records the Sikkim Terai among other places.

HABITAT: *R. sondaicus* frequents forests, and Blanford records that it has been observed at considerable elevations. But in the Sunderbans it frequents swampy ground and E. H. Peacock records a fondness for low lying swampy ground.

Sterndale (1884) records one at an altitude of 4,000 feet and describes it as 'more of a forester' than *R. unicornis*.

It would seem from the above that the species can make itself at home either in low lying swamp or hill forest (though not as dense or as hilly forests as *D. sumatrensis*).

DIMENSIONS: Cockburn recorded of a female as follows. Length of body (head and body?) 12 ft. 3 ins.; tail 2 ft. 4½ ins.; height 5 ft. 6 ins. 'The height of a mature specimen is probably about 5 ft. 6 ins.' (Peacock).

HORN: 'Said to be about 10 ins. in length' (Peacock).

Length on front curve of horn 10½ ins. has been recorded from Java.

SENSES, HABITS AND FOOD: Similar to *D. sumatrensis* according to E. H. Peacock, and 'presumably of a less active and alert disposition'.

BREEDING: Presumably similar to others of the family, but little or nothing has been recorded about its breeding habits.

Genus *Dicerorhinus* Gloger, Handbuch Naturgesch, p. 125, 1841.

Two horned; skin folded; more or less hairy all over. Ears well fringed with hair. The body hairs take the form of bristles.

1. *Dicerorhinus sumatrensis* (Cuvier) Regne Animal., vol. i, p. 240, 1817 (as *R. sumatrensis*).

The Sumatran or Hairy Rhinoceros. Vernacular: Kyan or Wet Kyan, (Burmese) Ta-do or Ta-do-khaw (Karen) Lawon (Shan) Badak (Malay).

Characters as under the genus. The smallest living representative of the family.

Type locality: Sumatra.

Local races of the species in Burma have been named as follows:—

Dicerorhinus sumatrensis blythi (Gray). Type locality: Tenasserim.

Dicerorhinus sumatrensis lasiotis (Sclater). Type locality: Chittagong.

RANGE: Assam, Tipperah, Arakan, Burma, Siam, Fr. Indo-China, Malaya, Sumatra, Borneo (not Java). Extinct or very rare in most parts.

'Rare in Assam' (Blanford).

A specimen shot in Brahmaputra valley is recorded in *P.Z.S.* 1875, p. 566.

I can find no mention of the species in the Sunderbans of Bengal.
HABITAT: Mainly if not exclusively dense hill forests.

The species wherever it is found needs mud wallows, and these are often in the pockets of hills near the sources of streams, according to Peacock.

'Seems to stick to hills' (Stockley).

DIMENSIONS: The smallest form of living rhinoceros. 'The type of *lasiotis* was 4 ft. 4 ins. high and 8 ft. long from snout to root of tail; its weight about 2,000 lbs. (Anderson).'

'An old female from Malacca was only 3 ft. 8 ins. high' (Blanford) . . . 'Average height is about 4 ft. 3 ins. and average length about 10 ft. including the tail. This was the average of three' . . . (Peacock). Peacock's largest specimen was 4 ft. 8 ins. in height.

HORN MEASUREMENTS: There is a specimen with front horn 32 $\frac{1}{8}$ ins. in the British Museum.

Peacock gives 7-8 ins. average for front horn of ♂♂ and 3 ins. for posterior horn; and 3 ins. for anterior horn of ♀♀ and 'mere knobs' for the posterior horns, in Burmese rhinoceroses.

SENSES: Smell and hearing are said to be very good, but as throughout the family the sight is poor.

HABITS AND FOOD: *D. sumatrensis* is a prehensile-lipped browser, feeding off leaves, twigs and other suitable plants including small bamboo.

It is a shy and retiring animal and addicted to wandering, often for great distances, from its normal beat. As remarked above it has a particular liking for mud wallows (which seem essential for its well-being) and which will invariably be found where the species exists. The day is spent lying up or in a wallow, feeding usually taking place in the early morning and evening.

Like others of the family it uses the same place when possible for excretion, the pile of dung often becoming considerably large, according to some authorities.

BREEDING: One calf at a time is usual, but little is on record about its breeding habits.

'The period of gestation is said to be eight months' (Peacock).

Bartlett considered the period of gestation to be probably a little over 7 months (*P.Z.S.* 1873, p. 104).

2. POSITION OF RHINOCEROS IN BURMA IN THE PAST, AND A FEW LEGENDS REGARDING RHINOCEROS.

The rhinoceros, being so large and striking a creature, it would be surprising if several legends concerning it did not arise, and unfortunately some of the legends about it have proved the undoing of the Asiatic species to an alarming extent.

A widespread belief throughout the East in the aphrodisiac properties of rhinoceros horn, especially among the Chinese has been the primary cause of the great diminution in numbers of all the species in Asia, and the rarity of rhinoceros resulting from this

makes the horn all the more valuable. Thus, the demand being ever unsatisfied, the value would, and in fact, does, rise in something like direct proportion to the decrease in the numbers of rhinoceros.

It is said that in the old days caravans used to come from China, right across Tibet to India in search of the horn, resulting in the extermination of *R. unicornis* throughout a large part of its range, till today it survives only in parts of Nepal, Bengal and Assam.

The Hindus are said among others to cherish a belief in the potency of rhinoceros horn as an aphrodisiac.

The Burmese rhinoceroses too suffered from this quest for horn, and within recent years it has resulted in, for all practical purposes, the extinction in Burma of *Rhinoceros sondaicus*, and reduction to a danger point of *Dicerorhinus sumatrensis*.

It was, of course, the advent of the firearm which produced this alarming decrease in numbers, as before the days of guns and rifles the rhinoceros had apparently weathered the storm of centuries of pursuit reasonably well.

Relying on pitfalls and other primitive means, the securing of a rhinoceros, even where plentiful would doubtless be a feat requiring unlimited patience and skill, and some courage, for the rhinoceros of all species are well known as no mean adversaries when aroused.

However, with firearms in the hands of an experienced hunter the killing of a rhinoceros would present no great difficulty granting that sufficient time were available to locate it.

E. H. Peacock states that before the advent of firearms the Sumatran rhinoceros must have been fairly common in Burma, and that also there must have been a fair number of *sondaicus* in the parts of lower Burma frequented by the species. Certainly there is no lack of suitable country for both forms in Burma, with its vast forests and hills (though encroachment of cultivation in some of the lower lying haunts of *R. sondaicus* would probably tend to localize the species to some extent).

It may be said that, generally speaking, one of the more usual (and often decisive) factors in the extermination, or extreme reduction and localization of any species was absent or nearly so in the case of the rhinoceros in Burma. I refer, of course, to the advancement of civilisation, usually in the form of cultivation into the habitat of species. It is difficult to conceive of any serious conflict of interests in the claims of the rhinoceros and cultivators in Burma; and the rhinoceros on the whole is considered a fairly harmless beast. More especially is this apparent in the fact that such a large proportion of Burma's wealth lies in timber, and consequently the upkeep and maintenance of the forests is an important factor in the country's economy.

The Karens of Burma, and probably other races too, believe in the efficacy of rhinoceros blood and other parts in curing many ailments which gives added incentive to the poacher. In fact there is no part of the rhinoceros (including the urine) which would not be saleable at a high price.

To illustrate the extremely active demand for rhinoceros parts I can quote the fact that during the British retreat from Burma in 1942, the rhinoceros in the Rangoon Zoological Gardens was killed and stolen; I believe almost before the City was evacuated completely. A mounted head which came into my possession in 1946 had been on the wall of a large stores in Rangoon for many years, but during the Japanese occupation the anterior horn was completely removed.

There is a legend in Burma which I have heard quoted in widely separated parts of the country that one of the reasons for the slow rate of increase in rhinoceros is due to the female tossing logs off the track over her back, killing the young. Alternatively this story is rendered as the calf itself being thus thrown into the air. What foundation, if any, exists for this legend I am unable to say.

Several authors in their writings about rhinoceros have quoted the belief in a 'fire-eating' or 'fire attacking' rhinoceros. I have met no reference to this in Burma from locals whom I have come across.

This year I came across a Karen belief that I had never previously heard. It is that it is considered a bad omen to kill a rhinoceros, as doing so will result either in the death of some member of one's family or in crop failure, or similar retribution.

However, I am sure that no such consideration would put the Karens off killing a rhinoceros if the opportunity offered, and indeed if the truth be known I should imagine that Karen hunters had taken a large part in the sad reduction of rhinoceros in Burma especially *R. sondaicus*.

Summing up, it may be said that on the whole rhinoceros in Burma before the coming of the firearm were in a reasonably good position in so far as a very extensive habitat for them existed all over the country, and that indiscriminate poaching with firearms has been in the main responsible for their great reduction.

3. LEGISLATION REGARDING RHINOCEROS IN BURMA.

At the outset of this paragraph I will say that legislation for the Protection of Wild Life in Burma today may be considered as almost a complete farce, and existing for all practical purposes only on paper with no machinery for enforcing the laws.

Regarding rhinoceros there are appalling loopholes in the law itself.

First the penalties for destruction of rhinoceros have too low a maximum, and the probability is that even in the unlikely event of a conviction for an offence regarding rhinoceros the full penalty, such as it is, would not be imposed.

Minimum penalties should include at least a term of imprisonment without option of a fine, plus such a fine as would be appropriate.

I am convinced that to kill a rhinoceros in Burma today would repay one's efforts handsomely even should the maximum penalty be incurred.

The next defect in the law is even worse, as it makes it legal for persons other than museums or similar accredited institutions to possess parts of rhinoceros for 'medicinal' purposes. How this came about is shown below, being the gist of Chapter V of the Burma Game Warden's Report for 1934.

In 1933 the then Prince of Wales instituted an enquiry into the adequacy of protection for rhinoceros in the Indian Empire (which at that time included Burma). The result of this was that a Select Committee was appointed to look into the matter, and the penalty for killing a rhinoceros illicitly was increased. This was all to the good, but a farther amendment was made

The Wild Birds and Animals Protection Act previously restricted the legal killing of rhinoceros to persons in possession of a Special Governor's Licence which would be issued only in the interests of scientific research, and as it stood was quite reasonable and adequate.

But the Select Committee, in spite of earnest pleas by the then Game Warden, decided to pander to fictitious beliefs and superstitions and considered it desirable to provide for cases where the killing of rhinoceros for 'medicinal' purposes might be justified.

The Committee considered the words 'in the interests of scientific research' were 'too binding' (as if they were not meant to be 'binding') and accordingly this clause was deleted from the provisions governing the issue of licences under Rule 18 of the Act.

And this in spite of the Game Warden pointing out that *R. sondaicus* was the rarest large mammal in the world!

It is difficult to conceive how any responsible body could have taken such a retrogressive and unenlightened step. One assumes that the Committee was composed of educated persons and as such one would have expected belief in superstition to have been supplanted by some faith in modern medicine.

Even assuming that the Committee as a whole held belief in the medicinal properties of rhinoceros parts, one would expect them to have realised that in any case the supply of such parts available would be totally inadequate and soon become exhausted, Burma losing for ever in the process one of its grandest and most interesting species.

This was another blot on the copy book of wild life protection in Burma, which seems, (if I may continue the metaphor) more blots than clean sheet.

In fairness, however, I must say that up to and including the last published Game Report there was no record of a Special Licence for rhinoceros having been issued for 'medicinal' purposes and there is no reason to suppose that any such licence has been issued since up to date (July '47).

This, however, gives little cause for complacency as (except during the Japanese occupation) the Governor under whose hand such licence would have to be given, and the senior forest officers through whom any request for such would have to go, have up to now been Europeans, while now the administration is becoming more and more Burmese, and in the very near future likely

to be completely so. In this connection it should be remembered that it was undoubtedly the Oriental section of the Select Committee who were responsible for the amendment referred to above.

Regarding rhinoceros sanctuaries, or sanctuaries constituted mainly for the protection of rhinoceros, there are three nominal ones in Burma at present. These are dealt with in the following paragraph.

In *J.B.N.H.S.* Vol. xxxix, No. 3, p. 606 (1938) is a note on the Burma Wild Life Protection Act. It gives a good account of the revision of the Act of 1936 under which it became legal for any physician, druggist or private person to possess rhinoceros blood or any preparation thereof for 'medicinal' use. This seems to be a further amendment to the deletion of the clause 'in the interests of scientific research', and is of course another retrograde step.

To sum up, it would seem that the following conditions apply to rhinoceros in Burma today (though my information may possibly not be complete).

Rhinoceros of both sexes are completely protected throughout the year and may not be hunted except under a Special Licence. But it is not illegal for any person to possess rhinoceros blood for 'medicinal' purposes.

4. RECENT AND PRESENT RANGE AND DISTRIBUTION OF RHINOCEROS IN BURMA.

[From 1929 to the present (1947)]

As referred to above the rhinoceros must have had a considerable range all over Burma until its great reduction in numbers, and even today the range of *D. sumatrensis* is very extensive, though everywhere the animal is rare and has become extremely localised.

In this paragraph will be given at the start a brief outline of the sanctuaries constituted mainly for the protection of rhinoceros, as these are so often referred to in the information derived from the Game Reports. Subsequently other known and probable locations of rhinoceros will be mentioned with any relative evidence I have been able to collect.

(a) The Shwe-U-Daung Sanctuary lies in East Katha and Mongmit State and is 81 square miles in extent. It is in high mountainous country with plenty of dense cover favoured by *Dicerorhinus sumatrensis*, the form inhabiting the Sanctuary. Rhinoceros are found mostly on the Mongmit side of the border.

The species has probably always existed in the area, but it is exceedingly difficult to give any accurate estimate of numbers. What is certain is that there are at least five regularly used wallows. Young have occasionally been reported in the Sanctuary.

It is quite possible to visit the Sanctuary and see three or even more specimens, and equally possible to see none at all, though invariably signs of them will be found. A legend that the mountain

spirits of Shwe-U-Daung do not like poaching is probably one of the most effective factors in the success of this Sanctuary to date.

The rhinoceros occasionally wander outside the Sanctuary limits.

(b) The Kahilu Sanctuary in the Salween and Thaton districts was originally constituted for the protection of *Rhinoceros sondaicus* but investigations in 1938/39 cast doubt upon their existence (vide para 5 below). A specimen in 1939/40 was identified as *D. sumatrensis*. The Sanctuary is 62 square miles in extent. Previously two Rangers were employed to look after this sanctuary.

(c) The Mulayit Sanctuary in the Mergui Division was originally thought to contain rhinoceros but, as far as I can trace, their presence there was never either proved or disproved. The probability is that specimens may wander there from time to time.

(d) The Pidaung Sanctuary, near Myitkyina, 260 square miles in extent is not specially a rhinoceros preserve, but Mr. Mustill formerly Game Warden, Burma, noted on one of my maps that rhinoceros migrate there at times from the Uyu river drainage.

Following is some information derived from the Game Warden's Reports of Burma when they were published annually from 1929 to 1940, and the extracts refer to the year previous to publication.

1929-30. The Game Warden saw a rhinoceros in the Shwe-U-Daung Sanctuary at 5,000 ft., but it was reported they are not plentiful there. The Kahilu was reported to contain at least three rhinoceros. Tracks of an adult were seen. The keepers saw two, and tracks of two other, of which one set was believed to have been of the calf born in 1928.

Tracks of a rhinoceros believed to be *R. sondaicus* were seen on the Dawna Range at 6,822 feet. It was reported that there were at least two gangs of rhinoceros and elephant poachers in the Arakan Yomas.

1931. In the Shwe-U-Daung a ♂ *D. sumatrensis* was shot under orders by the Game Warden, on the Mongmit side. The skin and skull were sent to the British Museum.

Three rhinoceros were seen and it is estimated that there are eight to ten altogether there. The legend of the *Nats* (spirits) on Shwe-U-Daung is mentioned as a probable cause of the immunity of rhinoceros from poachers in the Sanctuary.

In the Kahilu Sanctuary a skeleton, believed to be that of *R. sondaicus*, was found. It is estimated that there are four specimens in the area.

During the year a rhinoceros crossed the Uyu drainage and came within 5 miles of the railway line in Katha division. Unfortunately a Kachin shot it.

1932. Four specimens were estimated in the Kahilu Sanctuary. The young one born in 1928 was reported to be 2½ ft. in height.

Another rhinoceros came over the Uyu area into the Nami and Ledan valleys during the cold weather and was seen as far south as the Indaw-Banmauk road. Later it was reported making for the Meza Chaung.

1933. In the Shwe-U-Daung tracks were seen, but no evidence of any increase reported. The number is estimated at not more than twelve, the majority being in the dense jungle on the Mongmit side, and in the Ye-nya-u drainage.

Mr. Allsop reported that at least six specimens were in the Kahilu.

The coast in Mergui district is mentioned as a former haunt of rhinoceros.

Illicit hunting of rhinoceros was reported on the Arakan Yomas and two accused fined Rs. 50 each for being in possession of rhino blood and four hooves.

(Note the ridiculous inadequacy of the punishment!)

1934. Fresh tracks were seen in the Shwe-U-Daung.

The Kahilu estimate was still six specimens.

They were reported to be fond of eating chillie crops and doing a little damage in the *taungyas* (fields, usually among the hills, cut out of the jungle, and usually abandoned after one season). In July (1933) a forester reported he had seen two rhinoceros mating.

1935. One specimen was seen in the Shwe-U-Daung but no tracks were seen on the Burma side. The rhinoceros in Kahilu were estimated by the head keeper at the figure of eight, but this was not verified.

Two rhinoceros were rumoured in the Nam Pawn drainage in Karenni.

1936. It was reported again that the Shwe-U-Daung rhinoceros prefer the dense jungle on the Shan States (Mongmit) side of the Sanctuary, and that there were several wallows there. The estimate of numbers was eight.

The keeper's report of eight rhinoceros in Kahilu was not confirmed and the official estimate remained at six. They were reported to leave the Sanctuary at times and feed outside during the dry season.

A rhinoceros was seen on the left bank of the Uyu river in West Katha division, and two were reported from the East bank of the Chindwin river, above Homalin. It was suggested by reports that there were several rhinoceros in West Katha, in the Namaw R. F. and the Uyu drainage.

In Henzada division a rhinoceros was seen in the Chaukni stream, west of Kyangin.

In Myitkyina area a rhinoceros was shot in the Nanyin Kha reserve. Two accused were given two months R.I. plus Rs. 100 fine, or a further month's R.I. in default of payment.

(Note.—It is gratifying to see that prompt action was taken in this case, and that a prison sentence was awarded.)

1937. Doubt was expressed as to the presence in Shwe-U-Daung of more than ten specimens.

There were five wallows on the Mongmit side, but no young ones were reported. In Kahilu the six specimens were accounted for.

Rhinoceros were reported in the Mulayit Sanctuary in the Mergui area.

A note on the Shwe-U-Daung puts the estimate as given by the locals at between 10 and 200! Obviously the first figure would be much nearer the mark, and even optimistic.

1938. In Shwe-U-Daung the five wallows were seen and the estimate of numbers was given as about five and probably more, but no calves. Tracks found on hard ground measured 7 inches in diameter.

In Kahilu a calf was said to have been born in the year ending March 1938. The total number in the Sanctuary was given as seven, consisting of two bulls, four cows and one bull calf.

The Kahilu rhinoceros were reported to occasionally leave the Sanctuary and visit salt licks outside.

Suggestions for the improvement of the Shwe-U-Daung Sanctuary were given.

A rhinoceros was reported in the lower Uyu valley in 1937.

There were reported rumours of a so-called 'Pygmy rhinoceros' in the Salween area. (See para 7 below.)

(Note on the breeding of rhinoceros in Kahilu. If the report of two rhinoceros mating in 1933 were correct it is possible that another calf may have been born between then and 1938. The last previous record of a birth in the area was in 1928.)

1939. The Shwe-U-Daung estimate is given as between twelve and fifteen. Tracks were seen believed to have been of a cow and a calf, and many other tracks found. On the Mongmit side tracks of at least three were seen. Tracks of one were observed on the Burma side, outside the Sanctuary. Three rhinoceros were reported as living in the areas of the wallows. From the tracks and dung seen it was stated that there was no indication of any decrease in the rhinoceros in the Sanctuary.

Doubt was expressed as to whether the rhinoceros in Kahilu were *D. sumatrensis* or *R. sondaicus* (see para 5 below.)

Tracks of a rhinoceros were found in Thanichaung Reserve in Thayetmyo division.

1940. In the Shwe-U-Daung no casualties were reported, and a young one was seen. It was considered that the herd in this area was well established. An estimate of fifteen specimens was given, including seven young (but it was mentioned that this must be taken with reserve).

In Kahilu one specimen was definitely identified as *D. sumatrensis* and it was stated that it was considered that *Rhinoceros sondaicus* did not exist in that area any longer. However, it is mentioned that a rhinoceros with a calf was seen by Karens in the year 1939-40 at the foot of the Kyaikto hill, on the border of Thaton and Pegu districts. The Karens' description is said to have closely corresponded with that of *R. sondaicus*, and steps were taken to follow this up, with what result is not mentioned.

There is a note in the 1940 report that tracks of *R. sondaicus* may measure up to 11 inches in diameter while those of *D. sumatrensis* rarely exceed 8 inches.

In the Amherst district tracks of rhinoceros were reported in the Man-aung and Yechaung Reserves, and tracks of another in

the Tavoy Division. Tracks were also reported in the Henzada-Bassain Division (exact place not stated). Another track was seen on Sanwingan Hill in Tharrawaddy.

The range of *Dicerorhinus sumatrensis* is stated to include Tenasserim, Pegu Yomas, Arakan Yomas, Lower Salween and the Uyu drainage.

Such are the various records of rhinoceros in Burma from the official Game Warden's Reports up to their cessation in 1940.

Mr. C. McCann of the B.N.H.S. informs me that he observed the tracks of a rhinoceros in 1935 in the area between Tawmaw and Kora, north of the Uyu river, and Peacock mentions parts of Myitkyina area as locations (or former locations) of *Dicerorhinus sumatrensis*.

Little is on record during the War years except the following:—

In the *Journal B.N.H.S.* for December 1945 there is a letter from Lieut.-Gen. Sir Philip Christison on the present distribution of *Dicerorhinus sumatrensis* in the Arakan, with a map. This note recorded the distribution in five different areas, based on actual specimens seen, and tracks, droppings and wallows pointed out by the locals.

The areas marked by Gen. Christison on his map are:

- (a) About 15 miles N.E. of Paletwa;
- (b) About 25 miles east of Paletwa and c. 40 miles N.N.E. of Myobaung;
- (c) About 22 miles N.E. of Myobaung.
(A specimen was seen in each of the above areas.)
- (d) About 50 miles S.S.E. of Myobaung and c. 40 miles N.E. of Myebon;
- (e) In a line with Sandoway and Prome and about half way between.

The three specimens actually observed were recorded by three different officers and all said the rhinoceros they saw had one horn, but Gen. Christison did not accept this as indicating *R. sondaicus* because of the ease of mistaking a specimen with only a small posterior horn as one horned, and because the places where the rhinoceros were seen was so typical of the haunts of the Sumatran form.

General Christison states that on two occasions tracks of a cow with calf were observed, and his note is exceedingly interesting, especially as it is so recent and so carefully recorded. Fortunately I am able to supplement Christison's information to a small extent regarding rhinoceros in the Arakan Yomas.

In August 1946 when at Prome I met a Forest Ranger of Thayetmo who stated that there are mud wallows used by rhinoceros in the Thaledan R. F. which is between Sandoway and Prome in one of the areas indicated on Gen. Christison's map. This ranger also said that the forests of Mindon are reputed to contain a few rhinoceros, and in his own opinion there were not more than four or five on the whole eastern side of the Range, and they are not resident but migratory. In 1940 this ranger got a report

of blood and bones of a rhinoceros in the possession of someone in the Arakan Yomas.

Southwards rhinoceros used to be found right along the Yomas for some distance almost to the southern coast but whether there are any now I am unable to say.

Mr. Castens states that when he was in Arakan some years ago there were a fair number of 2-horned rhinoceros about. In other parts of Burma I have been able to collect the following recent indications of rhinoceros.

A semi-official statement obtained by me at Myitkyina indicates that a rhinoceros was killed in early 1946 in the Bhamo district in so-called 'defence of crops'. Unfortunately, with the state of the country at that time little was done to follow up the matter, though apparently the excuse for destroying the rhinoceros was accepted.

Regarding the Shwe-U-Daung rhinoceros, there is no evidence that they suffered during the Japanese occupation. One of the Mongmit State officials informed me that there were about eight rhinoceros there, and the fact that there are undoubtedly rhinoceros in the sanctuary seems to be well known in the State. Mr. Lindsay-Smith, D.F.O., East Katha, says that the number is reported to be fifteen, so it seems that the general estimate is about the same as before the war.

The Kachins near Hopin told me of the supposed existence of rhinoceros west of Indawgyi Lake; and this would seem to indicate the Namaw Reserve area.

An official of Bawlake State (Karenni) informed me that there were about six rhinoceros in the Salween area. He said 'south of Mawchi' and might have meant the Yunzalin watershed, but more probably he meant the Kahilu area itself.

A D.O. letter from the D.F.O. Thaton (Aug. 1946), in answer to an enquiry, informs me that there is at least 'one family' of rhinoceros in the Kahilu Sanctuary and that tracks of two were recently seen.

Mr. F. Allsop, P.F.O. Shan States informs me (in litt.) that no rhinoceros are known to exist in the Southern Shan States or Karenni, and that he has never heard of them in these areas, in which he has travelled extensively. However, in addition to the rhinoceros reported in the Nam Pawn drainage in 1935 (see above) I have received information, (that I consider fairly reliable), of a ♀ rhinoceros killed somewhere about 1935 near M.S. 70 Mawchi Road, South of Kwachi village.

I had hoped that I might have obtained some records of rhinoceros in and north of Kantharawaddy State towards the Salween, and the Indo-China and Siam border but failed to do so. This area would seem to me to be eminently suitable for rhinoceros and I was disappointed not to come across any records. In the face of this information I think it can be assumed without much fear of contradiction that no rhinoceros now exists in Karenni.

Regarding Pegu Yomas, there are still a few rhinoceros in the dense jungles round about the central portions of the range. Last

year (1946), about March I received information that the tracks of a cow and calf had been seen in the Yomas, exact locality not stated but probably North-West of Pegu. If this is correct, the existence of a calf implies a third specimen—the bull; and I consider this information reliable, it being supplied by a European representative of one of the timber firms from his personal observation.

Further evidence of rhinoceros was obtained by me this year. Having an interest in the elephant catching operations in the South Pegu area in the 1946-47 season I instructed the Karens working on the stockade to report any signs of rhinoceros, and in March a track of a rhinoceros was seen in the Shwelaung reserve between Shwelaung and the Pegu river, about four miles from Kadokchaung. The observer called one of the workmen to look at them and he confirmed that the track was of a rhinoceros. I consider this evidence reliable. The track was said to be fairly large, about the size of that of a 5-foot elephant, which would be about 2' 6" circumference.

Before giving a summary of the present known, and possible locations of rhinoceros in Burma, I must draw attention to certain articles that appeared in the *J.B.N.H.S.* regarding the position of both species in Burma prior to the War.

These articles are a memorandum on the Kahilu Sanctuary by Mr. D'Arcy Weatherbe, written after a visit to the Sanctuary, (*J.B.N.H.S.*, Vol. XLI, No. 1, p. 146). This note, by an acknowledged authority, goes very thoroughly into the status of the Sanctuary, and into the question of the species of rhinoceros in the area, and casts doubt on the many references regarding the number and species of rhinoceros that were acquired from the Game Rangers.

A good review by the late Theodore Hubback of the Annual Report on Game Preservation in Burma for the year ended March 1938 is contained in the same issue of the *Journal*. Another article entitled 'Burma's decreasing Wild Life' is found in *J.B.N.H.S.*, Vol. XLII, p. 150, also by Mr. D'Arcy Weatherbe (Dec. 1940).

These articles I strongly recommend to anyone who has the future of Burma's wild life at heart. There is much hard hitting in the way of criticism of the measures taken pre-war to safeguard the Burmese fauna—all of it supported by facts, and all of it seems abundantly justified.

Much of the information I have quoted above from the Game Warden's Reports is subjected to fair criticism and analysed. (I have merely set this information down as the gist of the official record only, and advise anyone interested to read the extracts in conjunction with Mr. Weatherbe's notes.)

Following is a summary, mainly based on the information recorded above of the present known locations of rhinoceros in Burma and of the other areas where they possibly or probably exist.

(a) *The Shwe-U-Daung Sanctuary*.—There are certainly a few specimens of *Dicerorhinus sumatrensis* in the sanctuary at present and no positive evidence of any undue decrease in numbers since pre-war. The estimates I have been able to gather are from eight

to fifteen though both these figures are probably arbitrary and should not be taken as in any way accurate.

(b) *Arakan Yomas*.—A few rhinoceros exist in the Arakan ranges, from the Paletwa Area in the north to at least as far south as below the Sandoway-Prome road. The rhinoceros of this area undoubtedly spread at times to the eastern side of the range in the forests of Mindon and Thayetmyo, and probably into Henzada Division as well, in addition to the Arakan side proper. From General Christison's report I am inclined to think there are more specimens here than commonly supposed, and certainly there is more positive (recent) evidence than for any other area.

(c) *Pegu Yomas*.—It is known that a few specimens are at present in the Pegu Yomas and these would probably range in the Pegu, Tharrawaddy, and Insein Divisions, possibly Prome, and may at odd times go as far north as the southern part of Toungoo district.

(d) *The Uyu River Drainage area*.—Though I have no actual positive records of rhinoceros being seen here since the end of the war the area is very remote and (comparatively) sparsely populated and was not disturbed in any major way by the progress of the war. It is an area in which a few rhinoceros have always been supposed to exist and there is no reason to suppose they were entirely wiped out during War years. Rather to the east of the Uyu itself and west of Indawgyi Lake is the Namaw Reserved Forest and the Kachins in the 'Railway corridor' at Hopin reported that a few rhinoceros could be found occasionally in the area. Farther to the east this vast tract of wild country joins the Pidaung Reserve (unfortunately I believe severely 'shot out' during the war) and Mr. Mustill, formerly Game Warden, informed me by a diagram on one of my maps of a migration of rhinoceros at times from the Uyu area to Pidaung. From the Game Reports there have been many positive records of rhinoceros from the Uyu in recent years and it can be considered as almost certain that a few specimens exist there today.

(e) *Kahilu Sanctuary and the Yunzalin River area*.—Tracks were seen of two rhinoceros in the Kahilu last year and from the other reports I have obtained it seems that there are a few in the area today. I imagine these would be isolated from the southern part of Tenasserim, and from Siam by the Salween river. These rhinoceros would range in the Salween and Thaton areas, possibly touching on Pegu Division.

(f) *Tennasserim Peninsula*.—I have no post-war record of rhinoceros in this area but from past accounts it seems likely that there may be an odd, (and probably isolated), specimen or two anywhere in the dense jungle covered mountains of the Dawna Range and all down the peninsula in the Mergui and Tavoy Divisions, these rhinoceros undoubtedly at times crossing the Siamese border.

(g) *Bhamo area*.—The rhinoceros reported shot in the Bhamo area was possibly a wanderer from the Shwe-U-Daung in which case it would have crossed the Shweli river. It is just possible

that one or two may exist in the hill tracts in the Bhamo area, but probably their numbers would be negligible.

These I consider are the only areas where rhinoceros might be found in Burma today.

Anyone acquainted with the country can see what vast areas there are which are ideal habitat for the animal, in which they have long since disappeared, such as for instance the Chin Hills and Karenni States.

I give below, for what it is worth, an estimate of numbers of rhinoceros at present in Burma.

LOWEST REASONABLE ESTIMATE.

<i>Shwe-U-Daung</i>	5—Known established haunt of <i>D. sumatrensis</i> . Estimates over many years have been between five and fifteen.
<i>Arakan</i>	7—Three seen (1944-45), tracks of cows with calf noted twice.
<i>Pegu Yomas</i>	3—Tracks of three seen 1946-47.
<i>Kahilu area</i>	2—Tracks seen in 1946.
<i>Uyu drainage area</i>	4—An arbitrary estimate based on frequent records of specimens from this area for some years and the fact that there seems to have been no undue disturbance during the war.
Total	21

POSSIBLE REASONABLE ESTIMATE.

<i>Shwe-U-Daung</i>	10
<i>Arakan</i>	12
<i>Pegu Yomas</i>	5
<i>Kahilu and Yuzalin</i>	6
<i>Uyu drainage</i>	8
<i>Tennasserim peninsula</i>	4
Total	45

I conclude that there are not less than 21 rhinoceros in Burma today and possibly as many as 45 though the latter figure may be considered too optimistic by some.

5. THE QUESTION OF THE EXISTENCE OF *Rhinoceros sondaicus* AT PRESENT IN BURMA.

The Kahilu Sanctuary was constituted in 1928 mainly for the preservation of *R. sondaicus* which were believed to still exist there. However, the Sanctuary was visited in 1938 in March and April by Mr. D'Arcy Weatherbe during which time he observed and measured many tracks, though not actually seeing a specimen, and as a result doubt was expressed that *R. sondaicus* existed in the area at that time. A report was made of this visit by Mr. Weatherbe and a memorandum on the Sanctuary published in *J.B.N.H.S.*, Vol. XLI, No. 1, p. 146, August 1939 (already referred to in Para 4).

In this memorandum a very detailed and searching analysis of the factors regarding the form of rhinoceros in Kahilu is made, and on reading this one is compelled to believe that the odds are on the species being *Dicerorhinus sumatrensis*.

Evidence in favour of the species being *R. sondaicus* is to a large extent based on observations of local Karens and does not carry much weight. A skull found in Kahilu in 1928 and another in 1931 were identified by Bombay Natural History Society as *R. sondaicus*, but as Mr. Weatherbe points out these do not necessarily have any bearing on the species that existed so many years later. He also points out the flaws in the visual evidence and from all this the verdict it seems must remain, if not entirely disproved, at least not definitely proved.

The small size of the posterior horn in *D. sumatrensis* and the ease with which this form can be taken for a one-horned beast must also be taken into account. I may mention that in every case of rhinoceros in Burma described to me they have been said to be 'one-horned', when in most cases there would seem no doubt that the Sumatran two-horned form was being referred to.

Farther, the Yunzalin-Salween watershed area which is only a few miles from the Kahilu Sanctuary is known as a haunt of *D. sumatrensis*; and finally, in the Game Report of 1940 the Warden got a clear view (and photographic record too) of a specimen of *Dicerorhinus sumatrensis* in a wallow, and it is added that the track of this animal was the largest measured in the Sanctuary.

Regarding other areas of Burma, Peacock states that the only definite evidence of the existence of *R. sondaicus* in Burma comes from the Thaton, Salween and Mergui Forest Divisions, and gives the forests of Victoria Point sub-division as one of the best known of its former haunts (*A Game Book for Burma*, Chap. IX). The hope that was entertained some years ago that *R. sondaicus* might have been found in the Shwe-U-Daung area seems to have remained just a hope and nothing more.

By inference, considering the former wide range of *R. sondaicus* (Bengal to Borneo and south to Java) the species probably ranged all over Burma, though apparently not in living memory. If this be true, from the absence of any very recent evidence of the form north of Thaton, it may have been that it succumbed to persecution even before the advent of firearms, to a much greater extent than *Dicerorhinus sumatrensis*.

Shortridge (*J.B.N.H.S.*, Vol. XXIII, p. 772, 1914) states that both forms were about equal in numbers in Burma and Jerdon (1874) says 'More abundantly' in Burma than Bengal.

Is one to believe that in spite of so much persecution, and the apparent helplessness of *sondaicus* in the face of it, that this form has managed to keep on existing in a small and comparatively accessible area, much of it not even reserved forest (Kahilu Sanctuary is made up of only 14 sq. miles of Reserved Forest and the rest villages, cultivation, and public forest land), where its more alert and wary relative, (*D. sumatrensis*) hardly holds its own? I think most people would say not. Certainly for practical purposes

there seems no hope of any increase, even in the unlikely event of *R. sondaicus* being in the area, and this form in Burma, can be considered virtually extinct.

To sum up, it would seem that the Kahilu area was one of, (if not entirely) the last refuges of *Rhinoceros sondaicus* in Burma, on the evidence of the skulls.

Regarding the existence of the species in other countries, I feel that the Sundarbans of S. Bengal may offer a little hope, though little is known about the number of rhinoceros, if any, that exist there today. Rhinoceros in this area, if any exist, would almost certainly be *sondaicus* as in all the available records no specimen of either *R. unicornis* or *D. sumatrensis* has been recorded from the area.

In Siam, Malaya, and Borneo, the form has probably been wiped out though known to have existed in all these countries.

In Java and Sumatra, with the present troubles in Indonesia nothing much can be ascertained, but, on the evidence of recorded ranges of Asiatic species, any rhinoceros in Java itself would certainly be the one-horned variety, though probably in lamentably small numbers. [There is a reference to *R. sondaicus* in Java on p. 35 of the Report for the years 1940-46 International Office for the Protection of Nature (Jan. 1947).]

6. THE RUMOURED EXISTENCE OF A 'PYGMY' RHINOCEROS IN THE SALWEEN AREA.

In the Game Warden's report of 1938 there is a reference to the supposed existence of a pygmy species of rhinoceros in the north of the Salween district. A tooth found some years ago was said to resemble a wild boar tush, but was triangular in shape at the base. The B.N.H.S. was not able to identify this tooth, but Sir Frank Colyer of the Royal College of Surgeons expressed the opinion that it was the lower incisor of a rhinoceros.

The animal was described as 'about the size of a large wild boar, resembling an elephant in colour with scanty bristles on the hide which is thick and similar to that of an elephant. Head resembles that of a pig and carries no horn. Large tusches protrude upwards on either side of the jaw. Lives in dense jungle preferring hill tops, is very fierce and apt to attack on sight. Buries itself frequently in a muddy burrow during the hot weather.'

The note in the Report goes on to say that there are certain grounds (exactly what is not stated) for believing that such an animal has existed in recent years in the area of the Salween and that further enquiries were being made. Nothing more about this is recorded in subsequent Game Reports. The Karen name is given as 'Ta Kheik'.

The above description is of course interesting, and if anywhere near true would suggest an animal which properly described would certainly constitute a new species and probably a new genus. However, it seems amazing that if it exists that no specimen has come into the hands of any naturalist able to figure and describe it.

One or two possibilities are suggested from the above. There is of course a likelihood of a juvenile rhinoceros of either of the known Burmese species being indicated. This would account for the absence of any horn, but hardly for the 'large tushes' or fierce disposition, and its tendency to attack on sight. It might be referable to an abnormal specimen with deformed teeth.

The description also suggests a wild pig in many respects, including the alleged fierceness, though as in all so-called 'fierce wild beasts' an attack is seldom or never genuinely unprovoked. But the Karens are well acquainted with the pig yet say this is a form of rhinoceros. Nothing is mentioned of any folds in the skin.

The animal suggested to me by the account is the Malayan tapir (*Acrocodia*), which is the only member of the perissodactyla found in Burma apart from rhinoceros. The hind feet of the tapir are three-toed and the fore feet have four toes, but as more than one authority records that the tracks of the hind feet cover those of the fore to some extent it is possible that the tracks might be taken for three-toed spoor of rhinoceros.

Also it is not difficult to imagine a tapir seen in close jungle being mistaken for a small hornless rhinoceros, especially if the white back were covered with mud or otherwise obscured, though whether the tapir ever existed as far north as the Salween in recent years is not known. What does not seem to accord with the tapir in the description is the alleged fierce disposition, the tushes and preference for hill tops.

I have questioned several Karens of the Salween and Karenni area regarding this description but could get no information, and the name 'Ta Kheik' seems unknown to those I have asked.

I imagine this animal to be on a par with the so-called 'Nandi Bear' of East Africa (a myth based on the Spotted Hyaena) that is to say a kind of legendary and composite beast, probably based on the rhinoceros, in which have become mixed up other species such as the pig, tapir and possibly others.

7. DESTRUCTION OF RHINOCEROS IN BURMA IN RECENT YEARS.

In the period covered by the Game Warden's Reports in Burma (1928-40) there are the following records of rhinoceros destroyed.

In 1930 a male *D. sumatrensis* was shot in the Shwe-U-Daung by Mr. Peacock (then Game Warden) and the skin and skeleton presented to the British Museum. This is the only record I have of any legal killing of rhinoceros in the period under review.

The number reported killed illicitly during these years are:—

1929/30	Two
1930/31	Four
1931/32	Two
1932/33	Two
1935/36	One

These together, with the one killed in Bhamo area in 1946, and three unofficial reports I have obtained, (one in Arakan 1940, one c. 1935 in Karenni and one in the Salween area 'recently', the last

two rather vague) makes a total of fifteen killed since 1928. It should be remembered that these are the known cases, no account being taken of those which have been poached and disposed of that have not been recorded.

This account omits the war years for which no information is obtainable, though there is no reason to suppose any more poaching than before took place then—one imagines that unchecked carrying of arms would not have been tolerated by the Japanese.

Previous to these years it is impossible to guess the number killed before the rhinoceros became legally (at least on paper) a protected animal. In the last 20 years, then, at least fifteen rhinoceros have been killed, probably many more, and it is very much open to question whether anything like twenty rhinoceros have been born and survived in this period.

In the Game Reports there is mention of one in 1928 and another in 1938, neither supported by very strong evidence though the latter might have been the one reported seen at the foot of Kyaikto hill in 1939. One or two young have been reported in the Shwe-U-Daung at times. General Christison records that on two occasions tracks of cows with calves at heel were observed, and then there is the report of a young one in Pegu Yomas in 1946 told to myself.

Most of these records are of course very incomplete and inconclusive. But in the areas where rhinoceros exist there is no reason why they should not, if undisturbed, go on breeding, and every reason why they should.

However allowing too for a proportion of deaths through natural causes, it is open to doubt whether the balance has been maintained.

8. PRESENT SITUATION OF RHINOCEROS IN BURMA AND PROSPECTS OF SURVIVAL.

Regarding the pre-war preservation in Burma of rhinoceros and wild life generally much has been written by far more competent pens than mine; I have already made reference to certain articles on the subject, and a list of relevant material will be found in the appendix. I have above, in para 3, given an outline of the legislative measures with which the rhinoceros are allegedly protected.

With the appointment of a whole-time Game Warden in about 1925 and the framing of the Burma Game Rules of 1927 it seemed that some progress was about to be made. But in 1931 the post of Game Warden was retrenched due to alleged financial difficulty. In the opinion of two of the writers before the war on the subject, the Game staff provided had always been totally inadequate and in his review of the Game Report for 1938 Mr. Theodore Hubback expresses sympathy with the then Game Warden (honorary after 1931) being in the position of having to build bricks without straw.

The money spent on game conservation was but a pitiful fraction of the amount derived from wild life. In the article 'Burma's decreasing Wild Life' (*J.B.N.H.S.*, Vol. XLII, pp. 155-156) Mr. D'Arcy Weatherbe gives the figure of such income from wild life

as: 1935—Rs. 38,189 and 1936—Rs. 38,758. Expenditure for these years was Rs. 3,445 and Rs. 10,350 respectively, but Mr. Weatherbe points out that revenue from licences, etc., for sporting ammunition and arms is not included under 'income'. (Why it is difficult to imagine!) Further reference to these points can be seen in Pt. III of the 'Wild Animals of the Indian Empire & the Problem of their Preservation' published in *J.B.N.H.S.*, Vol. XXXVII, No. 4 as a supplement.

After pointing out these salient features and drawing attention to the references, I will not have the audacity to make any further remarks on the pre-war position, except to remark that any real interest in those days in wild life conservation seems to have been almost entirely taken by certain of the Forest Officers, and in the face of tremendous and almost insuperable difficulties. The position, if unsatisfactory then, is a thousand times worse today. There is no Game staff permanently employed, and the number of arms is absolutely out of all rhyme or reason. Licenced arms are far more numerous than they have any right to be, and the number of illicit arms is legion. True, all these illegal arms are not used primarily for game destruction, but there can be no doubt that undue toll is taken of wild life by them. Furthermore quantities of sporting ammunition are being imported and can be purchased by anyone holding a licence in far too large a quantity and irrespective of when and where it is intended to be used.

The Army has probably done its share of poaching and I believe the Pidaung Sanctuary was badly shot over during the latter part of the war. An excessive amount of shooting goes on both in and out of Reserved Forests without any doubt at all, and equally certainly in and out of season. There is today virtually no one keeping an eye on the wild life at all.

In some cases interested Forest Officers (though unfortunately not as many as one would like to see) do take an interest and do all they can to protect wild life. Usually however such officers can only devote a fraction of their time to such work, and it is then almost certainly done in their own spare time, as their duties in forest work proper must be very heavy indeed after the war, with its attendant necessary rehabilitation, catching up with work, and general sorting out to be done. Generally, it may be said that the forest officials who take any really active part in Game Conservation today are those who have a real interest and who do it more or less solely because of personal interest, and to be perfectly frank, many of these are pre-war European officials who will in the near future be terminating their stay in Burma due to the political changes taking place in the country.

Of those forest officials who take little or no active interest in conserving wild life, who can really blame them? Their duties are heavy and apart from devoting their own free time to it, they have just not got the time and facilities. In any case it is not really their job. It is the job of a Game Department.

Unfortunately so many of those who work in the forests, though often possessing excellent local and field knowledge, have

little or no broad knowledge of the country's fauna as a whole, and hence no interest in the upkeep of it.

To most of them any animal (even in the case of the more primitive ones, and some of the small carnivora) is simply a lump of meat—and nothing is being done to educate them to a better appreciation of their country's wonderful wild life. Perhaps they live too close to it ever to see it in this way—I don't know. The people of Burma by their lack of interest certainly don't deserve to have such a wonderful variety of wild life as they possess at present.

One sometimes hears the case for Wild Life Conservation and strict control of shooting dismissed with the argument that the jungle peoples have always pursued game, and have not wiped it out up to now, the arguers forgetting that the jungle peoples have but recently come into the possession of modern weapons, and forgetting too the increase in population.

The jungle dweller upon getting a modern rifle or shot gun for the first time would no doubt think that his own particular brand of heaven had indeed smiled upon him to provide the means of getting unlimited quantities of meat, not realising in his ignorance that by abusing his newly acquired power he will, if allowed to surely eventually cut off the total supply.

A pair of junglefowl is regarded in the light of two meals—not in the light of the suppliers *next season* of possibly more than two meals, if spared, and consequently no regard is given to the observance of the close season, and almost never as things of beauty from the nature lover's point of view. Undoubtedly to the majority of people in Burma the reason for a close season is simply not known, or at least not fully appreciated, and, in too many cases, those who do realise the implications of allowing species to reproduce in comparative safety, do not give the correct example as they should.

I have diverted somewhat from the position of rhinoceros to that of Game in general, but let us see how the rhinoceros seems to fare in the light of the above conditions

To take first the negative prospects for the future survival of the rhinoceros in Burma:—

There is an appalling ignorance of fauna generally, and no realisation of the fact that the rhinoceros will surely be lost for ever unless means of a positive nature are taken to prevent this, and no realisation either of what the loss of a species means to science and to interested people all over the world. Because of ignorance there is apathy instead of any public feeling in the matter, and the widespread belief in the alleged 'medicinal' value of the parts of a rhinoceros does not tend to sympathy with protective measures.

The glaring loopholes in the law have already been alluded to. It has been pointed out by a very competent authority on rhinoceros, that, given that shooting of a rhinoceros anywhere in Burma without a Special Licence is illegal, and all export or import of any parts of a rhinoceros is also unlawful, it is impossible

to conceive how anyone, physician or otherwise, can be in bona fide legal possession of any of the said parts of the animal.

Until enlightened legislation amends the present laws there is little hope for the species surviving, let alone increasing. Excessive arms and ammunition have already been referred to, with its attendant unlimited poaching.

There are no facilities at present for the education of the public especially the younger generation, in appreciation of wild life. Incredible as it may seem, in the city of Rangoon which rightly or wrongly boasted to be one of the finest cities of the East pre-war, there was no museum open to the public (the Veterinary Research Institute and University I believe did run small museums of their own). Compare this with the fine institutions in Calcutta and Bombay and other Indian cities, and the number of visitors to these places, and it speaks for itself.

Is any country so poor that it cannot afford to preserve its treasures of Art, Culture and Natural History, for the benefit and enjoyment of the present generation and posterity? Is it because a museum is non-political and non-profitmaking that no interest is taken in it in Burma?

The unsettled state of the country and its bearing on Wild Life Conservation generally, and rhinoceros in particular, needs no comment.

A negative factor as far as rhinoceros prospects are concerned is the possibility of separation of certain hill tracts from Burma proper—many of the present haunts of rhinoceros being in the very areas concerned. What will eventually happen I am in no position to judge, but separation of these parts would undoubtedly mitigate against rhinoceros as practically all the hill tribes of Burma are notorious poachers and have no regard for future conservation whatsoever, their ignorance and apathy in this respect, even among the educated ones being almost unbounded—not their fault of course, for they have never been educated to think other than they do.

There is a tendency in Burma not to be amenable to discipline, and to regard any restrictions imposed, however much in the public interest, as unjustified, and of which the abolition should be pressed without delay. I read in a letter to the editor published in a Rangoon paper recently, a proposal that the Government should allow everyone to carry arms with no licences or restrictions!

To consider the positive factors for the prospects of rhinoceros in Burma, one finds they are lamentably few.

Chiefly, these are the elusive and retiring habits of the rhinoceros, and in Burma, (as Mr. Hubback has written of the rhinoceros in Malaya), their survival to date has probably been due to this, plus their inaccessibility generally of location, more than to any other factor. In the case of the Shwe-U-Daung there are, too, the Spirits reputed to frown on poaching, and it is to be hoped that eventual disbelief in these spirits does not preclude some sort of desire to retain the species in Shwe-U-Daung, or they may possibly be poached out of existence.

Coupled with the remote haunts of the rhinoceros is the resultant lack of any serious conflict of interest between the claim of the species and cultivators. The fact that so much of Burma's resources and wealth lies in the forests tends to be a positive factor in so far as it ensures the upkeep and preservation of huge tracts of natural habitat, though timber cutting in any of the rhinoceros areas would no doubt disturb the animals for a time.

The rhinoceros at present do little or no harm to anyone, and any claims that rhinoceros are doing damage to cultivation should be most carefully investigated, as, there are many in Burma who would welcome any opportunity to molest this inoffensive beast.

The factor that one would expect to have a good influence on Wild Life Protection generally in Burma, but which actually seems to leave much to be desired, in this respect, is the Buddhist religion. Buddhists, according to the dictates of their religion, should kill no living thing. In a Buddhist country, therefore, one would expect some measure of protection for the fauna automatically, irrespective of legislation. The insincerity in this respect of the Buddhist religion as practised in Burma today is obvious.

From the point of view of rhinoceros in particular, the peoples occupying their habitation in the hill country are in many cases the hill tribes, for the most part either animist or Christian so the remarks about Buddhism hardly apply. Nevertheless, had the Buddhists of Burma (the vast majority of the population) not been content to sit back and watch the fauna of their country decimated by ruthless poaching and by all manner of unsporting methods, the position as a whole would have been much better.

Any future proposals for Game Preservation in Burma should endeavour to enlist the support of the Buddhist priests, who doubtless, could wield a strong influence over large sections of the populace in this direction. Before the war, I believe a few Buddhist priests did do a little in this way and tried to establish small local sanctuaries. Such efforts deserve all possible support (including official recognition).

That rhinoceros will respond to strict protection is shown by the facts about the following efforts at conservation in India and elsewhere. (Admittedly I quote reserves for other species.)

The Kaziranga Reserve for *R. unicornis* in Assam is full of the species today, and by all reports they are steadily on the increase. Last year two separate parties were quoted in the *Journal* of the Society for the Preservation of the Fauna of the Empire as having, (from an elephant) each seen a number of rhinoceros (including some calves) in a very short time, one party seeing eleven in the course of a brief visit of a few hours only.

Poaching of rhinoceros in Nepal has, I believe, been eliminated, due to the Government having the power to enforce its own laws.

The Jaldapara Sanctuary in North Bengal is also for *R. unicornis* and was constituted in 1932 to save the rhinoceros in the area from being poached out. In 1930-31 about fifty were killed, this number of skulls being found in 1932 and 33. Before this it had

been estimated there were 80 specimens in the area, so the extent of the reduction can be realised.

After the 14 years or so of preservation it is estimated that today there are about fifty in the Sanctuary.

It would seem that the rhinoceros (at least *R. unicornis*) is a steady, if slow, breeder and this doubtless augmented by the probability of few dangers to the calves, in the way of natural enemies.

I have not much information about the present state of protection of the two African species but it would appear that both the Northern and Southern races of the rare *Ceratotherium simum*, (the 'white' rhinoceros) are fairly well provided for and in no immediate danger. It is of interest to note that the Southern race of *C. simum* has often been written of as 'totally extinct' or 'dying out'; while in actual fact there are probably more of them in existence than there are *D. sumatrensis* in the whole of Burma, and there is every prospect that these African square lipped monsters will not be allowed to perish at the hands of man.

Through the wastefulness and greed of man, *Rhinoceros sondaicus* has been exterminated in Burma. A former Game Warden (Mr. E. H. Peacock) records his opinion that had the necessary steps been taken they could have been saved. It is not quite too late to save *Dicerorhinus* from extinction in Burma but certain steps are essential if this is to be effectively carried out.

Most of the following has been pointed out before, but it does no harm to repeat it once again.

It is absolutely imperative that a Game Warden and Game Staff be appointed without delay, and that sufficient funds be set aside for Wild Life Protection, from revenues derived from wild life (sporting arms licences, game licences, elephant kheddah licences, etc.).

As has been so often pointed out, all this revenue is a *direct* result of the existence of wild life, and unless ample provision is made to safeguard it, it will be so nearly exterminated in a few years that this source of revenue will have ceased to exist. If the Government of Burma must be mercenary about it, why cannot wild life be regarded as a natural resource of the country, much on a par with the forests. One does not expect to go on deriving revenue from the forests without maintaining a Forest Department. It is illogical to expect revenue from wild life to continue if nothing is done about its upkeep.

Could not the Government be content with a small annual revenue for transfer to other departments and regard the wild life in the light of a long term investment? No one has ever advocated a Game Department that does not pay for itself, and it should be possible also to make a little over which could then be transferred to any other department at the discretion of those responsible for such matters.

As far as wild life in Burma is concerned the policy today is of killing the goose that lays the golden eggs. A revision of the futile and inadequate legislation concerning rhinoceros in Burma coupled with a realisation that the best laws are of little use unless

the machinery exists to enforce such legislation, is an essential measure to save the species.

The issue of sporting arms and licences should be strictly controlled, and their issue coordinated with the relative stock of game in the areas over which it is proposed to allow shooting.

There should be an effort made to educate the people of Burma in appreciation of wild life, and an attempt to eliminate the prevalent idea of fauna (and flora too) being the property of anyone who can and cares to take it for himself. At present there is no idea at all that the fauna and flora belong to, and are an integral part of the country as a whole.

The formation of a Wild Life Protection Society and/or a Natural History Society would be a great step forward, but like so much else in Burma, such may be (and, I believe, in the past has been) talked of for years and nothing done. It should be remembered that such movements are almost invariably the result of the labours of a very few interested people in the first instance.

Finally, no effort should be spared to keep the present sanctuaries intact, improve them and where necessary form new ones. They should all belong to some sort of National Trust and remain permanently inviolate. The ultimate aim should be to make National Parks of those suitable for such.

I have heard of proposals to exploit timber or other forest resources in both the Shwe-U-Daung and Kahilu Sanctuaries. There is nothing whatsoever to justify this step, and it would be folly to allow it to be done. A wild life sanctuary implies that the flora as well as the fauna should remain as Nature made it. Is anyone in his right mind to believe that any timber concern is really going to stand or fall by the amount of teak, etc., that can be got out of so few square miles, considering the total huge forested areas in Burma? One can only hope that commercial interests will not be allowed to get their greedy hands on these sanctuaries.

It is probable that in ten or fifteen years' time Burmans visiting, say, the National Parks of Canada or U.S.A. will ask 'Why can't we have some National Parks like these in Burma?' and the answer will be: 'You could have had, if farsighted and wise measures were taken a few years ago, but it is too late now. the opportunity is gone forever.'

It would, indeed, be a sad reflection on past policy if, when the time comes that people in Burma have the leisure and desire for National Parks nothing worthwhile were left to show them.

If the above necessary measures are carried out it would seem that there is a good chance of keeping the Burmese rhinoceros in the Shwe-U-Daung, Uyu area and the Arakan in perpetuity and there might be some chance of an increase in the stock in these areas. In all these places there seems every opportunity for them to breed if undisturbed.

If, as I am compelled to believe will be the case, nothing is done it will mean that the ultimate fate of *Dicerorhinus sumatrensis*

will be the same as of its larger relative *Rhinoceros sondaicus*, though a few isolated specimens may remain in the more remote tracts for several years before finally succumbing to the inevitable.

APPENDIX A.

REFERENCES TO RHINOCEROS IN BURMA AND RELEVANT LITERATURE.

- Jerdon.—Mammals of India, p. 234 (1870).
 Sterndale.—Mammalia of India, p. 405 *et. seq.* (1884).
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 Lydekker.—Catalogue of the Ungulate Mammalia in the British Museum Vol. v, p. 46 *et. seq.* (1916).
 Stockley.—Big Game Shooting in the Indian Empire (1928).
 Peacock, E. H.—A Game Book for Burma, Chapters viii and ix (1933).
 Annual Reports of the Game Warden, Burma, 1928-1940.
 P.Z.S.—1869 p. 409; 1873, p. 104; 1875, p. 566.
 J.B.N.H.S.—Vol. xvi, p. 555, 'Notes on Rhinoceros in Burma' (Major G. H. Evans, F.L.S.) (1905).
 J.B.N.H.S.—Vol. xxiii, p. 772, 'The Asiatic Two-horned Rhinoceros' (*R. sumatrensis*, Cuv.) by G. C. Shortridge (1914).
 J.B.N.H.S.—Vol. xxxviii, No. 1, p. 137, 'Rhinoceros Shooting in Burma', by W. S. Thom (1935).
 J.B.N.H.S.—Vol. xxxix, No. 3, p. 606, 'Note on the Burma Wild Life Protection Act' (1938).
 J.B.N.H.S.—Vol. xl, No. 4, p. 594, 'The Two-horned Asiatic Rhinoceros (*Dicerorhinus sumatrensis*)' by Theodore Hubback (1939).
 J.B.N.H.S.—Vol. xl, No. 4, p. 618, 'Additional notes on the Asiatic Two-horned Rhinoceros', by S. H. Prater, C.M.Z.S. (1939).
 J.B.N.H.S.—Vol. xli, No. 1, p. 146, 'Memorandum on the Kahilu Sanctuary', by D'Arcy Weatherbe (1940).
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 J.B.N.H.S.—Vol. xlii, p. 150, 'Burma's Decreasing Wild Life' by D'Arcy Weatherbe (1940).
 J.B.N.H.S.—Vol. xliii, p. 257, 'A Few Notes about the Five Rhinoceros of the World' by W. S. Thom (1943).
 'Wild Animals of the Indian Empire and the problem of their Preservation', Pt. III, Supplement to *J.B.N.H.S.*, Vol. xxxvii, pp. 112-188.
 Journal of the Society for the Preservation of the Fauna of the Empire June 1946, Pt. III, p. 46.
 Journal of the Society for the Preservation of the Fauna of the Empire Dec. 1946.

APPENDIX B.

ADDITIONAL DATA ON *Rhinoceros sondaicus*.

Published in the *Journal* of the Malayan branch of the Royal Asiatic Society (Vol. XV, p. 130, *et seq.*) in 1937 was an article entitled '*Rhinoceros sondaicus*, The Javan or Lesser One-horned Rhinoceros and its Geographical Distribution' by Charles W. Loch.

This article came to my notice after the MS of my notes relating to the rhinoceros in Burma had been completed and, though it is not primarily concerned with Burma, I feel that it is of such considerable interest (and probably not obtainable by many at the present time) that a short note on the gist of the article may appropriately form an appendix to my notes.

The article gives a full and interesting survey of the recent range of *R. sondaicus*.

Records of specimens that were actually killed and identified are quoted from Bengal (latest 1874), Assam (latest 1874, Manipur) Burma (latest 1920, shot by Mr. Hubback at Victoria Point), Siam, Malaya (several good records, latest 1932), Sumatra (latest 1933), Java, Indo-China and Borneo (doubtful, with a remark that Mr. E. Banks, of the Sarawak Museum, did not believe *R. sondaicus* to exist in Borneo really).

Mr. Loch estimated that at that time (1937) there were about 66 ('probably less than 70 and more than 40') in existence made up of 4 in Burma, 6 in Malaya, about 6 in Sumatra, about 24 in Java, 8 in Siam, and about 18 in Indo-China.

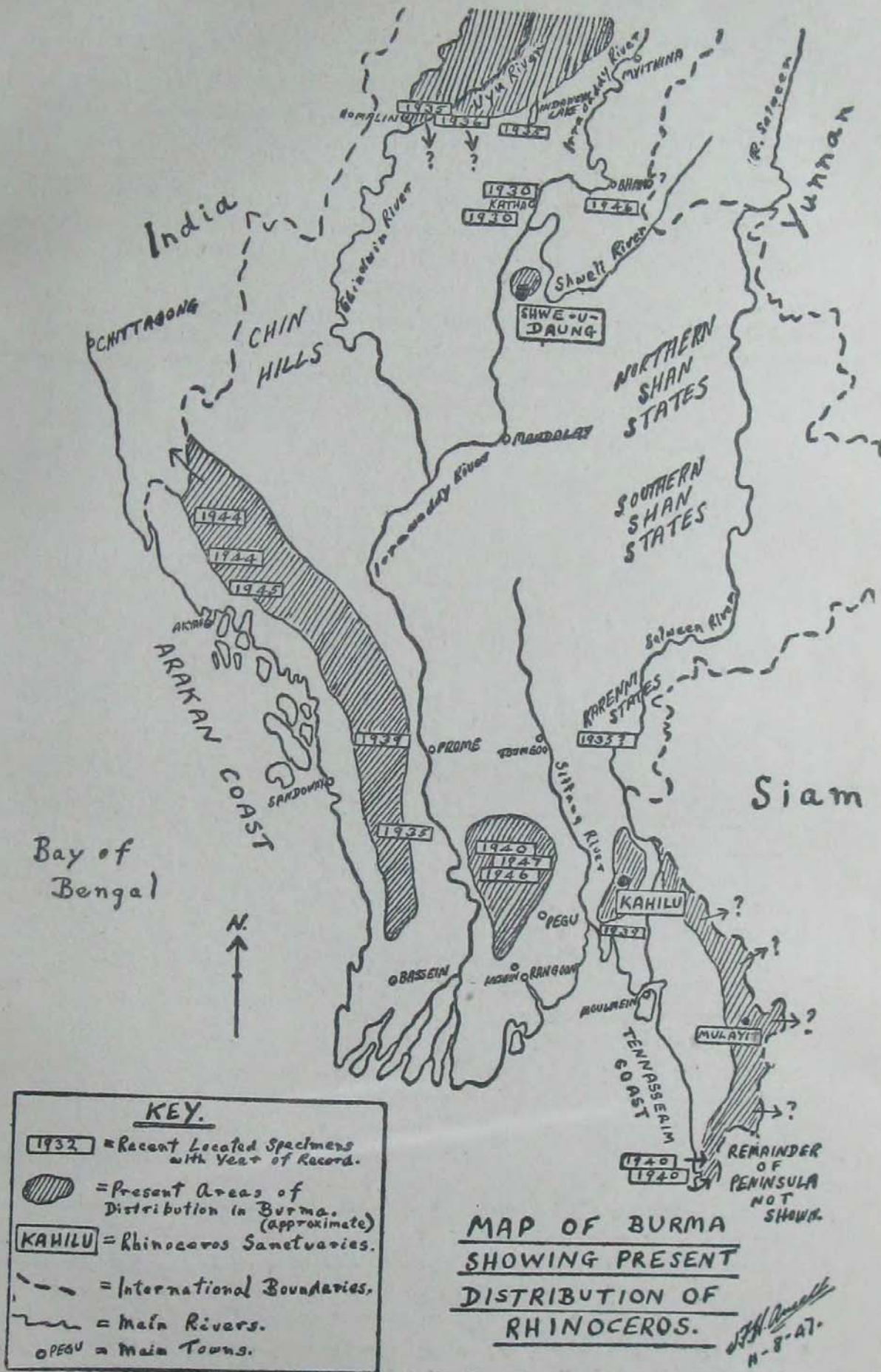
He considered the species extinct in Bengal and probably so in Assam, probably non-existent in Borneo and had no records from Yunnan and Kwang-si.

This estimate would seem to be very optimistic, especially if the evidence in the other countries was no more reliable than that from Burma was shown to be when analysed by Mr. Weatherbe.

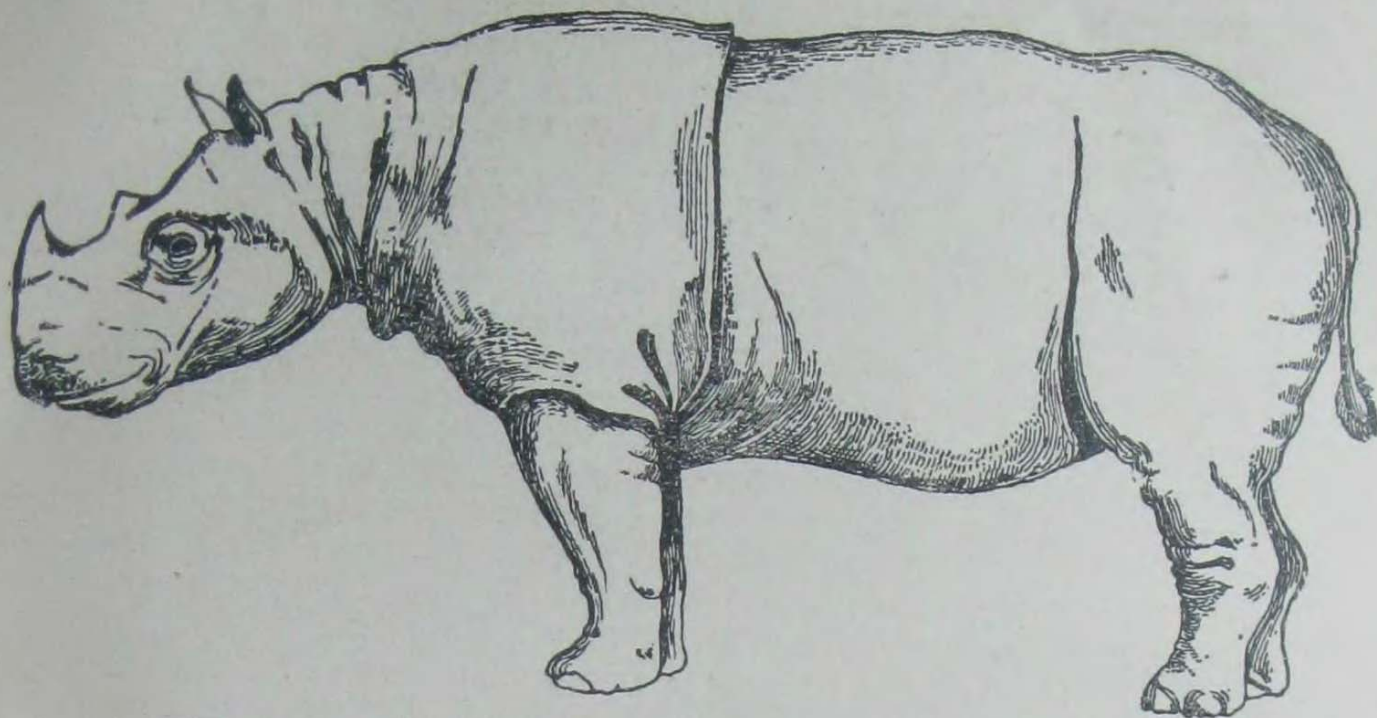
In any case it appears almost certain that today (ten years later) nowhere near sixty of this rare mammal exist.

It is particularly regrettable that the areas where the article quoted *Rhinoceros sondaicus* as being most plentiful (Fr. Indo-China and Java) are today the very areas where there is most trouble and unrest, and just the places where the species would seem to have the least chance of survival. Especially is it unfortunate in the case of the Cedjoenkoelon Peninsula of Java, where there was reported to have been a dozen or more *R. sondaicus* in a reserve, formerly closely guarded and protected. (All the rhinoceros of Java would belong to the *sondaicus* variety on the evidence of *D. sumatrensis* never having been recorded from the island.)

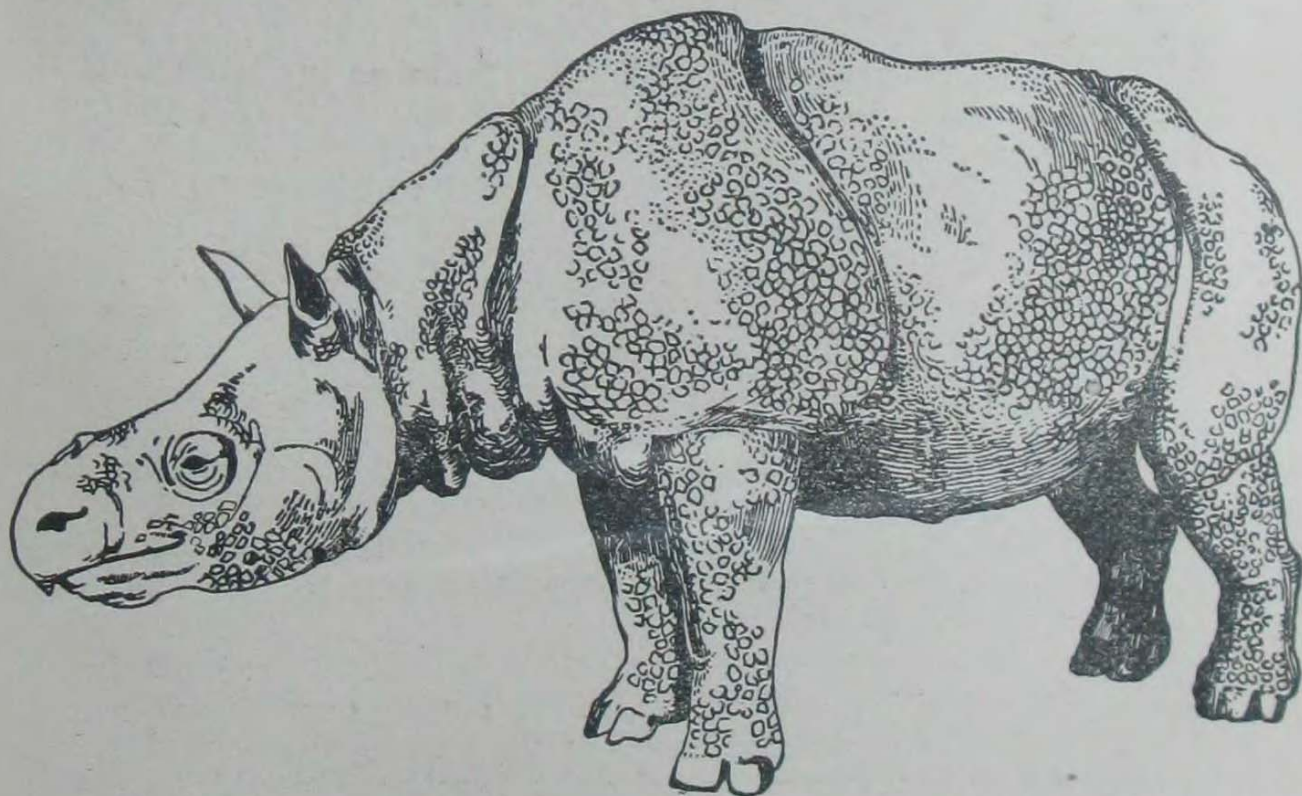
The article under reference gives a map, and two plates of mounted specimens, (m. & f.) of *R. sondaicus*, and a table showing the known specimens in the museums of the world. There is also a list of references to literature on the subject.



Mr. Ansell's article on Rhinoceros.



The Sumatran Two-horned Rhinoceros [*Dicerorhinus sumatrensis* (Cuv.)]
(Height at shoulder about 52 in.)



The Smaller One-horned Rhinoceros (*Rhinoceros sondaicus* Cuv.)
(Height at shoulder 70 in.)