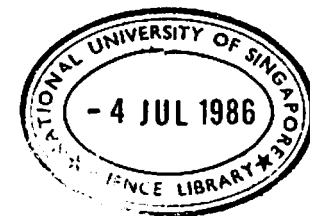
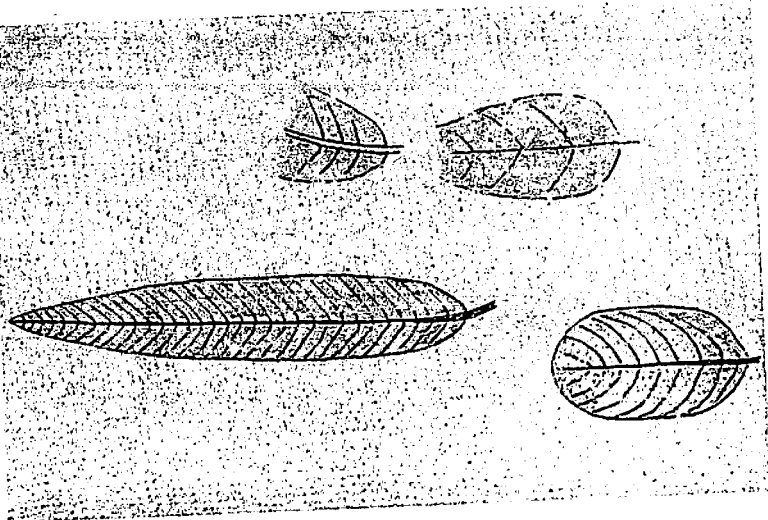


NATURE CONSERVATION
IN
WESTERN MALAYSIA, 1961

An issue to mark the occasion of the
TWENTY-FIRST ANNIVERSARY
of the founding of the
MALAYAN NATURE SOCIETY
1940 — 1961

Edited by
J. Wyatt-Smith and P.R. Wycherley





C. R. Jones
Tertiary fossil plants from the Enggor
Coal Beds, Perak (approx. x 0.6)



C. R. Jones
Closely folded Lower Silurian flag-stones containing
graptolites, Pulau Tanjung Tembus Dendang, Lang-
kawi Islands.

PREHISTORIC FAUNA CHANGES AND LOSSES IN BORNEO

By

TOM HARRISSON*

We are well below and beyond the normal limits of radio-carbon (C-14) dating—about 50,000 years—in excavations at the Niah Caves in Sarawak (archaeological results are reported regularly in *Sarawak Museum Journal*, including special supplements in Nos. 12-13, now in Press). Down to this level and beyond, the teeth and bones of mammals, birds, fish, reptiles occur in quantity as the food remains of prehistoric stone-age men, who occupied this enormous cave system from before 50,000 B.C. until quite recent times. Indeed for four months in the year colonies of Malay and Punan birds' nest collectors still live in permanent cave dwellings to this day, while gathering the *Collocalia* swiftlet material for Birds' Nest Soup.

All excavated food remains are carefully preserved, identified, packed and sent to experts in Europe and America for specialist study when necessary. Work on birds, fish and reptiles is still developing, mainly at the Chicago Natural History Museum, which makes a generous annual grant to the Niah project to promote this aspect. Mammal bone has been the subject of exhaustive study by our colleague, Lord Medway, at the University of Birmingham in England; he has also actively participated in three seasons' diggings at Niah. Certain mammal bone has also been studied by the Earl of Cranbrook (bats), Dr. Edwards Hill of the British Museum (squirrels), Prof. G. H. R. von Koenigswald (teeth) at Utrecht and Dr. D. A. Hooijer (deep old material) at Leiden in Holland.

With this help, plus my own general observations as regular controller of the excavations and the work of Sarawak Museum collectors (an Iban Dayak, a Kelabit and a Malay) in compiling reference collections of the living local fauna for comparison, we are beginning to get a picture—however incomplete—of the "natural" changes in at least the edible and catchable past fauna of West Borneo.

* * * * *

Several major impressions so far received from this side of the cave work may be briefly stated here.

1. The Upper Pleistocene (archaeologically late Palaeolithic) fauna is very much more similar in general to present day than has often been

* Curator of the Sarawak Museum, Kuching.

supposed. Most species are the same, except for those clearly hunted to extinction as indicated below.

2. *But* many examples of existing species at deep (= old) Niah levels tend to run *larger* than any living examples. Some of those may deserve subspecific distinction.

3. On the other hand, there have been some surprising *changes* in the *quantitative components* of the local fauna—including even the bats living in the caves (some forms very common in the past are now scarce or locally absent and vice-versa).

4. At least three and probably four large animals all stated to occur in Dayak folklore and still found in Malaya are now proved in Borneo from stone-age levels at Niah.

5. Other large animals found abundantly as stone-age food do not now normally occur within hundreds of miles of Niah—notably orang utans.

6. Below 50,000 years the fauna is *still* overwhelmingly akin to modern with one tremendous exception—a Giant Pangolin hitherto only known from the Middle Pleistocene fossil beds of Java (a single specimen) and at Niah represented by true, non-fossil bone.

It will be clear that the last four of the above conditions could each be attributed to human influence; while the second, size change, could also be in some cases due partly to constant hunting out of larger forms by man. Indeed, as the Niah story unfolds, in this and in many other ways one feels that man began to *exercise major and often decimating influences on the local fauna very long ago*. That is to say: that he was more numerous and powerful—at least in Borneo—than has usually been supposed. And that he in fact needed then, almost as now, Wardens and a Conservation Service to protect big game and his descendants against his own skills as a hunter and greed as a protein-eater.

These are animals definitely identified in stone-age levels at Niah and certainly now no longer to be found anywhere within conceivable hunting range thereof:

- (i) Giant Pangolin—extinct in Pleistocene (see below).
- (ii) ? Elephant—nearest now are fertile herds 300 miles to the north-east.
- (iii) Tapir—extinct in Borneo before historic times.
- (iv) Sumatran Rhinoceros—probably none left in Sarawak and only a handful in all Borneo; used as charms and in one case

as a middle stone-age burial *pillow*, as well as in ordinary food remains in these caves.

- (v) Tiger—extinct in Borneo before historic times.
- (vi) Wild Buffalo—previously doubted as part of the endemic fauna; no longer extant.
- (vii) Orang-Utang—clearly once abundant; nearest now 200 miles.

I should add that all these, except the rhino, were finished locally long *before* the Brookes and shotguns came into nineteenth century history; and that for some centuries before then the Niah area was only inhabited by wandering nomads, for reasons which need not detain us here—but which gave the local large fauna an optimal chance of survival or recovery. (The Wild Ox or Seladang alone remains quite numerous; and this is one of the few places where it is so in Borneo today).

* * * *

There are certain ironic undertones or odd associations about some of these stone-age extinctions round Niah. For instance, there is no acceptable record of a tapir in Borneo in the past few hundred years, and at Niah none occur higher up in the deposit than late stone-age (i.e. c. 2,500 + years ago). All the same, the many harsh things that have been said—by me included—about the government of North Borneo showing tapir on a popular postage stamp issue ring a little hollowly prophetic (in reverse) now.

There are some indications that big oranges may have been kept as pets or for sacrifice inside the caves as long as 20,000 B.C. And it is possible that they were brought from long distances to Niah, just as Cassowaries are walked up from the coast right into Central New Guinea for similar reasons today. Also much earlier, around 50,000 B.C., was the Giant Pangolin perhaps similarly kept?

This Giant Pangolin, *Manis palaeo-javanica*, was hitherto known from a single fossil specimen described by Dubois from a geological horizon supposed to be c. 500,000 B.C. in Java, and linked indirectly to his Java Man (*Pithecanthropus*). It was three times larger than any living pangolin. Now Dr. D. A. Hooijer, keeper of the Dubois collection at Leiden, identifies identical bone but NOT fossilised, from the early stone-age depths in Niah.

This pangolin is a huge relation of the common Scaly Ant-eater (Malay *tenggiling*) still numerous in Borneo, Java and Malaya. Curiously enough, there is evidence that a not too distant relation and another

giant extinct form, the Giant Sloth of South America, was kept in captivity by stone-age men in some Patagonian caves on that continent!

For it is alas often the case that when men learn to *love* certain animals, they may *kill* them with kindness by capturing too many, almost as readily as with cruelty in traps. That is precisely why the few remaining orang in Borneo and Sumatra (only) are today threatened with extinction. No one kills them as food. But far too many people—mainly in Indonesian territory—kill the parents in order to collect the babies for sale as pets. Some seventy-five per cent of the babies, too, die from bad feeding and neglect *before* they ever reach a buyer.

Even odder, in this respect, is the case of Borneo's *stone-age dog*. The expert on stone-age dogs is Dr. Juliet Clutton-Brock at the Institute of Archaeology, London. She has now shown that in the late stone-age at Niah, and at another of our cave sites near Kuching four hundred miles further west, men had domestic dogs. Moreover, these bear no resemblance to the *pye* dogs which dominate the whole island today. These were little, delicate pet dogs — not lousy, big pig-hunters. The nearest relation known is the also extinct stone-age dog of Japan. Both have vanished, leaving no trace of their breed in modern types.

* * * *

I have touched on a few aspects only, from the marvellous wealth of our Niah and other cave results since we began this work at the Sarawak Museum—greatly aided at first by Mr. Michael Tweedie, then Director of the Raffles Museum. I have indicated that problems of conservation are not only pressing but also intricate; and that they are not merely the results of modern development, but concomitant *with the whole process of man's evolution*—and the world's? This is not for a moment to suggest any defeatist or negative attitude. But it is as well, perhaps, in facing the grave problems before us in the second half of the present century, to have this mild corrective of perspective from centuries and millenia out of man's often rather shoddy and still very shadowy past.

PART III

NATIONAL PARKS

THE DISTRIBUTION OF ELEPHANT, RHINOCEROS, SELADANG AND TAPIR IN MALAYA'S NATIONAL PARK

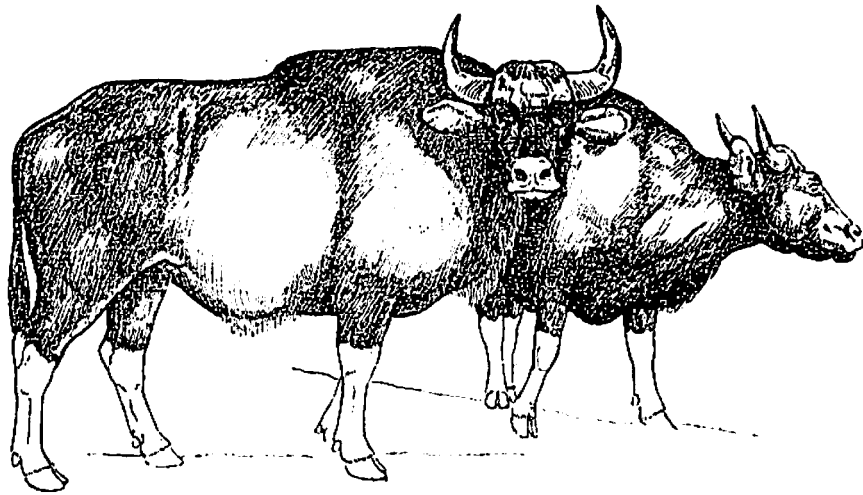
By

J. A. HISLOP*

Taman Negara or King George V National Park, Malaya's National Park, was set aside as a wild life sanctuary in 1937 to commemorate the Silver Jubilee of King George V from whom its name was given. It is situated in the States of Kelantan, Pahang and Trengganu and surrounds the Tahan massif (7,186 ft.), Malaya's highest mountain. The portion accessible to visitors is that contained in the State of Pahang, bounded on the south-east by the Tembeling river. The head-quarters is at the confluence (*kuala* in Malay) of the Tahan with the Tembeling river; it is reached by train to Tembeling Halt and then by boat up the Tembeling river.

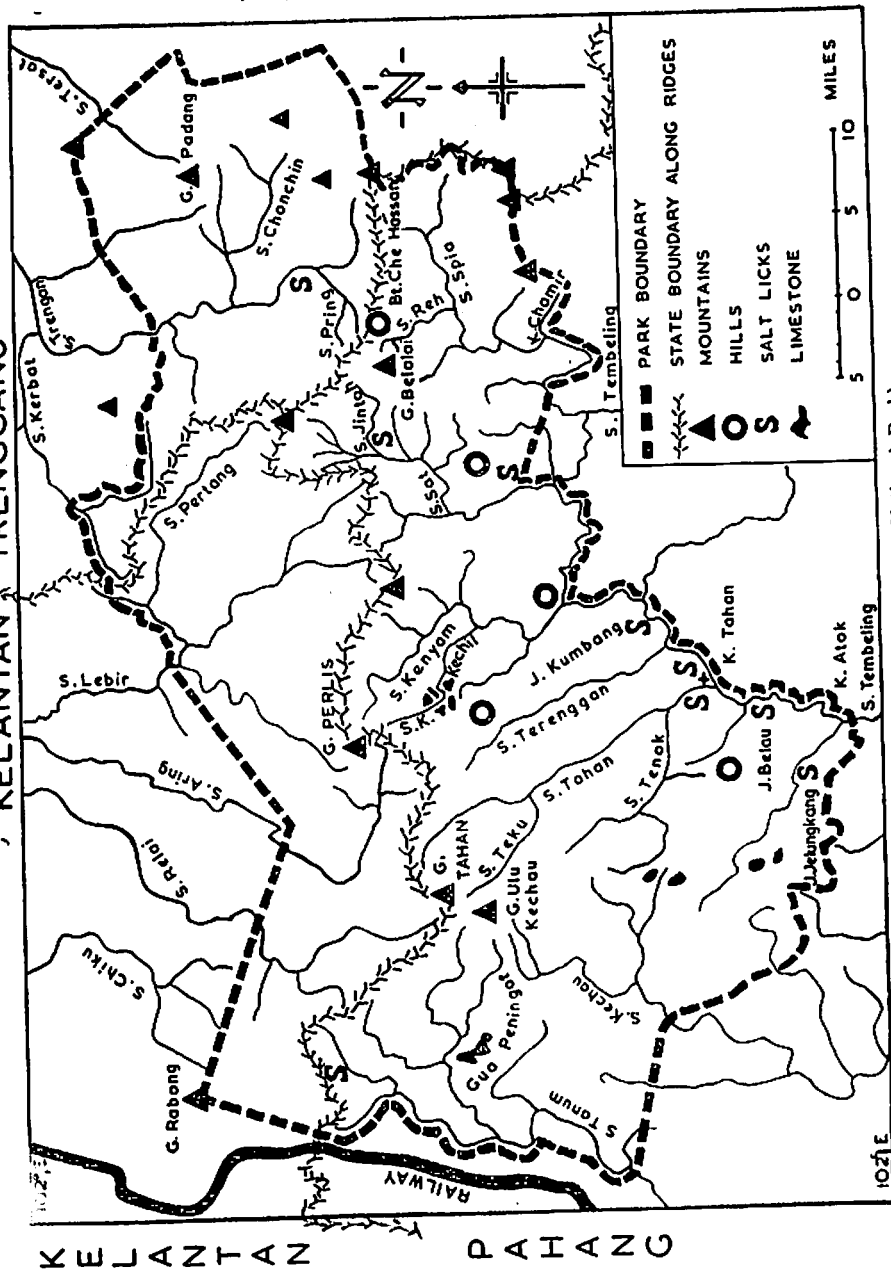
The Park covers an area of 1,677 square miles of typical Malayan mountain, forest, river and stream, and contains most species of indigenous wild life and vegetative growth excluding that typified by estuarine and coastal areas. Of this vast expanse, however, only that portion lying within the State of Pahang is relatively well known, since there has been little opportunity in the past for exploration and research. It is therefore impossible to arrive at any accurate conclusions regarding the populations of the various animals, their seasonal movements and destinations, favourite habitats and so on, but over the years sufficient information has been gleaned to conjure up a rough picture of the distribution of the large wild life within the Park. Wild animals, however, are quite indifferent to boundary lines, marked or unmarked, and the population is therefore a shifting one, but it is safe to say that there are large areas within the Park perimeter which contain very few of the larger animals, and that the numbers of the various species may be considered small in relation to the area available.

Elephant (Elephas maximus). A herd of from twelve to fifteen animals frequents the lowland southern part of the Park from Kuala Atok to Kuala Tahan, moving on both sides of the Tembeling possibly as far upstream as the Terenggan. Periodical visits are made to the Tahan salt licks, especially Jenut Belau. The valley of the Tahan beyond Kuala Tenok is seldom frequented by elephant except for wandering lone bulls, but to the south and west as far as the upper Kechau, there exists an unknown number. Further west still in the vicinity of the Tanum river and its tributaries, and around the limestone



* Chief Game Warden, Federation of Malaya, 1957-60.

T R E N G G A N U P A H A N G



Taman Negara (King George V National Park).
Based on Survey Department Material. Government Copyright is reserved.

massif of Gua Peningat, there are several salt licks and the elephant population there and north to the Park boundary in Kelantan is probably the most intensive of anywhere in the Park.

In the vicinity of Kuala Teku, however, on the east side of the Tahan, tracks of a small herd of up to half a dozen head have been recorded on one or two occasions, but they undoubtedly come over from the upper reaches (*Ulu* in Malay) of the Kenyam Kechil, a pleasant valley containing many large limestone outcrops, and much frequented by a large herd distinct from the small one of twelve to fifteen animals already referred to in the Atok-Tahan area. Their tracks have been noted a short way up the main Gunong Tahan ridge, eventually heading down into the Tahan some distance above Kuala Teku, but the tracks of lone bulls have been seen much higher on the ridge and also at over 6,000 ft. on the Tahan massif itself.

Proceeding up the Tembeling river from Kuala Tahan, the next valley is that of the Terenggan which contains the large salt lick of Jenut Kumbang. In years gone by this lick was well patronised by elephant but it has become much less popular and is now seldom visited. Several miles further upstream there is the much larger valley of the Kenyam which although it has the appearance of being suitable for elephant, does not seem to be inhabited by any herd, the nearest being the large herd already mentioned and which is located in the Ulu Kenyam Kechil. There is no evidence that this herd comes down into the Kenyam at all, and a number of personal journeys on foot have failed to find used trails although the terrain is not in the least bit difficult. Lone bulls, of course, wander in many places where herds do not go, and damage to fishing camps in the Kenyam has often been done by them.

Further east still is the Sungei Sat in which are located one or two salt licks, the most important being Jenut Jintoh, well away in the upper reaches of the river and well patronised by elephant. There is no information available as to the size of the herds in the Sat valley, and it is most probable that these animals wander northwards across the low divide via the Pertang into Kelantan. A lot of rough country divides the Sat from Spia to the east, especially in the upper reaches, and elephants are few. A small herd occasionally appears in the vicinity of Kuala Chamir, and doubtless odd ones wander about the ridge trails over to Trengganu, but in general the population from the Sat eastwards to the high range dividing Pahang and Trengganu is small.

A survey in 1952 of the upper reaches of the Reh and Kenering in Pahang, thence over Bukit Che Hassan into Trengganu and the valleys of the Kenering, Pring, Ulu Trenggan, and Chonchin rivers and on the plateau (4,000 ft.) of Gunong Padang produced little or no evidence of

elephant apart from the occasional tracks of lone bulls, and these were few and far between.

Herd elephant undoubtedly exist in some numbers in Trengganu to the north of the Park boundaries, notably in the valleys of the Kerbat and lower reaches of the Trenggan, but nothing is known of their visits to the Park and although some of the country traversed was quite suitable for them, there being an abundance of bamboo and other food, indications of herd elephant were conspicuous by their absence.

Elephants are fairly numerous in that part of the Park which lies in Kelantan and which contains the rivers Aring, Relai and part of the upper reaches of the Lebir.

It is not possible to estimate the numbers of elephant which from time to time inhabit the National Park, but it is certain that there are other parts of the country where they are more numerous, for example in Upper Perak, some parts of north-west Pahang and parts of Johore. It appears evident, however, that the elephant population in the National Park is greatest in the western sector, that the north-eastern area on both sides of the Pahang—Trengganu watershed and the valley of the Tahan river contain very few, particularly the latter which is poor elephant country, and that the best known part of the Park, the mid-Tembeling area, holds a few small herds.

Rhinoceros (Didermoceros sumatrensis). It is certain that very few individuals exist within the boundaries of the Park. C. S. Ogilvie has recorded tracks from the valley of the Spia in the Kuala Chamir area in the eastern part of the Park and a visual record was reported by a ranger from a few miles further up the Spia. G. R. Leonard made a survey of the country to the east of the Spia up to Trengganu border. He found many wallows but very few indications of anything fresh, but the evidence nevertheless was conclusive that one or two animals still wander around the upper reaches of the Spia. In the writer's opinion there would be more chance of finding them in the very rugged and broken country to the north of the Spia surrounding Gunong Ulu Reh (Belalai).

The writer has personally covered a great deal of country from Gunong Tahan eastwards to Ulu Trengganu, and has found no evidence of existing rhinoceros although old wallows are common. Aborigines have told me that there are one or two in the steep country of the source of the Kenyam, but these reports have never been verified.

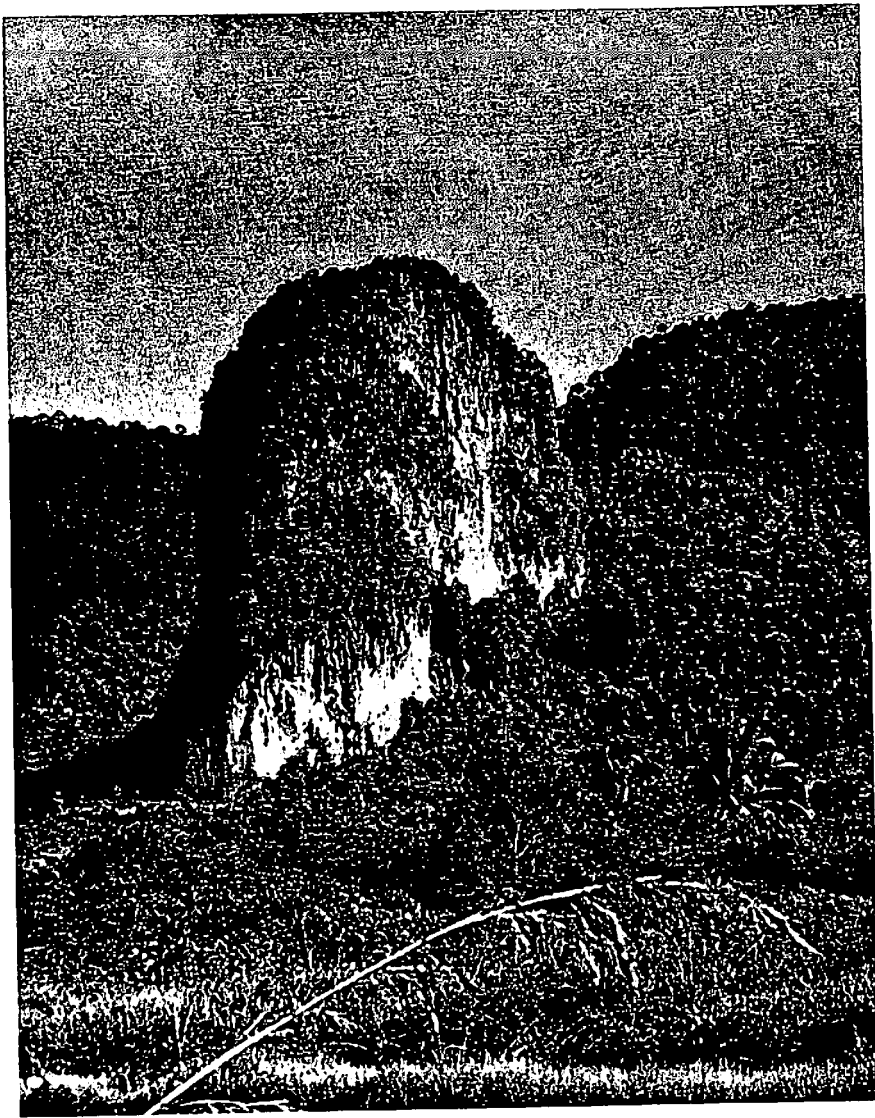
Seladang (Bibos gaurus). It would be relatively simple given time, to estimate the numbers of Seladang, since the herds tend to be more localised than those of elephant and to spend more time in any one particular place.



Photos: J. Wyatt-Smith
Sungei Teku gorge.



Teku gorge, Taman Negara.



J. Wyatt-Smith

The limestone hill Bukit Takun standing in Forest Reserve behind Templer Park, Selangor.

In the southern part of the Park, from the Trenggan river to Kuala Atok it is estimated that there is a population of no more than thirty animals. The well-known herd which frequents Kuala Tahan, and which remains in the vicinity for periods of up to a month or more, has been known to contain as many as twenty-four head, although usually fewer. This herd is prolific and calves numerous, but the number of mature animals in the herd never seems to increase in proportion to calves produced, and it is possible that casualties to the youngsters are relatively high. It would seem reasonable to assume that young bulls not yet strong enough to compete with the master for leadership of the herd, may break away with a few cows to form the nucleus of a new herd. If this were so a gradual increase in population would result, but there is no evidence to show that new herds are in fact being formed. On the other hand, observations made at Kuala Tahan since 1947 show that particular animals remain with the herd for years, and one well known cow, named 'Curly Horn' produced several pairs of twins before she passed away. The master bull also remains in charge for years, until beaten in battle, and C. S. Ogilvie has recorded a clash which resulted in the death of both contestants, it being quite an appreciable time before a new herd bull appeared.

The fine valleys of the Kenyam and Kenyam Kechil rivers in the central part of the Park seem not to hold any resident herd, although tracks of solitary bulls have been recorded, and the writer once crossed fresh tracks of a fairly large herd along the Permai river in the lower reaches of the Kenyam, but it is not known where they went. There are in the valley of the Sat some animals which visit Jenut Jintoh, but no Seladang have been recorded from the Spia, and the next herd of any size is found over the divide, inhabiting the valley of the Pring and upper Trenggan in Trengganu in the eastern part of the Park. There is a salt lick a few miles downstream from Kuala Pring, and a well used route from there to the upper reaches of the Trenggan and across a low divide into the Pring. Further into Trengganu, on the great sand and pebble banks of the Chonchin at the foot of Gunung Padang, tracks of Seladang may be found, but since the Chonchin and Trenggan are only a short distance apart and separated by relatively low ground, it is thought that periodical visits are made by the Trenggan herd.

Tapir (Tapirus indicus). Tracks of tapir are often mistaken for those of rhinoceros, and these wary animals are quite numerous in the National Park from lowland swamps to the steepest slopes and high ridges up to an elevation of at least 4,000 feet, and are quite evidently holding their own.

plant successfully to their garden, and they have the necessary sustained interest to keep it alive, they could so easily have taken it from neighbouring forest or roadside, and have left the plants in Templer Park alone for the enjoyment of other visitors.

The Friends of Templer Park Society, of which the Malayan Nature Society is a founder member, is the only voluntary body in Malaya devoted solely to the cause of conservation. The work it is doing is related to that of the old-established Friends of the Lake District in Britain, a society that has played so large a part in preserving that beautiful area from mining, overhead electric cables, ugly buildings, erosion, pollution, and all the same threats that constantly menace Templer Park. The Friends of Templer Park even anticipated the British "Conservation Corps", by persuading youth clubs to send volunteers to clear river beds, cut steps, and repair bridges. The Park comes under the portfolio of the Ministry of Rural Development, which has recognised the special part that the Friends of Templer Park Society plays in developing the Park, and gives many of their decisions legal force. This Ministry also pays into the Society's funds a subvention to cover the wages of a fore-man park-keeper and four labourers. The Templer Park project is rural development in the best sense; by demonstrating to the townspeople that the rural areas are not just a wilderness, but contain much of interest and beauty. It is, after all, the conservation of nature that marks rural development from merely a transporting of town to country.



THE SHWE U DAUNG, A RHINOCEROS SANCTUARY IN BURMA

By

OLIVER MILTON*

With the approval of the Survival Service Commission of the International Union for the Conservation of Nature, the author approached the Burmese authorities in January 1958 and sought permission to carry out an initial two-year study of the fauna with the intention of offering ideas and suggestions for its continued and improved preservation. One particular feature of the proposed survey was to find out, if possible, how many *Rhinoceros sondaicus* and *Didermoceros sumatrensis* still existed in the country and what steps could be taken for their future protection and prevention from extinction in Burma.

In 1955 Lee M. Talbot, an ecologist, undertook an extensive mission for the Survival Service in the Middle East and South East Asian countries to look into the status of certain endangered species. Lack of time in Burma prevented any field trips and so he gathered his information from sources in Rangoon, in particular, U Tun Yin, a retired government servant who is greatly interested in conservation. The number of rhino estimated as a result of these enquiries was between thirty-five and forty-six(1).

Estimating the population of a certain species is extremely difficult in a country such as Burma where so much of the land is covered with dense jungle. Figures produced by local inhabitants are, unfortunately, often incorrect as they are apt to overestimate the number of animals in a herd; by hazarding a guess rather than by individual counting (which, admittedly, is not always possible); through counting the same animal more than once; by incorrect interpretation of the tracks or by relying on information from other natives.

Once the Burmese Government had agreed to our Survey I was able to visit the Shwe U Daung sanctuary—as well as other areas—since this used to be a confirmed habitat of *Didermoceros sumatrensis*. I spent from 16th. July until 18th. August, 1959, in the reserve, but owing to the inclemency of the weather a future visit is necessary.

The first steps to preserve the rich fauna and flora of the Shwe U Daung were taken in 1918 when eighty-one square miles of the East Katha District were declared a Reserve. Eleven years later another forty-five square miles in the Mongmit Division were added, thus

* Burma Wild Life Survey 1958-60; now in Malaya.

bringing the total area to one hundred and twenty-six square miles. It became a reserve for the following species:—

- Barking Deer (*Muntiacus muntjak*)
- Bear (*Selanarctos thibetanus*)
- Elephant
- Gaur (*Bibos gaurus*)
- Leopard
- Pig
- Saing or Banteng (*Bibos sondaicus*)
- Sambur (*Cervus unicolor*)
- Serow (*Capricornis sumatrensis*)
- Tiger
- Two-horned Rhinoceros (*Didermoceros sumatrensis*)

Notice boards were placed along the boundary and a handful of game scouts did their best to patrol the area. During the last war the wild life suffered considerably and even until recently the area has been frequented by anti-government elements who have not only enjoyed the hunting but, at the same time, have prevented the Forest Department game officers from carrying out their duties.

The Reserve is approximately rectangular in shape—fifteen miles east-west and eight miles north-south—and divided lengthwise, both physically and ecologically, by a main ridge. There are, therefore, two distinct and almost equal sized parts, namely, the southern and the northern slopes.

The southern slope originates at the Ondan river and rises fairly steeply and uniformly to the main ridge of which the Shwe U Daung peak is the dominating feature. The lower section of the slope is covered by a consociation of bamboo (*Cephalostachyum pergracile*) which is used by the villagers of Ondan in the construction of their houses. At 2,800 feet the bamboo becomes less dense as other species, *Baccaurea sapida*, *Terminalia belerica*, *Careya arborea*, start to form a thick forest. At 4,500 feet there is an interesting first order ecotone as the forest merges into mountain meadow. Except for a few patches of mountain forest this grassland, dominated by *Imperata* sp., extends to the highest points along the ridge.

Above 4,000 feet the slope is not only completely exposed to the full force of the south-west monsoon but also in sight of the hot plains of Central Burma near Mandalay. Violent winds, sweeping up the slope and assisted by driving rain and mist, cause remarkable stunting of many trees, especially *Quercus* sp., and a distinct northerly inclination of the

branches. Numerous streams have their sources in this grassland and, rising from crystal clear springs, the water flows over limestone boulders and through the thick forest to the Ondan river.

The northern slopes of the range are quite different. Except for a small area of grassland the ground is covered with thick climax forest unaffected by the growth-inhibiting wind and sheltered from the monsoon. It can be described as Burma sub-tropical, wet hill forest and is typified by *Quercus*, *Castanopsis*, *Lauraceae* and *Meliaceae* with woody climbers, root climbers (*Ficus* spp.) and epiphytes.

At the foot there is no bamboo climax as found on the south side. Edaphic and climatic conditions cause a sudden change. The laterite soil, high diurnal temperatures and comparatively low annual rainfall (about 45 inches) result in Indaing forest (or dry dipterocarp forest) which is attractive to very few animals of the hill forests.

Our first camp was at 4,700 feet in the grassland on the south slopes and I doubt if the weather could have been more unpleasant. Except between four o'clock in the afternoon and ten at night there was thick driving mist and rain. The minimum temperature was 60°F., mildew formed on all our personal belongings and scarcity of good firewood made cooking very difficult. The thick mist reduced visibility to a score of feet and we were often unable to leave the camp for fear of getting lost in the grassland. I purposely chose these two worst months of the year as reports said that rhino like to congregate at certain wallows during the full moon of July.

Our second camp was on the north side where we sheltered under a huge overhanging rock. Although it rained almost continuously the surrounding forest kept us fairly dry. Owing to the configuration of the country the four main streams that rise in the northern slopes have numerous small tributaries, although many of them, even during the height of the monsoon, only flow after an exceptionally heavy shower. Those that are annual have their sources at springs of varying sizes and it was there that we found wallows. Some had been made by pig while others had been well churned by elephants. In one spot we found an old rhino wallow and at another puddle two indentations that might have been made by the nails of a rhino's foot. We found two sets of tracks and some dung which might have been two or three days' old. The continual rain and damp forest floor made it very hard to find, follow and identify tracks.

During our stay we sampled more than half the Reserve and came to the conclusion that there are two rhino still living but are naturally unable to say whether there are more. There might be. However, no

matter how many there are it is fairly certain that they are confined to the upper reaches of the streams as this is the remotest part of the Reserve. The western part has been visited by political insurgents and the eastern section is over-run by villagers during June and July when they collect certain jungle fruits.

Food to which the rhino is particularly partial, *Toddalia aculeata* and *Calamus* sp., grows abundantly at the sources of the four main streams and so it is here, in an area of about twenty-five square miles, that one will probably find the rhino population.

By questioning local villagers I learnt that seventeen rhino had been killed since about 1940, one man accounting for ten of them!! There seems to have been little hunting since 1956 owing to insurgents and recently the Government withdrew all privately owned arms and ammunition.

The values attached to various parts of the rhino are as follows:--

Dried blood	...	US\$2 per oz.
Fresh blood	...	US\$30 per lb.
Bone	...	US\$3 per lb.
Skin	...	US\$6 per lb.

and the horn varies from US\$105 to 210 PER INCH!!

It is doubtful whether the population can ever be determined precisely but it seems reasonable to believe that there might be between twenty and thirty *Didermoceros sumatrensis* and one or two *Rhinoceros sondaicus* still left in Burma.

Reference

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UDJUNG-KULON NATURE PARK, JAVA*

By

R. KOESNADI P. SATMOKO†

General Description

Udjung-Kulon is a peninsula at the most south-western part of Java, and with the small nearby islands covers an area of 41,120 hectares. It has long been famous for its wild life, and is the last remaining stronghold of the Javan or One-horned Rhinoceros (*Rhinoceros sondaicus*), one of the rarest mammals in the world today. It consists mainly of an obtuse conical mountain called Gunung Pajung, which means 'umbrella mountain', a name probably given to it because of the radiating ridges which resemble the frame of an umbrella.

The land is of mixed volcanic and sedimentary origin. The soil composition varies from the coral sands and limestones of the coast to tuff, tufa, marl sandstones, breccias, conglomerates and layered rock-formations on the higher areas, the ridges and mountain.

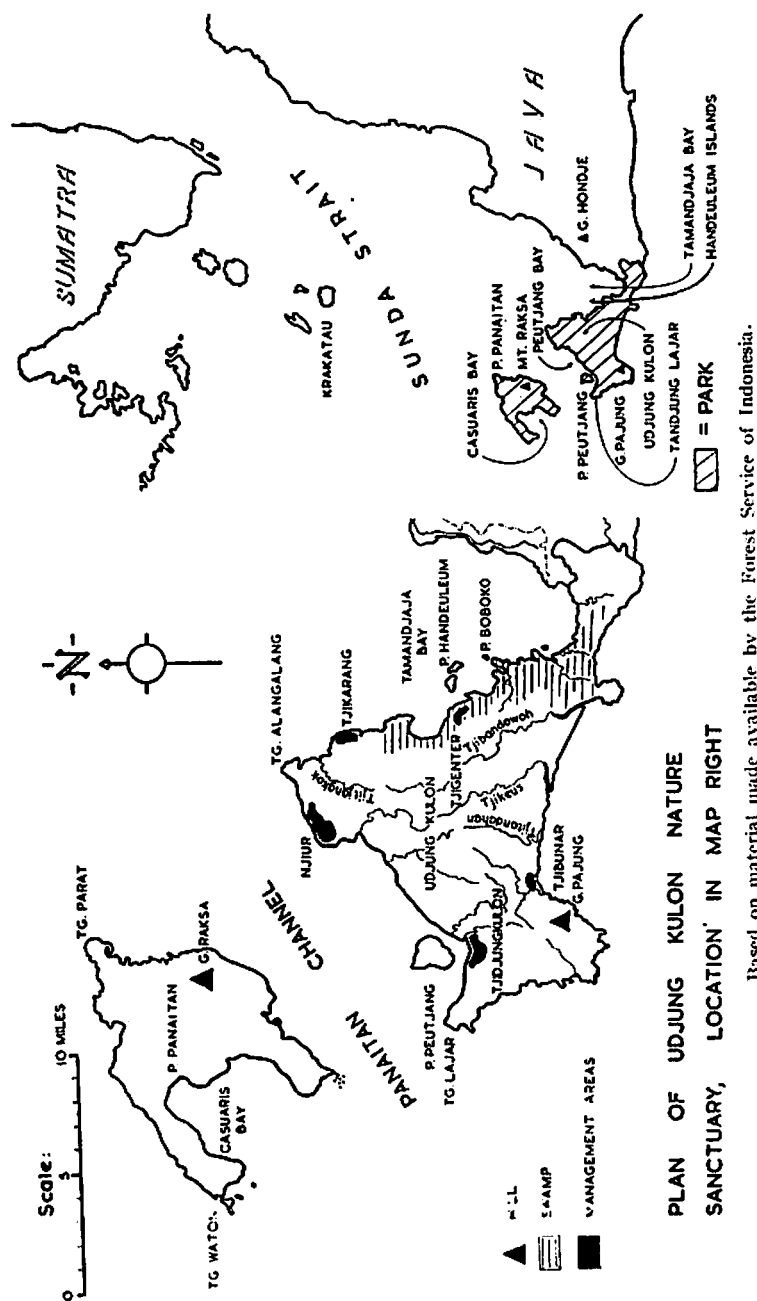
The southern and western sides of the mountain are walled by precipitous volcanic cliffs, from fifty to seventy metres high, which rise sharply from the sea. In several places the Grey-rumped Swiftlets (*Collocalia francica*) build their edible nests in the clefts and caves.

The eastern part of the peninsula is a low, gently rolling plateau some fifty metres high, whereas the western side is bordered by a row of hills which rise to about one hundred and forty metres.

The whole peninsula is covered with luxuriant forest and is uninhabited. Formerly there was a village called Djung-Kulon on the mainland opposite Peutjang Island, but in 1883 it was flooded by the tidal wave formed as a result of the eruption of Krakatau in the Sunda Strait. This wave swept away the entire village, together with the vast island-forest and morass-forest at the neck of Udjung-Kulon. All the present forests on the flat shore and on the islands have developed since that time.

* This is a comprehensive account of probably the longest established, the most studied and best developed Nature Park in the region. It is also one of the most interesting, being the last stronghold of the Javan or One-horned Rhinoceros, one of the last areas in Java with original lowland forest and yet at the same time containing around the coast and on the islands juvenile forest which has evolved since the destruction caused by the eruption of Krakatau in 1883. Ed.

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PLAN OF UDJUNG KULON NATURE
SANCTUARY, LOCATION IN MAP RIGHT

Based on material made available by the Forest Service of Indonesia.

Udjung-Kulon includes woodand, grassland, rocks, islands, dunes, rivers, lakelets and marshes, all mixed together and overlapping in an ever-changing pattern.

The forest begins close to the rocky coast in the mountainous southwest and is characterised by the presence of a large number of palms in the understorey (see Table 1, a). Further inland in the mountain and foothill areas the trees are taller, especially those of *Planchonia valida* which rise far above the surrounding vegetation, and a feature is the tangled mass of rattans, e.g. *Plectocomia elongata* (bubuway), and lianes (see Table 1, b and c). To the east again are thousands of hectares of lowland forest in which are found not only most of the species usually found in the west Javan jungle of the same elevation (see Table 1, d) but also species, such as members of the important south-east Asian family of trees, the Dipterocarpaceae, which are almost extinct elsewhere in Java. In this forest are dense clumps of the half-herbaceous marantaceous plant *Donax arundastrum*, the bamboo *Schizostachyum zollingeri* and gingers.

The southern coast is sandy for the greater part with extensive flat sandstone rocks at intervals. Strong winds blow almost continuously on this coast, night and day, giving rise to dunes and lagoons. The vegetation is grassland with bush-like screw-pines (*Pandanus* spp.) and the occasional giant *Pandanus bidur* some eight to twenty metres high, whereas the dunes are covered by the typical and usual association of *Ipomoea pes-caprae*, *Spinifex littoreus*, and *Vigna marina* (see Table 1, e).

In contrast to the wild southern coast the sea along the shore of the Peutjang Bay on the west coast is calm. Small rocks protrude from the water-surface at intervals and these are occasionally used by terns as breeding places. The shore vegetation is typical, the most common species being *Barringtonia speciosa*, *Calophyllum inophyllum*, *Cordia subcordata*, *Crinum asiaticum*, *Desmodium umbellatum*, *Hibiscus tiliaceus*, *Terminalia catappa* and *Vitex negundo* (see Table 1, f).

In the neck of the peninsula the low slopes, stretching eastwards, are varied by partially swampy valleys and small streams. The vegetation is generally no more than ten to twenty metres in height and consists of well spaced trees amongst a dense shrubbery of woody plants, bamboos, palms and rattans. Mangrove forest occurs along this coast.

Striking features are the abundant trees of *Buchanania arborescens* on the young coral islands of Handeuleum, the thick clusters of *Casuarina equisetifolia* at Djamang, the dominating palm *Corypha*

gebanga on the grassy terrain of Tjekarang, the clumps of *Guettarda speciosa* along the banks at Tjitelang, the densely-crowned trees of *Ardisia humilis* in the Tembing game-pasture area and the prevalence of *Lagerstroemia speciosa* on the parklike grassland of Tjigenter.

As much as 3,500 millimetres of rain falls on the average each year. The streams flow rapidly and where their outlet to the sea is barred by a broad impervious coral wall, small brackish lakes are formed around which zones of *Ardisia humilis* and rushes and sedges occur. Examples of these are found in the vicinity of the Njiur and Tjekarang game feeding-grounds. Some of the water-courses rise and flow through tufaceous soil and limestone resulting in precipitated terraces of travertine such as can be seen along the upper reaches of the Tjigenter river. Along these upper courses are found many beautiful butterflies, dragonflies and midges. The lower reaches teem with a variety of fish (see Table 2, a and b). Nipah-palms (*Nipa fruticans*) fringe the broad, brackish water streams of the estuary.

The principal islands off the coast of the peninsula are Panaitan Island (or Prince Island), Peutjang Island (or Seagull Island) and the Handeuleum group of islands and islets.

Panaitan Island is in the Sunda Strait about ten kilometres north-west of Tandjung Lajar, and is the farthest west of any of the islands. It is about 12,000 hectares in area. The U-shaped extended arms of the deeply-indented Casuaris Bay, which faces south-westwards, were at one time the walls of a crater-cone, the bay itself being the cavity of the volcano. In the north the predominating vegetation is mangrove and the *Barringtonia* shore formation (see Table 2, f). There is also in the drier areas a lightly wooded parkland or savannah of *Ardisia* trees and the grasses *Imperata cylindrica* and *Saccharum spontaneum* with scattered large trees of *Sarcocephalus* sp. In the wetter parts Cyperaceae dominate. Elsewhere the island is under high forest with patches of deciduous trees such as *Pongamia pinnata*, *Guettarda speciosa*, *Spondias pinnata* and *Sterculia urceolata*. The latter grow to very large trees and their exceptionally high buttresses are particularly striking. The highest point is Mount Raksa, 319 metres. There are two Hindu statues on its summit representing Siva and Ganesha. Off the east coast of the island are rows of beautiful marine gardens which are clearly visible through the blue water. Some of the principal fauna are listed in Table 2, c. The sheltered waters of Lentah, Semadang and Peutjang Bays in the Panaitan Channel are also extremely rich in marine life (see Table 2, d).

Panaitan Channel, the ocean south of Ujung-Kulon and Panaitan Island offer good opportunities for deep-sea gamefishing. By means of trolling Spotted Spanish Mackerel (*Indocybium guttatum*), Trevally (*Gnathodon speciosus*), Dart (*Trachinotus bailloni*), Barred Spanish Mackerel (*Cybius commersoni*), Tuna (*Kishinoella tonggol*), Mackerel Tuna (*Euthynnus affinis*) and Barracudas (*Sphyraena* spp.) may be taken on line and hook using artificial bait. The best fishing season appears to be from July to October during the dry monsoon. Other fish found in these waters are included in Table 2, e.

Peutjang Island is about 450 hectares in area, almost flat and only some 500 metres from the mainland. It is covered with a very open type of forest rich in *Intsia bijuga*. The Javan Deer is found on the island and this population is said to be a distinct sub-species.

The Handeuleum group of coral islands is situated in the Bay of Tamandjaja in the east. The group comprises two main islands, Handeuleum I and II of a total area of 70 hectares, five outliers and a number of rocky islets. The two main islands are covered with a juvenile forest in which some of the most common species are *Buchanania arborescens*, *Neonauclea calycina*, *Pemphis acidula*, *Pongamia pinnata*, *Rademachara gigantea*, *Hibiscus tiliaceus*, *Ardisia humilis*, *Piper aduncum* and *Lantana camara*. The sea around these islands is muddy and the waters are not as rich in fishes as those around Peutjang Island.

History of the Park

In 1921 the peninsula of Ujung-Kulon was declared a Nature Monument ("Strict Nature Reserve") and administered by the Department of Internal Affairs. The aim was to protect the flora and fauna, and to retain them in their natural condition, fundamentally for scientific purposes. The genesis of this protection movement was idealistic in the highest sense. An exceptional streak of this idealism amid an age of ruthless raiding led the first group of scientists, aesthetes and conservationists viewing Ujung-Kulon, to decide that the best use of this area would be non-productive in the strictly practical sense.

In accordance with the clause on Nature Monuments and Game Reserves Ordinance of 1932, Ujung-Kulon Nature Reserve was to be kept untouched in all its natural setting. As a result, all the existing grasslands were gradually overgrown with secondary forest. The response of wild life to the rapidly changing ecological conditions was unfortunately not gratifying. Herbivores — in particular the plain dwelling and grass-eating species — did not fare well. The balance of nature had in some way become abnormal for the large numbers of wild animals living there. The stock of game began to dwindle alarmingly.

The fault lay in the original principle, but it was not until sixteen years later that Ujung-Kulon became a Game Reserve or Nature Park instead of the old, restricted, closed type of reserve.

By Government decree on June 24, 1937, No. 17 (Govt. Gazette No. 420) the islands of Panaitan, Peutjang and the Handeuleum group were included in this newly constituted Ujung-Kulon Nature Park, which was further enlarged by the addition of a vast portion of the adjacent Hondje-mountain Forest Reserve. Simultaneously this Park was proclaimed a forest sanctuary and a prohibited area. This measure was a vast improvement on the former status. From thenceforth the administrative control of this area was taken over by the Forest Service. Since then, the necessary management for improving the habitat for wild life, and the maintenance and development of this Park as a game refuge was put into effect.

However, very little was done towards the maintenance of this Park during the Japanese occupation and on the outbreak of the war of independence in Indonesia (1945-1950) Ujung-Kulon was abandoned. What was not already destroyed was left to the mercies of the jungle which rapidly obliterated all the work of previous years. Even the grasslands gradually disappeared under secondary growth. During this period a certain amount of poaching took place in the Park. Some thirteen rhinoceros were killed and many wild-oxen, deer and other animals were ruthlessly slaughtered.

In 1950, shortly after the transfer of sovereignty to the Government of the Republic of Indonesia, the newly established "Wildlife Management and Nature Protection Bureau" of the Forest Service took over the affairs of the Park. Most of the former staff were summoned for duty to reorganize this reserve. Labourers were recruited from the neighbouring villages of Tjipining, Tamandajaja, Tjikawung and Tjegog. Recruitment has always been from these villages, as these descendants of generations of jungle-dwellers and seamen are in their natural element in these remote, rough regions. Funds were made available and in September, 1951, a start was made on the erection of buildings and patrol bivouacs of local pattern, the clearing of secondary growth to maintain game-pasture, the reopening of the patrol paths, and the policing and managing of the Park.

Meanwhile, proceedings were taken against poachers. The wrongdoers were charged with the shooting of the strictly protected rhinoceros and of being in a prohibited area, and were fined Rp. 150. This punishment was farcically low, since these poachers had sold the horns of illegally killed rhinos for Rp. 8,000 each, and dried skin for Rp. 180

or more per kilogram. Previously those who were charged with such an offence had to pay a severe penalty; in one case an offender was given two years' imprisonment.

In order to deal with poaching, a bounty and monetary system has now been instituted. In addition to the scheduled guard-duties in the Park, directions have also been issued to armed game- and forest-rangers policing the adjacent forest area (i.e. the Hondje-mountain forest sanctuary which is declared an intermediate zone of Ujung-Kulon) to prevent hunting and other irregularities that may occur. It is hoped that these extra protective measures will act as a salutary example and that the widespread abuses of the past will abate. Up to the time of writing, the result of this extra severe control has been most encouraging. Poaching has not occurred since and there are now far more rhinoceros than formerly.

Further improvements are being made as money and labour become available. All the original temporary structures have been replaced gradually. There is now better accommodation, viz. permanent buildings, camouflaged observation-towers or look-out cabins, staff quarters, and a fleet consisting of Diesel-engined launches, a 4-ton bark, catamarans (twin-hulled sailing boats), flat-bottomed utility skiffs, canoes, and many other small local boats.

The equipment is better than before the war and progress is being made steadily. According to the present need, this Park has a permanent staff of 41 employees — including a captain or game-warden, 2 assistants, 5 rangers, park keepers, guards and crew of the vessels —, and some 100 seasonal labourers.

The broad plan is to develop this Nature Park for visitors whose interest lies in studying natural history or observing and photographing wild life in attractive surroundings. Accommodation is being arranged, and the facilities provided are aimed at reasonable comfort without losing sight of the object of the Park. They infringe upon the demesne of the spirit of the jungle as little as is humanly possible. In any case, all things must be kept simple and the first objective is to provide a natural environment. In the first case, nature conservation will be the paramount aim. The aggregate area required to meet the recreational and tourist needs will not cover more than approximately three per cent. of the total area. It should not conflict, therefore, with essential requirements for the survival and multiplication of wild life.

Although plans are still incomplete it is possible to handle small parties of visitors — the best months are from August to October — and the work of development is making steady progress. Erection of two-

storied rest houses on the Peutjang and Handeuleum islands will be finished this year, as will the building of observation cabins at the game-pastures of Tjidjungkulon and Tjibunar which will give overnight accommodation for visitors.

The annual recurrent expenditure for the development and maintenance of feeding-grounds throughout the Park is about Rp. 100,000. Before the war liver fluke disease had for long been endemic in the stagnant wet pastures of Udjung-Kulon, never a year passing without this disease appearing, although it was not usually fatal. By manipulating the habitat to give better nourishment to the ungulates, and by draining stagnant wet feeding-grounds to eliminate the existence of the snail (*Limnacus minutus*) the intermediate host of fluke, and by applying copper sulphate to pools and water sources to combat cercaria, cysts and sporocysts of the fluke (*Distomum hepaticum*), etc., it is hoped that these diseases will soon be well under control.

Animals in Udjung-Kulon suffered rather heavily during the time of the Japanese occupation and the Revolution. During the first reconnaissance expedition by Mr. A. Hoogerwerf (Head of the Nature Preservation Division, Botanical Garden) and the author shortly after the assignation of sovereignty, there was very little evidence of the once-abundant wild life. Besides the heavy poaching, the feeding-grounds were overgrown with heavy cover of bush and thicket.

Game has, however, responded fairly well to the protection measures applied. Apparently through management the habitat has become more favourable for wild life and this has led to a considerable increase in the ungulates and other wild animals. In restoring game feeding-grounds special ecological studies are being carried out throughout the park and its intermediate zone. An experiment in creating cover and interspersing (i.e. intermingling of two necessary habitat factors food and cover) is in progress. The policy of maintaining a sane relationship between number of game and their food supply should produce the desired effect. In this respect Nature must be aided by man.

The amount of game seen now and its tameness is quite remarkable. Game in this Park, including the rhinoceros, are increasing.

Javan Rhinoceros (*Rhinoceros sondaicus*). There are now about fifty Javan Rhinoceros in Udjung-Kulon, the last individuals in Java. Last year some five calves were observed. In the adjacent intermediate zone there are another three individuals which usually restrict their range to the vicinity of Aer-Mokla forest. This huge, ungainly creature with its armoured hide, massive legs, odd-looking head, and horned nose is fairly safe from extinction in this last refuge. Every



Botanical Garden, Bogor, R.I.
Male Javan Rhinoceros wallowing in the Udjung-Kulon Nature Park.



Wildlife Management and Nature Protection Division,
Forest Service, Indonesia.
Banteng in the parklike grassland at Tjigenter.



Botanical Garden, Bogor, R.I.
Banteng at the Djamang water hole, Ujung-Kulon.

possible measure is being taken to safeguard it, because this animal is threatened with extinction due to the widespread, mistaken belief throughout the East in the medicinal and aphrodisiac properties of its horn and hide. There is reason to believe that there are still a regrettably large number of persons whose one idea of earning big money is to kill rhinoceros. Therefore, all-the-year-round guardians are considered doubly important and are maintained both inside and outside the Park.

Banteng (*Bibos sondaicus*, syn. *Bibos banting*). The Banteng were originally found over a considerable part of the grassy north- and south-coast of the peninsula, but owing to the disappearance as described earlier of most of these feeding-grounds in the past, over half of the original number have wandered outside the Park into the Hondje-mountain intermediate zone. Last year's census reported more than three hundred individuals in the Park, and approximately three hundred and fifty in the forest sanctuary outside. This wild ox appears to become more numerous every year, and it is now found in bands of thirty to fifty head or even more, on the reopened pastures.

Deer. In Ujung-Kulon deer are represented by the Barking Deer (*Muntiacus muntjac*), the Mouse Deer or Kanchil (*Tragulus javanicus*), the Javan Deer (*Cervus hippelaphus*) and the doubtful new sub-species of Peutjang Island, *C. h. laronesiotes*.

Any reference to this sub-species must necessarily be preceded by a brief historical sequence of some remarkable changes in the conditions on the island. It is thought that this species, of which there is an apparently stationary herd of some fifty to sixty animals, arose from *Cervus hippelaphus*, the common Javan plain-dwelling deer, which had for some reason swum across the channel from the mainland to Peutjang Island. After the eruption of Krakatau, the primary vegetative covering was presumably grass, thus forming plentiful food resources for these migrated animals. In all probability the number of deer were too small to influence the vegetation and all these feeding-grounds were gradually overgrown by dense bushes and trees, so that the grass-eating deer had ultimately to rely entirely upon leaves of the understorey-vegetation for food. This gradual change of food, generation after generation, and the lack of beasts of prey caused a change in their physical constitution and resulted in a variation in their heritable character.

It was earlier believed that the Peutjang deer was merely the same race as Javan deer, as considerable variation in the pattern is apparent. But the mainland species is exclusively a grass-eating and plains-

dwelling animal which cannot live in forest conditions, whereas the species of Peutjang Island is a real forest deer. The latter is much smaller, long haired, lighter in colour and apparently cannot swim.

It is still an open question if the deer found on Panaitan Island until World War II was also a separate biotype. Apart from the loss of this species, the subsequent response of deer to the protection measures has been most gratifying. More deer in herds of from twenty to sixty individuals were seen during 1960 than was anticipated, a number larger than before the war; and in general their physical condition was good. However, the deer of Tjigenter parkland appear to be slightly infected with the nasal bot fluke, the normal scourge of deer. It would appear that the vegetation and ecological conditions of this relatively restricted and enclosed parkland, which is covered with a short mat of *Andropogon aciculatus* and is heavily overgrazed by the existing couple of dozen deer and three dozen Banteng, are not exactly favourable for producing the quantities of herbivorous insects necessary to attract birds such as the Javan Jungle Myna (*Aethiopsar grandis*) and the Slender-billed Crow (*Corvus enca*). These are very important in eliminating bot-fly (*Oestrus* spp.) infection.

Barking Deer or Muntjac are found at all elevations, but they are seldom seen owing to their skulking habits and love of thick undergrowth.

The Kanchil or Chevrotain is almost completely nocturnal. They are more numerous than is generally considered and are found over most of the peninsula and islands.

Water Buffalo (*Bubalus bubalis*). These animals are confined mainly to the south-east of the peninsula. They are, in reality, feral domesticated animals. It is thought that these animals may be a nuisance to the endemic animals by harbouring and transmitting cattle-disease. Special attention is, therefore, being paid to control these animals.

Wild pigs are abundant. The common species is *Sus vittatus*.

Tiger (*Panthera tigris*) and Panther (*Panthera pardus*). These animals are mostly restricted to the palm and *Pandanus* wilderness of the southern regions, and are seldom seen during the day. The tiger, the most feared of all our fauna, has disappeared almost completely from the forests of Java, and is safe from extinction only in the game reserves. The estimated number of tiger and panther in Ujung-Kulon is only fifteen; they do not occur on the islands. One of the chief aims of

conservation is to retain these splendid beasts of prey unimpaired in Ujung-Kulon where they do not harm but actually assist in the balance of nature.

Another member of the cat family found in this Park is the Leopard Cat (*Felis bengalensis*).

Wild Dog (*Cuon javanicus*). These animals are more in evidence recently. The question now arises of maintaining a satisfactory balance between these wild dogs and the ungulates on which they prey. This is all the more important if, as may be the case, the sanctuary conditions in the Park in fact reflect a change in the normal balance.

Other animals present are the Javan Mongoose (*Herpestes javanicus*), the Palm Civet (*Paradoxurus hermaphroditus*), the Little Civet (*Viverricula malaccensis rasse*), the Smooth Otter (*Lutra perspicillata*), the common Hairy-nosed Otter (*Lutra sumatrana*), and the Small-clawed Otter (*Amblyonyx cinerea*).

Of the primates the Grey Gibbon (*Hylobates moloch*, syn. *H. leuciscus*) occurs mostly in the mountainous regions. Also present and more numerous are the Long-tailed Macaque (*Macaca irus*) and the Silvered Leaf Monkey (*Trachypithecus pyrrhus*).

Gnawing mammals include the Pallid Giant Squirrel (*Ratufa bicolor*), the Plantain Squirrel (*Callosciurus notatus*), the Flying Squirrel (*Pteromys nitidus*), meadow mice and rats. Also present are the Flying Lemur (*Cynocephalus variegatus*) and Tree-Shrews (*Tupaia* spp.).

Bats. Flying Foxes (*Pteropus vampyrus*) can be seen at twilight and also many kinds of bats; Short-nosed Fruit Bats (*Cynopterus* spp.), Flat-headed or Club-footed Bats (*Tylonycteris* spp.), and False Vampires (*Megaderma* spp.).

Reptiles. The common reptiles include the Estuarine Crocodile (*Crocodylus porosus*), Common Water Monitor (*Varanus salvator*), Reticulated Python (*Python reticulatus*), vipers, adders and lizards.

Birds. Bird life is very well represented as can be seen from Table 3. The Green Peafowl is not uncommon along the north coast, particularly in the Tjidjungkulon-Tjidaun, Tjikarang and Tjigenter game pastures, but they are rarer further south. Bee-eaters are numerous everywhere and many species of songbirds are both heard and seen on the islands and in the vicinity of the game feeding-grounds. Hornbills with their noisy wing-beats are often spotted in flight or their sonorous vocal cry heard across the country-side. The cliffs along the south-west and west coast, which are almost bare of vegetation, are

packed with terns during the nesting season. The Long-tailed Nightjar inhabits the dune areas of the south coast. Herons, storks, the Indian Darter and Little Cormorant breed at Njiur and Tjitjangkok.

Places of Interest

There are numerous recreational activities in which the visitor may participate; observing wild life, sight-seeing, boating, fishing and so on. Vessels and paths afford many vantage points from which one may enjoy the magnificence of the enormous cliffs and reefs of Tandjung Lajar, the First Point of Java. Other paths lead to important points of interest, such as the Tjigenter, Tjikarang, Tjitjangkok, Djamang, Njiur, Njawan, and Tjidjungkulon-Tjidaun game concentration areas, all of which are located near the shore.

Njiur and Tjitjangkok are centres for breeding herons and storks. The game feeding-grounds of the former are vast plains of grassland with flood-plain and saline lake-shore species of plants represented. The dry places are overgrown with *Imperata cylindrica* grass and tussocks of *Panicum repens* and *Andropogon* sp. The wet plains are profusely covered with *Polygonum longisetum*, *Cyperus* spp. and *Fimbristylis annua*. This grassland is fringed with *Ardisia*, *Neonauclea*, *Hibiscus*, *Glochidion*, *Terminalia* and other trees. These feeding-grounds are occupied by a fairly large stock of deer and about two dozen Bantengs besides many lesser mammals. In about the middle of the trough the drainage culminates in shallow lakelets, moulding a life zone for such birds as the Lesser Adjutant Stork, Milky Stork, White-necked Stork, Grey Heron, Grey Teal, Indian Whistling Duck and Lesser Whistling Duck. It is possible to see the scene at the tops of the trees where the adult Large and Little Egrets, Javanese Pond Herons, Rufous Night Herons, Indian Darters and Little Cormorants are nesting and feeding their chicks.

The feeding-ground of Tjikarang grassland is subject to flooding. In general it may be classed as meagre and infected. However, the scenery itself is very attractive with the occurrence of large clumps of *Corypha* palms. In an afternoon visit in the dry season one is sure to see a variety of game, Bantengs, deer, junglefowl and, most interesting of all, dozens of peafowl lingering about the open palm. Even tiger can be observed at times.

Tjigenter is one of the most attractive game concentration points and the most parklike grassland found in Ujung-Kulon. It is not far away from the camping site of Handeuleum Island. A fair-sized look-out cabin has been completed near Tjigenter-river to enable the

spectators to observe wild life at their convenience. If visitors decide to go up the river by canoe at evening they might meet an odd rhinoceros on the way.

From a faunal point of view, the feeding-grounds of Tjidjungkulon-Tjidaun are the best in the Park. These pastures — situated just opposite Peutjang Island — are particularly favourable to a large game population due to the palms and grassland with interspersed thickets and grassy glades, and the fresh water river the Tjidaun. The grasslands are covered with good species of grass such as *Andropogon aciculatus*, *Ischaemum muticum*, *Isachne miliacea* and *Panicum colonum*. Small tussocks of *Cyperus* spp. and *Fimbristylis* spp. occur on the wet places. Cover vegetation of *Melastoma malabathricum* fringes the edges of these pastures. Foot-marks of rhinoceros can regularly be seen deeply printed in the sand of the broad beach of Tjidjungkulon.

The game-pastures lie on the northern side of the mainland and the prevailing wind is south-easterly during the dry season, so that there is no danger of spectators being given away by scent. Banteng and deer may come down to feed at any time during the day, but the best is generally from about four o'clock in the afternoon.

When considering wild life in Indonesia the heavily wooded character of the country must be borne in mind. Other than some game reserves in east Java, it is only in Ujung-Kulon that the association of the fauna with the artificially made habitats is so far advanced that it is possible to see wild life in such concentrations. The true woodland fauna, however, has always been dispersed and less easily seen.

Table 1. A list of some of the commoner plants growing in the Park.

Locality	Vernacular Name	Scientific Name
(a) Palms in understorey of jungle close to rocky coast in mountainous south-west	Langkap Suwangkung Nibung Wergu Satak	<i>Arenga obtusifolia</i> <i>Caryota furfuracea</i> <i>Oncosperma filamentosa</i> <i>Rhapis flabelliformis</i> <i>Zalacca edulis</i>
(b) Trees of mountain and foothill areas of the west	Dangdeur leuweung Peundeuj Putat Tjerlang Kadungdung leuweung	<i>Gossampinus vuletonii</i> <i>Parkia biglobosa</i> <i>Planchonia validu</i> <i>Pterospermum diversifolium</i> <i>Spondias pinnata</i>
(c) Common epiphytes on trees of mountains and foothills	Paku pandan Anggrek bawang Anggrek bulan	<i>Asplenium nidus</i> <i>Dendrobium crumenatum</i> <i>Phalaenopsis amabilis</i>
(d) Trees of lowland forest in the interior	Djengdjen Lame Handjah Teureup	<i>Albizia lebbeckioides</i> <i>Alstonia scholaris</i> <i>Anthocephalus cadamba</i> <i>Artocarpus elasticus</i>

Tjalingtjing	<i>Averrhoa bilimbi</i>
Gadok	<i>Bischofia javanica</i>
Purut	<i>Calophyllum javanicum</i>
Kananga	<i>Cananga odorata</i>
Kadungdung	<i>Canarium decumanum</i>
Kanari babi	<i>Canarium indicum</i>
Haringin	<i>Cassia timoriensis</i>
Haremeng	<i>Cratogeomys racemosum</i>
Kikandih	<i>Crypteronia paniculata</i>
Segel	<i>Dillenia excelsa</i>
Kitjadung	<i>Diospyros macrophylla</i>
Dadap belendung	<i>Erythrina variegata</i>
Salam	<i>Eugenia polyantha</i>
Kiara	<i>Ficus retusa</i>
Leles	<i>Ficus variegata</i>
Manggu leuweung	<i>Garcinia celebica</i>
Tjeuri	<i>Garcinia dioica</i>
Tangkil	<i>Gnetum gnemon</i>
	<i>G. latifolium</i>
Merbau	<i>Intsia bijuga</i>
Bungur	<i>Lagerstroemia speciosa</i>
Gempol	<i>Nauclera orientalis</i>
Taritih	<i>Parinari corymbosa</i>
Soge	<i>Peltophorum pterocarpus</i>
Sigeung	<i>Pentace polyantha</i>
Kibima	<i>Podocarpus blumei</i>
Leungsir	<i>Pometia pinnata</i>
	<i>Pouteria obovata</i>
Kisereh	<i>Sapium virgatum</i>
Burahol	<i>Stelechocarpus burahol</i>
Kikatjang	<i>Strombosia javanica</i>
Bantjet	<i>Turpinia pomifera</i>
Laban	<i>Vitex pubescens</i>
(c) Vegetation of dunes	
Widuri	<i>Calotropis gigantea</i>
Daun katang	<i>Ipomoea pes-caprae</i>
Pulus	<i>Laportea</i> sp.
	<i>Pouteria obovata</i>
Kaju gabus	<i>Scaevola frutescens</i>
Gelang pasir	<i>Sesuvium portulacastrum</i>
Djukut tiara	<i>Spinifex littoreus</i>
Babakoan	<i>Tournefortia argentea</i>
Tjang laut	<i>Vigna marina</i>
(f) Shore vegetation of Peutjang Bay and sheltered west coast (Barringtonia formation)	
Kihiang	<i>Albizia procera</i>
Kiambon	<i>Albizia retusa</i>
Butun	<i>Barringtonia speciosa</i>
Bintaro	<i>Cerbera manghas</i>
Paku hadji	<i>Cycas rumphii</i>
Sempur	<i>Dillenia aurea</i>
Dadap belendung	<i>Erythrina variegata</i>
Kopo	<i>Eugenia subglauca</i>
Wareng	<i>Gmelina asiatica</i>
Bengkak	<i>Hernandia sonora</i>
Merbau	<i>Intsia bijuga</i>
Tjangjaratan	<i>Neonauclera calycina</i>
Deruwak	<i>Microcos tomentosa</i>
Pandan	<i>Pandanus tectarius</i>
Tjentigi	<i>Pemphis acidula</i>
Kipahang	<i>Pongamia pinnata</i>
Pedali	<i>Radermachera gigantea</i>
Pidada	<i>Sonneratia caseolaris</i>
Kiali	<i>Sophora tomentosa</i>
Babakoan	<i>Tournefortia argentea</i>
Kibahu	<i>Wedelia biflora</i>

(g) Rare species, mainly trees; some are almost extinct	Kikalapa	<i>Ailanthus malabaricus</i>
	Medang	<i>Abarema montana</i>
		<i>Beilschmiedia gemniflora</i>
		<i>Beilschmiedia undulata</i>
		<i>Beilschmiedia reylanica</i>
	Dangdeur	<i>Bombax valetonii</i>
	Degel	<i>Crudia bantamensis</i>
	Palahlar	<i>Dipterocarpus trinervis</i>
	Kaju mutoh	<i>Erythroxylum cuneatum</i>
	Tjerlang laut	<i>Firmiana malayana</i>
		<i>Heritiera percoriacea</i>
		<i>Limonia dubia</i>
		<i>Neesia altissima</i>
	Bidur	<i>Pandanus bidur</i>
	Ipil	<i>Parinari sumatrana</i>
		<i>Pterygota horsfieldii</i>
	Lame	<i>Rauwolfia sumatrana</i>
	Kidamar	<i>Vatica bantamensis</i>
	Kibajawak	<i>Vavaea bantamensis</i>

Table 2. A list of some of the inhabitants of the waters about the Peninsula.

Locality	Common Name	Scientific Name
(a) Lower reaches of the Tjigenter River	Freshwater eels	<i>Anguilla</i> spp.
	Catfish	<i>Clarius batrachus</i>
	Carps	<i>Osteochilus</i> spp.
	Barbs	<i>Puntius</i> spp.
	Minnnows	<i>Rasbora</i> spp.
(b) Brackish water streams of the Tjigenter estuary	Sardine	<i>Amblygaster sirm</i>
	Milkfish	<i>Chanos chanos</i>
	Sting-rays	<i>Dasyatis</i> spp.
	Giant Perch	<i>Lates calcarifer</i>
	Mullet	<i>Liza dussumieri</i>
	Tarpon	<i>Megalops cyprinoides</i>
	Eupotamous Catfish	<i>Mystus</i> sp.
	Skate	<i>Raja</i> spp.
(c) Marine gardens off east coast of Panaitan Island	Anemone Fish	<i>Amphiprion percula</i>
	Anemone	<i>Anemone demoiselle</i>
	Parrot Fish	<i>Callyodon blochii</i>
	Multi-coloured Parrot Fish	<i>Callyodon pulchellus</i>
		<i>Chaesio caeruleus</i>
		<i>C. chrysozona</i>
		<i>C. diagramma</i>
		<i>C. erythrogaster</i>
	Butterfly fishes	<i>Chelmon rostratus</i>
		<i>Pomacanthodes annularis</i>
	Brown Triple-tail	<i>Lobotes surinamensis</i>
	Grunter	<i>Pomadourys</i> spp.
(d) Sheltered waters of Panaitan Channel	Seaweeds, especially	<i>Euclima</i> spp.
		<i>Gelidiopsis</i> spp.
	Eagle Ray	<i>Aetobatus</i> sp.
	Green Sea Turtle	<i>Chelonia mydas</i>
	Sardines	<i>Clupea</i> spp.
	Porcupine-fish	<i>Diodon hystrix</i>
	Tassel Fish	<i>Eleutheronema tetradactylum</i>
	Reef-cod	<i>Epinephelus tauvina</i>
	Tiger Shark	<i>Galeocarda cuvieri</i>
	Halfbeaks	<i>Hemiramphus</i> spp.
	Sea-bass	<i>Lutjanus</i> spp.
	Devil Ray	<i>Manta</i> or <i>Mobula</i> sp.
	Boxfish	<i>Ostracion cornutus</i>

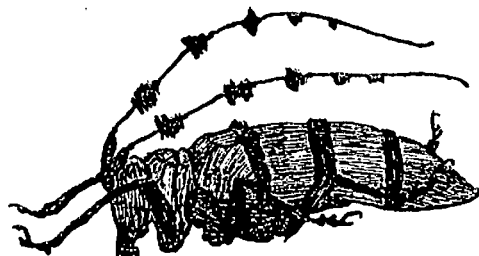
	Lobster	<i>Palaemon lar</i>
	Sawfish	<i>Pristis microdon</i>
	Guitarfish	<i>Rhynchobatus</i> sp.
	Herring	<i>Sardinella fimbriata</i>
	Hammerhead sharks	<i>Sphyrna blochii</i>
		<i>S. zygaena</i>
	Anchovies	<i>Stolephorus</i> spp.
	Scorpion-fish	<i>Synanceia horrida</i>
	Ribbon-fish	<i>Trichiurus haumela</i>
	Garfish	<i>Tylosurus melanotus</i>
(c) Open waters of Panaitan Channel	Dolphin Fish	<i>Coryphaena hippurus</i>
	Barred Spanish Mackerel	<i>Cybium commersoni</i>
	Mackerel Tuna	<i>Euthynnus affinis</i>
	Trevally	<i>Gnathodon speciosus</i>
	Sailfish	<i>Histiophorus gladius</i>
	Spotted Spanish Mackerel	<i>Indocybium guttatum</i>
	Skipjack Tuna	<i>Katsuwonus pelamis</i>
	Yellow-fin Tuna	<i>Kishinoella tonggol</i>
	Barracudas	<i>Neothunnus stosibi</i>
		<i>Sphyrna</i> spp.
	Marlin	<i>Tetrapturus brevirostris</i>
		<i>T. indicus</i>
	Dart	<i>Trachinotus bailloni</i>
	Swordfish	<i>Xiphias gladius</i>

Table 3. A list of some of the birds found in the Park.

Common Name	Scientific Name
PETRELS:	
Swinhoe's Storm Petrel	<i>Oceanodroma monorhis</i>
GANNETS AND BOOBIES:	
Brown Booby	<i>Sula leucogaster</i>
Red-footed Booby	<i>Sula sula</i>
CORMORANTS:	
Little Cormorant	<i>Phalacrocorax pygmaeus niger</i>
DARTERS:	
Indian Darter or Snake Bird	<i>Anhinga anhinga</i>
HERONS AND EGRETS:	
Grey Heron	<i>Ardea cinerea</i>
Little Green Heron	<i>Butorides striatus</i>
Large Egret	<i>Egretta alba</i>
Little Egret	<i>Egretta garzetta</i>
Reef Egret	<i>Egretta sacra</i>
Javanese Pond Heron	<i>Ardeola speciosa</i>
Rufous Night Heron	<i>Nycticorax caledonicus</i>
STORKS:	
White-necked Stork	<i>Dissoura episcopus</i>
Milky Stork	<i>Ibis cinereus</i>
Lesser Adjutant Stork	<i>Leptoptilos javanicus</i>
DUCKS:	
Grey Teal	<i>Anas gibberifrons</i>
Lesser Whistling Duck	<i>Dendrocygna arcuata</i>
Indian Whistling Duck	<i>Dendrocygna javanica</i>
HAWKS AND EAGLES:	
Black Kite	<i>Milvus migrans</i>
Brahminy Kite	<i>Haliaeetus indus intermedius</i>
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>
Grey-headed Fishing Eagle	<i>Ichthyophaga ichthyaeetus</i>
Crested Serpent Eagle	<i>Spilornis cheela</i>
Osprey	<i>Pandion haliaeetus</i>
Peregrine Falcon	<i>Falco peregrinus</i>

GAME BIRDS:	
Bustard Quail	<i>Turnix javanica</i>
Red Jungle Fowl	<i>Gallus gallus bankica</i>
Green Peafowl	<i>Pavo muticus</i>
COOTS, RAILS AND CRAKES:	
Chinese Banded Crane	<i>Porzana paykulli</i>
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>
JACANAS:	
Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>
PLOVERS:	
American Golden Plover	<i>Pluvialis dominica</i>
Grey Plover	<i>Pluvialis squatarola</i>
CURLEWS AND SANDPIPERS:	
Curlews	<i>Numenius</i> spp.
Common Sandpiper	<i>Tringa hypoleucos</i>
Redshank	<i>Tringa totanus</i>
STONE PLOVERS:	
Reef Thick-knee	<i>Esacus magnirostris</i>
TERNS AND NODDIES:	
Bridled Tern	<i>Sterna anaethetus</i>
Greater Crested Tern	<i>Sterna bergii</i>
Roseate Tern	<i>Sterna dougalli</i>
Black-naped Tern	<i>Sterna sumatrana</i>
Philippine Noddy	<i>Anous stolidus</i>
PIGEONS AND DOVES:	
Green Imperial Pigeon	<i>Ducula aenea</i>
Wedge-tailed Pigeon	<i>Sphenurus korthalsi</i>
Yellow-bellied Pintail Green Pigeon	<i>Sphenurus oxyurus</i>
Pink-necked Green Pigeon	<i>Treron vernans</i>
Bronze-winged Dove	<i>Chalcophaps indica</i>
Barred Ground Dove	<i>Geopelia striata</i>
Red Cuckoo-dove	<i>Macropygia phasianella</i>
Pink-necked Fruit Dove	<i>Ptilinopus porphyreus</i>
CUCKOOS:	
several true cuckoos	<i>Cuculus</i> spp.
Fan-tailed Cuckoo	<i>Cacomantis variolosus</i>
Koel	<i>Eudynamis scolopacea</i>
Lesser Coucal	<i>Centropus bengalensis</i>
OWLS:	
Malaysian Fish Owl	<i>Bubo ketupu</i>
Collared Scops Owl	<i>Otus bakkamoena</i>
NIGHTJARS:	
Long-tailed Nightjar	<i>Caprimulgus macrurus</i>
SWIFTS:	
House Swift	<i>Apus affinis</i>
White-rumped Spinetailed Swift	<i>Chaetura leucopygialis</i>
White-bellied Swiftlet	<i>Collocalia esculenta</i>
Grey-rumped Swiftlet	<i>Collocalia francica</i>
Thunberg's Swiftlet	<i>Collocalia fuciphaga</i>
Brown-rumped Swiftlet	<i>Collocalia vestita</i>
KINGFISHERS:	
Forest Kingfisher	<i>Ceyx erithacus</i>
White-collared Kingfisher	<i>Halcyon chloris</i>
Stork-billed Kingfisher	<i>Pelargopsis capensis</i>
BEE-EATERS:	
Blue-throated Bee-eater	<i>Merops viridis</i>
HORNHILLS:	
Wreathed Hornbill	<i>Aceros undulatus</i>
Northern Pied Hornbill	<i>Anthracoceros malabaricus</i>
Rhinoceros Hornbill	<i>Buceros rhinoceros</i>

BARBETS:	
Little Barbet	<i>Megalaima australis</i>
Coppersmith Barbet	<i>Megalaima haemacephala</i>
Black-banded Barbet	<i>Megalaima javensis</i>
Dull Barbet	<i>Megalaima zeylanica lineata</i>
PITTA:	
Banded Pitta	<i>Pitta guajana</i>
BULBULS:	
Black-headed Bulbul	<i>Pycnonotus atriceps</i>
Golden-vented Bulbul	<i>Pycnonotus cafer aurigaster</i>
Yellow-vented Bulbul	<i>Pycnonotus goiavier analis</i>
Yellow-crowned Bulbul	<i>Pycnonotus zeylanicus</i>
LORAS AND LEAFBIRDS:	
Common Iora	<i>Aegithina tiphia scapularis</i>
Green Leafbirds	<i>Chloropsis</i> spp.
ROBINS:	
Shortwings	<i>Brachypteryx</i> spp.
White-rumped Sharma	<i>Copsychus malabaricus</i>
BABBLERS:	
Lesser Red-headed Babbler	<i>Malacopteron cinereum</i>
Black-capped Jungle Babbler	<i>Pellorneum capistratum</i>
Horsfield's Jungle Babbler	<i>Trichastoma sepiarium</i>
WARBLERS:	
Fantail Warbler	<i>Cisticola exilis</i>
FLYCATCHERS:	
Hill Blue Flycatcher	<i>Muscicapa banyumas</i>
Pied Fantail Flycatcher	<i>Rhipidura javanica</i>
Paradise Flycatcher	<i>Terpsiphone paradisi</i>
FLOWERPECKERS:	
Scarlet-headed Flowerpecker	<i>Dicaeum trochileum</i>
SUNBIRDS:	
Yellow-breasted Sunbird	<i>Nectarinia jugularis</i>
MYNAHS:	
Grackle	<i>Gracula religiosa</i>
DRONGOS:	
Grey Drongo	<i>Dicrurus leucophaeus</i>
Hair-crested Drongo	<i>Dicrurus hottentottus</i>
Chinese Black Drongo	<i>Dicrurus macrocerus</i>
ORIOLES:	
Black-naped Oriole	<i>Oriolus chinensis</i>



MOUNT KINABALU, NORTH BORNEO

By

E. J. H. BERWICK*

Tom Harrison tells a good story of Kinabalu, recalling a time when he was flying over Borneo in an American Liberator: "I was along with a crew one day and the pilot put it:— "Gee, say—that goddam peak can't be only 18,000 feet something. Why, it's as high as Everest." Americans have their own way of putting the world to rights. They solved this bit by overprinting all their airmaps, cancelling out the properly surveyed height of 13,455 feet, with a big black stamp which said, flatly, 19,000 feet." That may be overdoing it, but Kinabalu remains the highest mountain between Burma and New Guinea, and twice the height of most of the mountains in Malaya.

It is one of the most inspiring mountains I have ever seen and it is difficult to do it justice in a short article. It is part of the Crocker range which rises to 5,000-6,000 feet but it stands out sheer from it, a block of granite, ten to twelve miles long as seen from most directions. And it commands the whole of North Borneo; it can be seen clearly from Labuan, Keningau, Kota Belud (Plate XXV) and Kudat; one has only to go up in a plane a few hundred feet at Sandakan and Tawau and there it is in the distance like a lump of sugar; by cutting a few branches off a tree in Jesselton, I have got a wonderful view of it from my office desk. On the North and East sides of the mountain there is primary forest in abundance but on the South and West the local Dusuns have felled much of it to cultivate dry padi and there are large patches of secondary jungle. Above 6,000 feet the trees are smaller and at 8,000-10,000 there is moss forest such as you get on the top of Gunong Tahan in Malaya; above this, much is bare rock, but there are still many bushes and shrubs about and within fifty feet of the top there are *Potentillas* snuggling in the crevices between the rocks.

The plants are a delight. I have been fortunate enough to go up with two botanists, luckily on two separate trips; Betty Molesworth Allen darted about the place catching ferns while Ted Allen (no relation) made a bee-line for *Aeschynanthus splendens* and *A. magnifolia*. I have always been fascinated by the Rhododendrons and the Pitcher plants, both of which occur in abundance. As far as records go, the first person to climb Kinabalu was Hugh Low, Government Secretary in Labuan, who went up in March 1851, and the highest point on the mountain, Low's Peak, is named after him. He saw for the first time the huge *Nepenthes rajah*, the bowl of which can hold up to four pints of water. Spencer

* Founder member, Honorary Secretary/Treasurer 1948-1950.

PROTECTION OF WILD LIFE IN THE FEDERATION OF MALAYA

By

J. A. HISLOP*

The need for the protection of wild life in the Federation of Malaya† has been felt since the end of the last century, but positive action has been slow and gradual over the years and the need today is greater than ever. The intervening period has seen the clearing of much jungle and the depletion of numbers of the larger mammals, and many a herd of elephant has been wiped out simply because it had nowhere to go. However, rather than dwell upon the sadder side of the picture, it may be more enlightening to follow the path of the efforts made on the side of protection.

Legislation

The first laws to be promulgated in defence of Malayan wild life were incorporated in the Straits Settlements‡ Ordinance No. 111 of 1894 which was of limited scope and afforded protection to certain wild birds only. These 'wild birds' were classified as such by not being included in the incorporated schedule of thirty-three birds consisting of game birds such as snipe, green pigeon, quail, curlew, doves, jungle fowl and pheasants, and eight species of hawk. This ordinance remained in force until the Wild Animals and Birds Ordinance of 1904, which gave power to the Governor in Council to establish a close season and prohibit the killing or taking of any specified wild animal or bird. Under this Ordinance elephant, rhinoceros and tapir were given full protection towards the end of 1924 in the Dindings (ceded back to the State of Perak in 1935), and in January 1930 the shooting of green pigeon was totally prohibited in the Settlement of Malacca. The netting or snaring of snipe and of green pigeon had previously been prohibited throughout the Straits Settlements in 1914 and 1924 respectively. There was no provision in any of these enactments for the creation of sanctuaries or reserves.

In 1880, the State of Selangor adopted the 1894 Ordinance of the Straits Settlements *mutatis mutandis* and that of Perak passed an order for the protection of wild birds of bright plumage.

The next State to take action was Pahang when in an ordinance protecting 'Products of State Land' it was stated that "any person not

* Chief Game Warden, Federation of Malaya, 1957-60..

† See page 248 for clarification on the history of the eleven States that now comprise the Federation of Malaya.

‡ The Colony of the Straits Settlements comprised the territories of the Dindings, Malacca, Penang Island, Province Wellesley and Singapore Island. The first four now form part of the Federation of Malaya.

licensed or authorised in that behalf, who shall cut, dig, destroy, or take away from any state land any product of such state land, or capture, kill or wound any elephants, seladang or rhinoceros (except in self defence in case of attack) shall be liable to punishment". Any person convicted under this section was liable to a fine not exceeding \$200 or imprisonment of either description not exceeding one year, or both. All powers were invested in the Resident, and offenders could be arrested without warrant by a police officer or officer of the Land Department. Licences to shoot or capture elephant, rhinoceros or Seladang, valid throughout the locality stated in such licence, could be issued by any Government revenue collector authorised by the Resident.

In November 1902, the States of Selangor and Perak took another step by publishing a more comprehensive enactment to provide for the Protection of Wild Animals and Birds. Licences to shoot big game or wild birds could be issued only by the Resident, and this example was followed in January 1903 by the State of Negri Sembilan.

The 1902 Enactment, however, did not satisfy the public and a new enactment was passed in 1904 in Perak, Selangor, and Negri Sembilan. Pahang, however, remained aloof until 1911 when an Enactment embracing all four Federated Malay States was passed. This Enactment although more elaborate than any of its predecessors still did not provide for any organisation to enforce the law.

It may be mentioned here that the only outstanding feature of the 1902 Enactment was the creation of the Chior Game Reserve in Perak on the 24th of March 1903, Malaya's first Game Reserve, an important step indeed in the days when wild lives were held even more cheaply than now. The laws generally were very lax, and although it had been an offence from 1904 to shoot an immature elephant or rhinoceros, no standards of maturity were laid down until 1922!

In 1921, after much effort on the part of conservationists, proposals for a new bill for the Federated Malay States were put forward. This Enactment, which became law in January 1922, included provision for the appointment of State Game Wardens; no money, however, was provided for payment of salaries and the law was enforced by Honorary Game Wardens. The first paid appointee was W. E. McNaught, who was appointed Game Warden, Perak on 14th October, 1927. Negri Sembilan followed suit by the appointment of H. H. Banks on 1st January 1928, and on 20th September of that year A. H. Fetherstonhaugh became Assistant Game Warden, Pahang. H. H. Banks died in June 1929, and it was many years before the vacancy was filled. Selangor has never had a full time Game Warden, always sharing an appointment with Negri Sembilan and Malacca.

Further changes took place as time went on. The Enactment of 1921 was amended in 1928 and superceded in 1925. Amendments to "The Wild Animals and Birds Protection Enactment, 1925" were introduced in 1928 and 1931 and there the matter rested until Chapter 193 of the Laws of the Federated Malay States 1935 was published. This Enactment was in effect the compilation of the 1925 Ordinance complete with amendments. The elephant and the Sambur Deer were both declared "Unprotected animals" in July 1929, though the former was again brought under protection in May 1931.

In the unfederated Malay States, Johore lead the field with Enactment No. V of 1912, which remained in force until 1923. This ordinance gave protection to big game, deer and birds, and licences to shoot could only be issued by the Sultan or by an officer authorised by him in writing. The fees were high and this in itself assisted in preserving wild life. There was no provision for close seasons, and 'deer' included 'wild pig'. In 1923 new legislation, based on the 1922 Enactment of the Federated Malay States, was passed which provided for the appointment of a Game Warden. Amongst other oddities there was no protection for snipe or green pigeon and this state of affairs remained until June 1927, when the first five months of the year were declared to be the close season. In 1928 the retrograde step of rescinding all "Game Reserves" in the State was taken, and it was decided in future to limit the activities of the Game Warden and his Rangers to certain jungle areas, which included the main Forest Reserves, east of the railway line.

In Trengganu the first laws were passed in the form of Enactment No. 1 of 1342 (13th August, 1923). The only animals protected were all elephant, rhinoceros, Seladang and tapir, there being no protection for deer or game birds until two years later when the killing or taking of female Sambur or Barking Deer was prohibited, but with a penalty of only \$20 for each head. In the same year the shooting or taking of Argus or Fire-backed Pheasants was prohibited except under licence at \$5 per bird. The penalty in this instance was a maximum of \$50 or one month in gaol. Measures taken to enforce these laws were, however, practically non-existent.

In Kelantan an order was passed in 1921 protecting elephant, rhinoceros, Seladang and tapir, all of which could be shot on licence. No restriction, however, was put upon the shooting or killing of immature big game or deer of any sex, and no Game Rangers or other officers were appointed to enforce the law. Another advance was the Enactment of August 1930 which controlled the trapping and export of doves and other popular cage birds.

Kedah and Perlis had no conservation laws until the 1st of January 1956, but there has been an Assistant Game Warden, Kedah for many years and in 1956 his authority was extended to cover Perlis. The State Forest Officer, Kedah, who was first appointed in 1921, was also Game Warden in that State until 1948 and exercised authority under the Forest Enactment.

A very big step forward was made in March 1955 with the enactment of the "Wild Animals and Birds Protection Ordinance, 1955" by the Federation of Malaya Government. This ordinance came into force on the 1st of September, 1955 in the States of Malacca, Negri Sembilan, Pahang and Selangor, on the 1st of January, 1956 in the States of Kedah, Perak and Perlis, on the 1st of October, 1956 in Penang, on the 1st of April, 1957 in Kelantan, on the 15th March, 1958 in Trengganu and on the 1st of November, 1959 in Johore. Thus it was not until the end of 1959 that satisfactory legislation existed over the whole Federation of Malaya, sixty years after the passing of the first wild life ordinance in the Straits Settlements.

This Ordinance gave protection to Monitor Lizards, which had hitherto been ruthlessly exploited for skins, and provided the means for giving protection to any other animal declared to be "a reserved animal". These animals could only be taken on a licence granted by the Game Warden. In addition a schedule of "Totally Protected Animals" was introduced, which gave absolute protection to rhinoceros, Pangolin or Scaly Anteater (*Manis javanica*), Binturong or Bear Civet (*Arctictis binturong*), Slow Loris (*Nycticebus coucang*), gibbons (*Hylobates* spp.) and tapir (*Tapirus indicus*). Bear (*Helarctos malayanus*) for some obscure reason was elevated to the status of "Big Game", which included elephant, Seladang (*Bibos gaurus*) and Banteng (*Bibos sondaicus*). The bear is not a sporting animal nor of great value as a trophy, while the Banteng, if indeed it still existed in Malaya at the time of the introduction of the Enactment, must have been one of the rarest of Malayan animals! A further improvement was the giving of protection to mouse deer for the first time.

The "Game Birds" schedule remained more or less unchanged but in place of "Common Birds" a schedule headed "Birds which are neither Game Birds nor Totally Protected Birds" was introduced. All birds not included in either of these schedules were totally protected.

Licences to carry on the business of a taxidermist, game dealer and dealer in animals and birds were introduced. These helped greatly to control illegal traffic and dealings in wild life, both alive and dead.

Laws governing the import and export of animals and birds were also introduced. Unfortunately owing to an ambiguity any licence holder could import or export any number of animals for the basic fee of \$2.

It was also most unfortunate that there was inadequate provision to deal with steel wire snares and the misuse of sodium arsenite, two of the greatest killers of wild life known.

In 1958 steps were taken to revise the ordinance and it is hoped that this version when gazetted will at last be adequate.

Game Department

Retracing our steps a little, it is important to remember that with the appointment of T. R. Hubback in 1928 as Honorary Chief Game Warden, Federated Malay States, and Honorary Adviser in the Colony of the Straits Settlements and in the Unfederated Malay States, an indelible landmark was established in the field of wild life conservation. Hubback was the father of the present day Game Department and to him we owe the creation of Malaya's National Park.

The second major landmark was the setting up of a Wild Life Commission of Malaya in 1930. T. R. Hubback was appointed Commissioner and G. Hawkins his Assessor. Their report which appeared in three volumes in 1932 is the complete reference book to the history of conservation in Malaya up to that date, and the author makes no apologies in recognising it as the source of all the pre-1932 information provided in this paper. This report is unfortunately out of print and copies are extremely difficult to obtain.

In this report Hubback recommended the following:— the appointment of a Commissioner for Wild Life and of a Commissioner for National Parks (initially one officer to cover both posts); the passing of two enactments, one for the "Preservation of Wild Life" and the other for "National Parks"; the establishment of a "Wild Life Fund"; the constitution of Sanctuaries under secure tenure, and including the establishment of the Gunong Tahan National Park and the raising of the Krau Game Reserve to the status of a National Park; the declaration of open seasons for shooting or killing game; the total prohibition of the commercialism of Wild Life; the creation of Wild Bird Refuges; the appointment of Honorary Deputy Game Wardens to assist the Game Wardens provided for in the Wild Life Preservation Enactment; and the conservation of the riverine fish.

This report led to the secondment of Capt. A. T. A. Ritchie from Kenya in 1937 at the request of the Federated Malay States Government. He soon organised a Game Department with a staff consisting of a Chief

Game Warden, three Deputy Game Wardens, two Control Officers, and a Superintendent for the King George V National Park, now known as Taman Negara and which was created in 1938. The first Chief Game Warden after Capt. Ritchie was E. O. Shebbeare who was a founder member of the Malayan Nature Society and its first President. Today the Game Department has grown to an establishment of a Chief Game Warden, seven Game Wardens, ten Assistant Game Wardens and ninety-nine Game Rangers, but unfortunately the delay in filling up some of the senior vacancies during the past ten years has made the enforcement of the existing laws difficult.

Game Reserves

The first Game Reserve, as mentioned earlier, was the Chior Game Reserve in Perak which was gazetted in 1902. Twenty years lapsed before the next reserve or sanctuary was proclaimed, but then in the short space of eighteen months six Game Reserves were created. These were Frasers Hill, Kuala Selangor, Bukit Kutu, the Golf Course at Kuala Lumpur (all in Selangor), Serting (Negri Sembilan) and Krau (Pahang). Sungei Lui and Gunong Tahan Game Reserves, both in Pahang, were proclaimed two years later in 1925, Sungkai (Perak) in 1928, three small islands off Port Dickson (Negri Sembilan) in 1926 and an area in Kelantan in 1929. The latter together with the Gunong Tahan Game Reserve, and adjacent areas in Trengganu and Pahang became the King George V National Park in 1938, now known as Taman Negara. The two adjoining Game Reserves of Serting and Sungei Lui were revoked in 1929, and Krau Game Reserve, the most important sanctuary for Seladang in Malaya, was nearly lost at the same time. Other small reserves or sanctuaries include Weld Hill Forest Reserve in the heart of Kuala Lumpur, the grounds of the Forest Research Institute at Kepong (Selangor) some ten miles north-west of Kuala Lumpur and a small area for green pigeon near Pekan, Pahang.

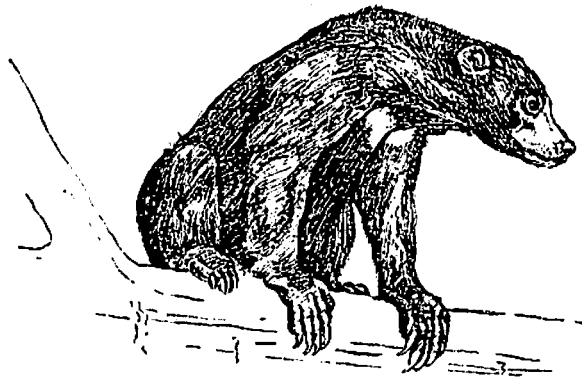
In Johore three large areas are often shown as Game Reserves on maps; they are the Segamat Wild Life Sanctuary, the Endau-Kluang Game Reserve and the Endau-Kota Tinggi Game Reserve. The situation, however, in these three areas is anomalous since they have never been properly constituted under the provision of any Wild Life Enactment and their boundaries include, apart from large commercially exploited Forest Reserves, much alienated and occupied land. They owe their position to the very strict shooting laws in force in Johore under the late Ruler, His Highness Sultan Ibrahim ibni Almarhum Sultan Abu Bakar.

In addition to the above Reserves very large areas of Malaya have been gazetted as Forest Reserves, but at present they can in no way be considered as satisfactory sanctuaries for the larger game. However, as

the pressure for land increases there is no doubt that if a sensible overall land use policy for Malaya is to be instituted and one in which the conservation of wild life is to play its part, it will be absolutely essential for both the Forest Department and the Game Department to work closer together than in the past and to provide comparatively small strict sanctuaries for wild life in carefully chosen localities within existing large Forest Reserves.

Reference

Report of the Wild Life Commission of Malaya, 1930; Vols. I—III. Government Printing Office, Singapore, 1932.



WILD LIFE CONSERVATION IN NORTH BORNEO

By

P. F. BURGESS

The colony of North Borneo, with about eighty per cent of its 29,388 square miles still under evergreen rain forest, may be conveniently divided for purposes of discussion here into the West Coast and Interior Residencies, and the Sandakan and Tawau Residencies. Extensive shifting cultivation is practised in the hilly West Coast and Interior Residencies and little primary forest remains there; the population density averages about thirty-one persons per square mile. In the less mountainous Sandakan and Tawau Residencies man has until recently made little impact on the forests and the population density is less than six persons per square mile.

The island of Borneo lies on the Sunda Shelf and in prehistoric times was connected to the mainland of Asia. The fauna of the Malaysian region (that is the Malay Peninsula, Sumatra, Java, Borneo and the adjacent small islands) has affinities largely with the Indo-Chinese sub-region and a western and an eastern drift from that sub-region can be recognised. In the western drift many mammals reached Borneo through Malaya and Sumatra, with the notable exception of the tiger, Malayan tapir and the common Malayan wild pig. The banteng and the Ferret Badger (which are absent from Malaya and Sumatra) reached Borneo from the Indo-Chinese sub-region on the eastern drift, and the Proboscis Monkey also has strong affinities through that drift with the Indo-Chinese sub-region. The Megapode or Incubator Bird is an interesting example of a species which has crossed Wallace's Line from the Australian region. Borneo being a continental island with no longer any connection with the mainland of Asia, has a fauna which is particularly vulnerable; should any species become extinct through man's activities there is no possibility of natural recruitment from the mainland of Asia.

Legislation

The Wild Animals and Birds Preservation Ordinance, 1936, contains the main legislation for the protection of wild life; elephant, rhinoceros, banteng, tarsier, orang utan, gibbon and Proboscis Monkey are all protected and the maximum penalty for shooting, killing, capturing, wounding or keeping any of these without a licence is a fine of up to \$500 and imprisonment for six months. Shooting deer with a blowpipe is not controlled, but if firearms are used a licence is necessary. Game licence fees are \$100 per head for elephants and \$20 and \$5 respectively

for unlimited licences to shoot banteng and deer. The Ordinance contains a long list of protected birds; those not protected include the petrels, duck and teal, most birds of prey, several partridges and pheasants, plovers, curlews, snipe, pigeons and parrots.

Licences to shoot elephant, banteng, deer and protected birds may be issued by the Governor, the Residents, District Officers and the Conservator of Forests respectively, and it is declared Government policy not to issue licences to shoot deer and banteng for the sale of their meat. The shooting of tarsier, orang utan, gibbon and Proboscis Monkey is prohibited, though the Governor (who has in this respect delegated his powers to the Conservator of Forests) may issue licences to keep these animals as pets. The issue of licences to kill rhinoceros has been prohibited since April 1947. Specific penalties are laid down for shooting female animals under game licences and these range from \$5 for a doe to \$500 for a cow elephant; fishing with explosives, pursuing game with cars or aeroplanes, using headlights or spotlights to dazzle game, shooting from trains or steamers, using spring guns, sharpened stakes or fire for hunting are all forbidden. A land holder may kill any protected animal in defence of human life or his crops or property. In order to restrict trade in wild animals, the import of rhinoceros, banteng, tarsier, orang utan, gibbon or Proboscis Monkey has been forbidden under the Customs Ordinance since 1950, and the export of birds is also prohibited except under licence from the Conservator of Forests.

The Birds Nest Ordinance, 1914, is concerned with the orderly exploitation and marketing of edible bird-nests rather than the conservation of the swiftlets producing them. There is, however, provision for the District Officer to regulate the taking of nests and all nest collectors are required to have permits.

The Turtle Preservation Ordinance, 1917, is designed to control the killing of turtles and the collection of turtle eggs, and licences are issued by the principal European Customs Officer of any port or by the District Officer under this Ordinance. The Green Turtle (*Chelonia mydas*) is the egg producing turtle, and the Hawksbill Turtle (*Eretmochelys imbricata*) the producer of turtle shell. The maximum penalty for offences under the Ordinance is a fine of \$100 and imprisonment for six months.

The Forests Ordinance, 1954, prohibits hunting and fishing in Forest Reserves, except under permit issued by a Forest Officer, and the maximum penalty is a fine of \$1,000 and imprisonment for six months. All tusks and similar trophies are forest produce when found in Forest Reserves, and their disposal is under the general control of the Conservator of Forests.

It will be seen that the administration of the various Ordinances concerned with the conservation of wild life is divided between the Governor, the Residents, District Officers, Customs Officers and Forest Officers, and at present no single authority is responsible for the protection of wild life as a whole. In practice, hunting and shooting within Forest Reserves is controlled by the Forest Department staff and in other lands such control is in the hands of the licensing authorities.

Sanctuaries

Bird sanctuaries have been declared at Sipidan Island (a possible nesting place of the Lesser Frigate Bird), Bohaydulong Island (a nesting place of the Megapode), Kota Belud (visited by migratory wild fowl during the winter months) and at Labuan. A proposal was made in 1933 to reserve under the Land Ordinance a considerable area in the Upper Segama and Tenggayu drainages in order to protect rhinoceros, but this proposal had to be abandoned due to opposition by timber interests. Consideration is being given now to reviving the proposal in a modified form.

Present Status of Principal Animals

Since the termination of the British Borneo Timber Company's monopoly in 1952, the forests of North Borneo have undergone great development and many areas hitherto untouched by man have been worked, largely by mechanical methods, for timber. These areas have been made accessible by road and rail and timber camps of considerable size established far into the jungle. Great agricultural expansion has also taken place in the Apas and Quoin Hill areas of Tawau, at Mostyn, behind Semporna, to the west of Lahad Datu, and in the Sandakan Peninsula a main trunk road is under construction from Sandakan westwards to Telupid on the Sg. Labuk where large scale development of rich volcanic soils for agriculture is envisaged. The impact of this development upon the wild life of the Colony varies considerably from species to species.

The principal animals of the Colony are considered briefly in the following notes, and an attempt has been made to evaluate the effect of the development of the Colony on the more important species:—

Order - Primates

Family - Simiidae

The Orang Utan (*Simia satyrus*) (syn. *Pongo pygmaeus*).

North Borneo remains one of the strongholds of this generally rare species. There is evidence from the number and distribution of the peculiar nesting platforms which this animal builds in trees and from visual records and captures, that the species is distributed throughout the Colony, and that the stock is a

considerable one. Since, however, nesting platforms are usually used only for one night, the presence of a large number of these platforms does not necessarily indicate the presence of a large number of orang utan. The extension of timber working and land clearance for alienation is not so favourable for the survival of the orang utan as it is for deer, banteng and elephant; the orang utan is relatively easily captured and cases continue to occur where the young are caught after the mother is either shot or killed in tree felling operations. It is impracticable to return these young animals to the jungle and it is Forest Department policy to take possession of them and keep them under Departmental arrangements until they are large enough to be presented to overseas zoological gardens. Exports of orang utan under these arrangements during the past five years have been as follows:—

1956	—	2	individuals
1957	—	5	..
1958	—	2	..
1959	—	5	..
1960	—	3	..

Departmental proposals have been made for the establishment within one of the larger Forest Reserves of a station where captured young orang utan can be fed and allowed increasing freedom until they return to the jungle of their own accord, and in view of the increasing rarity of this species throughout the world it is considered that such arrangements would be preferable to the export of captured animals.

Family - Hylobatidae

The Sunda Island or Grey Gibbon (*Hylobates moloch*)

Only the one species of gibbon occurs in North Borneo and it is protected under the Wild Animals and Birds Preservation Ordinance. Gibbons are, however, often caught, particularly in timber felling operations, and kept as pets. They rarely live very long in captivity abroad and frequently suffer from pulmonary complaints; licences to keep captured gibbons within the Colony are issued reasonably freely. There is no indication that the stock is in any way declining.

Family - Cercopithecidae

The Crab-eating Macaque (*Macaca irus*)

The Pig-tailed Macaque (*Macaca nemestrina*)

The Crab-eating Macaque is commonest in estuarine swamps, but is found throughout the country up to 4,000 feet. The Pig-tailed Macaque is usually found in lowland forest and is not attracted to river banks and seashores as is the Crab-eating Macaque. The Pig-tailed Macaque occasionally causes damage in rice fields and is often tamed for picking coconuts. Neither species is in danger of becoming rare.

Family - Colobidae

The Banded Leaf Monkey (*Presbytis femoralis*)

The Sunda Island Leaf Monkey (*Presbytis aygula*)

The Maroon Leaf Monkey (*Presbytis rubicundus*)

The White-fronted Leaf Monkey (*Presbytis frontalis*)

The Silvered Leaf Monkey (*Trachypithecus pyrrhus*)

The leaf monkeys, particularly *P. aygula* and *P. frontalis*, were formerly



much persecuted in Sarawak as the source of bezoar or geliga stones, but there is no record of leaf monkeys being destroyed for this purpose in North Borneo during recent years.

The Proboscis Monkey (*Nasalis larvatus*)

This species, allied to the leaf monkey, is confined to Borneo, but is by no means rare in the mangrove and riparian forests of the Colony. The species is rarely molested and cases of capture or shooting are almost non-existent. It occurs in the coastal forests of both the East and West Coasts of the Colony and appears to prefer to sit in trees over water. There is no danger at present of this species becoming extinct.

Family - Tarsiidae

The Tarsier (*Tarsius tarsier*)

This animal is protected, but is nocturnal and is rarely seen or molested.

Order - Carnivora

Family - Ursidae

The Malay Bear (*Ursus malayanus*)

This animal is not commonly seen in North Borneo but appears to be more common on the West Coast than the East. It occasionally causes damage by eating the leading shoots of coconut palms, but it is rarely molested.

Family - Viverridae

The Binturong (*Arctictis binturong*)

This is the largest civet in Borneo and since it is largely nocturnal and also spends much of its time in the tree tops, it is rarely seen or molested. One was, however, shot in Kretam in 1957. This is a species of the primary forest and at present appears to be in no danger of becoming rare.

Family - Felidae

The Clouded Leopard (*Felis nebulosa*)

The Marbled Cat (*Felis marmorata*)

The Leopard Cat (*Felis bengalensis*)

The Flat-headed Cat (*Felis planiceps*)

These, with the exception of the Clouded Leopard, are small animals, about the size of a domestic cat; the Clouded Leopard may reach nearly six feet "between pegs", but nearly half this length is tail. Little is known of the distribution of the smaller cats, but the Clouded Leopard has been recorded on several occasions at Kalabakan near Tawau. All the cats are forest dwellers and are in no danger of becoming extinct.

Order - Edentata

Family - Manidae

The Scaly Anteater or Pangolin (*Manis javanica*)

The skins and scales of these animals were exported in considerable quantity before the war to China where they were used for making charms. During the period 1912-1935, no less than 2,300 pangolin were killed every year to maintain this trade, but of recent years exports have almost entirely ceased and the animal remains relatively unmolested.

Young orang hutan.

G. S. Brown.

Order - Ungulata**Family - Elephantidae****The Asiatic Elephant (*Elephas maximus*)**

The origin of the North Borneo elephants is obscure, though it is commonly believed that they are the descendants of a number of beasts given to the Sultan of Sulu by the East India Company in 1750 and subsequently liberated in North Borneo. There are, however, records of the existence of elephants (probably tame ceremonial beasts) in Brunei in 1521 and there are also fossil relics of elephant bones. The elephant of North Borneo is confined to the East Coast and does not appear to have penetrated north of the Sugut River. The species extends south into Indonesian Borneo and the limits in this direction are not precisely known. The western limits of elephant in North Borneo are indefinite, but they have recently been recorded as reaching Penungah on the Kinabatangan River for the first time and they are occasionally, though very rarely, recorded near Pensiangan, probably having entered from Indonesian Borneo. The North Borneo elephant is far less shy of man than is his Malayan counterpart and many instances have been recorded of elephant staying in close proximity to forest operations for considerable periods and refusing to move on. Borneo elephants are popularly supposed to be smaller than those of Malaya and Burma, but it would probably be more correct to say that large bulls are rarer. An average elephant in North Borneo appears to be no smaller than that in Malaya; forefoot diameters of fifteen inches and more are not uncommon. Elephant in the settled areas of the East Coast are persistent crop raiders and occasionally individuals are shot for this reason; there is no indication of any decline in numbers in the elephant population due to the control of crop raiders. The largest pair of tusks on record from the Colony was found in the forest near Tawau, weigh thirty-three and thirty-two and a half pounds, and each measures four feet eight inches along the outer curve; there is no reason to suppose that these tusks are exceptionally large, since systematic recording of information of this kind has only recently been established in the Colony. It would appear that forest exploitation and regeneration operations in general favour elephants, since the regenerated forest contains more feed than did the primary forest which it replaces. The constant presence of man and noisy mechanical extraction plant in the forest may, however, have a tendency to move the elephants into the undisturbed primary forests of the centre of the Colony, and this may account for the presence recently of elephants further west than previously recorded.

Family - Suidae**The Bearded Pig (*Sus barbatus*)**

This is the only species of pig recorded from the Colony, the common wild pig of Malaya (*Sus cristatus*) not having reached Borneo. There is considerable variation in the colour of *Sus barbatus*, some individuals being white. Local migrations of Bearded Pig are well known and are said to be due to the fruiting of certain trees (possibly *Shorea gysbertsiana*, the illipe nut), and during these migrations enormous numbers of pig are sometimes shot. Pig are very common around cultivation and are declared a pest under the Agricultural Pests Ordinance 1917. They appear, however, to be well capable of holding their own and there is no risk of the species becoming extinct. The lack of tiger in North Borneo is probably one reason for the extremely large pig population.

Family - Tragulidae**The Larger Mouse Deer (*Tragulus javanicus*)****The Smaller Mouse Deer (*Tragulus hanchil*)**

These small deer are both shot and trapped in large numbers, but even in the heavily shot areas it is remarkable how many may be seen along timber extraction routes with a torch at night. There would appear to be little danger of this animal becoming rare.

Family - Cervidae**The Sambur (*Cervus unicolor*)**

The common Malay name *rusa* is not commonly used in Borneo, where the species is known as *payau*. The Sambur is largely parasitic on man and appears to congregate in large numbers around food crops and shifting cultivation on the edge of the forest. For this reason and because the meat is in great demand, this species suffers more from excessive shooting than any other animal in the Colony. The creation of lush grazing along timber extraction routes, the settlement within the forest of large camps of forest workers with inadequate meat supplies, and the fact that Sambur can easily be shot with a shotgun, has led to widespread slaughter of these deer wherever the forest is opened up. It has even recently become necessary to permit the shooting of Sambur for the sale of meat in the Semporna sub-district, though in general Government policy is against such shooting. As mentioned previously, the use of powerful lights to dazzle animals is illegal under a Rule made under the Wild Animals and Birds Preservation Ordinance, but the use of headlamps for night shooting of deer is extremely widespread and the control of such illegal shooting is in general difficult to enforce. As in Sarawak, it appears likely that the only way of preserving this species will eventually be in game sanctuaries, where the entry of human beings is forbidden except under carefully controlled conditions. The vast forests of the centre of the Colony, however, must still contain a considerable stock of Sambur and there is no immediate danger of the species becoming rare. The control of illegal shooting of Sambur outside Forest Reserves is in the hands of the licensing authorities.

The Barking Deer (*Muntiacus muntjak*)

This inoffensive animal suffers like the Sambur from considerable shooting, both legal and illegal. It is, however, less given to congregating near cultivation than the Sambur and is more an animal of the primary forest. Considerable numbers are shot by survey and prospecting parties, but there is no reason to suppose that the number killed is greater than the natural increase.

Family - Bovidae**The Banteng (*Bibos sondaicus*)**

Banteng are not entirely forest dwellers and require grassland or secondary forest for their food supply. As a result, they tend to cause damage to cultivation and since they are not aggressive they are very vulnerable to poaching. The exploitation of the forest for timber is followed by the establishment of lush regrowth with grass (not *Imperata*) along extraction routes and this is very favourable for the banteng; provided poaching and unnecessary shooting in defence of crops can be kept under control, the future for this species is good. Unfortunately, the meat of banteng is in great demand, since very few domestic cattle are kept on the East Coast, and there is no doubt that considerable illicit

slaughter of banteng takes place. The shooting of the species for the sale of meat has now been prohibited by Government, but in the immediately post-war years banteng meat was shipped from Tungku in Darvel Bay in specially constructed refrigerated launches and it is gratifying to record that this trade has now entirely ceased. The control of illegal shooting of banteng outside Forest Reserves is carried out by the Administration and the Police Department.

Family - Rhinocerotidae

The Sumatran or Two-horned Rhinoceros (*Didermoceros sumatrensis*)

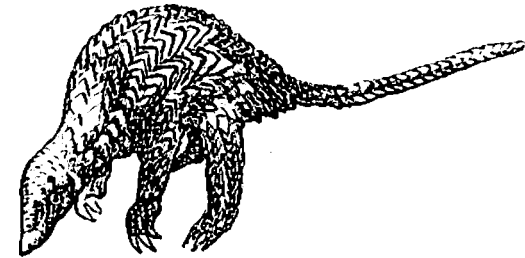
This animal is more in need of protection than is any other species of mammal found in the Colony. Throughout the East the rhinoceros has suffered from poaching due to the supposed aphrodisiac properties of all parts of the carcass, but in particular the horn, and North Borneo is no exception. There is no provision under existing legislation to make the possession of rhinoceros horn an offence, and since rhinoceros are found only in remote areas and the horn is relatively easily concealed, poaching is difficult to control. Rhinoceros have been recorded during recent years in the Upper Kinabatangan, the Darvel Bay forests, the Dent Peninsula, near Ranau, and in the Interior Residency, where in 1957 the Resident recorded that rhinoceros were on the increase. Any estimate of the numbers of rhinoceros living in the Colony today is bound to be largely guesswork, but it is unlikely that more than twenty to thirty individuals exist. The Forest Department has evidence of rhinoceros poaching having taken place in the Darvel Bay area in 1958 and the presence of Iban hunters (recruited in Sarawak) in the timber camps is a powerful factor in the organisation of rhinoceros poaching. A rhinoceros was shot illegally in Ranau in 1958 and the offender convicted in court. It is of interest to record that during the years 1912-28, legal exports of rhinoceros horn alone indicated that about twenty rhinoceros a year were being killed, but it is probable that many of the exports were of horn imported from South Borneo. Only the most determined efforts, including constant patrolling by game rangers employed solely for the purpose, combined with the enactment of legislation to make the possession of parts of rhinoceros illegal, is likely to save this species from extinction in North Borneo. Every step in the development of the Colony, whether it be alienation of land for agriculture or the exploitation of the forests for timber, is likely to result in the further destruction of rhinoceros and ultimately the preservation of the species within a large and well patrolled game sanctuary is probably the only possible means of ensuring its survival.

Birds

Relatively little shooting of birds for sport or for food is carried out in the Colony. The number of migrant duck visiting the Kota Belud area during the winter months has, however, declined of recent years if pre-war tales of the shooting enjoyed there are to be believed. This decline may well be due to the stalking of duck on the water by natives using water buffalo to approach the birds, and it is hoped that the declaration of a bird sanctuary over the main marsh visited by the duck will go a long way to encouraging their return. The number of *pergam* (Green Imperial Pigeon) and *punai* (mainly Pink-necked Green Pigeon) which flight to and from the mangrove in the evening and early morning is enormous and must be reminiscent of the numbers said to flight in Perak and Selangor in the 1920's. The pheasants and partridges are caught in traps, particularly by timber camp employees, but there is no reason to suppose that this trapping, though largely illegal, is in any way reducing the stock of these

birds. The eggs of the Megapode are valued as food and are collected in considerable quantities by the natives, but in order to protect the egg supplies the natives themselves are reluctant to kill adult birds, which are thus reasonably effectively protected.

In conclusion it should be emphasised that the rich wild life heritage of North Borneo remains as rich as it is largely because the Colony has been little developed. There are now signs, however, of rapid economic development, though the possible dangers therefrom to wild life should be offset by a new Wild Life Conservation Bill which is shortly to be introduced in the Legislative Council.



Since birds are being ringed over the world, and since some travel great distances, anyone may be fortunate enough to find or meet someone who has found a ringed bird. Members of the Nature Society may be sought out by one who has found a ringed bird since their interest in nature is well known. This gives the naturalist an opportunity to explain the reasons for bird ringing and to discuss the values of birds. The ring should be sent to the address given on it, or the number carefully copied from it, along with the name of the person finding the ring, his address, and the date and place where the ring was found. It is not necessary that the bird species be known or given, for the sender will be notified what the species was, where and when it was ringed and by whom. In turn the person who ringed the bird will be notified so he can know of its fate.

Recently the writer received an envelope with a flattened bird ring inside of it. No information accompanied it and the sender even neglected to write a return address on the envelope. It is a pity, since nothing can be learned from this. The ring is a private one used by bird fanciers, so cannot be traced unless the sender could be contacted for further information. Besides lack of information another common error in returning rings is to place them in an envelope with no protection. This results in the envelope arriving at its destination empty with a small hole at one corner where the ring has worn through. A ring should be flattened, taped to a piece of heavy paper, and mailed with adequate information so that the record may not be lost. Usually less than two per cent of ringed birds are ever heard from again, so each recovered ring is very valuable, adding a little more to our knowledge of birds and their movements, and indirectly to the cause of conservation.

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RHINOCEROS IN MALAYA AND THEIR FUTURE

By

G. T. C. METCALFE

Of the five species of rhinoceros found in the world today two, the Javan or Lesser One-horned Rhinoceros (*Rhinoceros sondaicus*) and the Sumatran Rhinoceros (*Didermoceros sumatrensis*), are, or have been, found in Malaya. The latter still exists in limited numbers, scattered throughout the country, but although it is hoped to find a few of the former still surviving there is no definite evidence so far that they do.

Description

As lack of space prevents full description of all five species, the different characteristics of these animals are compared in Table 1. Both Malayan species are dealt with in greater detail below.

Javan Rhinoceros. The Javan Rhinoceros is larger — five and a half feet at the shoulder has been recorded — than the Sumatran Rhinoceros and cannot easily be mistaken for that species. It only has a single horn compared with two in the latter, though in females this is usually lacking and if present is so small as to be hardly noticeable. The skin which is mosaic-like — similar to that of a crocodile — is brownish grey in colour and hangs in heavy folds on the neck, shoulders and hindquarters. There is a characteristic fold of skin over the neck like a saddle and a fold in front of the shoulder which continues all the way across the back of the neck. Two further folds continue across the back behind the shoulder and in front of the thigh respectively. A further distinctive horizontal fold is found across the thigh and there are heavy folds where the legs emerge from the body. All these folds are distinctive, giving the impression that the animal had been assembled piece by piece, jig-saw fashion.

This animal is known variously to the Malays as *badak tenggiling*, *badak raya*, *badak gajah* and *badak sumbu*, *badak* being the vernacular name for rhinoceros in general though it is also applied to the Malayan Tapir (*Tapirus indicus*).

Sumatran Rhinoceros. The Sumatran rhinoceros is the smallest species of rhino in the world and seldom grows to a height of more than four and a half feet. It is extremely bulky for its size and is two-horned, although the posterior horn especially is usually quite small and not easily noticeable. The skin is rough and granular and there are only three folds, the first being on the neck, the second behind the shoulder and continued across the back and the third just before the

TABLE I—Notes on all five species of Rhinoceros (3)

Scientific Name	Common Name	Number and approximate length of horns	Height at shoulder (approximate)	Distribution
<i>Ceratotherium simus</i>	Square-lipped or White Rhinoceros	Two; anterior up to over 50 inches long	6 ft. (Second largest land animal)	Africa; confined to the Zululand Reserves and small area west of upper Nile
<i>Diceros bicornis</i>	Black or Prehensile-lipped Rhinoceros	Two; anterior up to over 50 inches long	6 ft. (Third largest land animal)	Africa
<i>Rhinoceros unicornis</i>	Great Indian Rhinoceros, Indian Rhinoceros or Great One-horned Rhinoceros	One; up to 24 inches long, average 10 inches	6 ft.	India and Nepal
<i>Rhinoceros sondaicus</i>	Javan or Lesser One-horned Rhinoceros	One; about 10 inches long. Horn of female is either totally lacking or extremely small	5½ ft.	Java and Malaya (?)
<i>Didymoceros sumatrensis</i>	Sumatran Rhinoceros	Two; anterior up to 32 inches long but average usually about 10 inches, posterior horn small	4½ ft.	Burma, Thailand, Malaya, Sumatra, Borneo, Cambodia, Laos and Vietnam

hindquarters. This rhinoceros is more hairy than any of the other species and has been described as being light buff in colour with the tail, the outside of the legs and flanks black and the underparts and lip a pinky flesh colour. From the writer's own observations and those of others who have seen the animal in the wild, the body colour appears to be an overall dirty grey though naturally it is much determined by the mud of the animal's most recent wallow.

There are two vernacular names for this rhinoceros, *badak kerbau*, and *badak himpit*, both of which are widely used, although generally it is just referred to as *badak*. The anterior horn is called *sumbu* in Malay and the posterior *tudong periok* (literally 'cooking pot lid'). Although the horns of dead animals all appear the same in colour, those of living animals are called *sumbu lilin*, *s. api*, *s. nila*, or *s. hitam* meaning wax, flame, blue or black coloured respectively, probably because of their appearance in the half-light of the jungle.

Distribution and Status

Javan Rhinoceros. This species has never been numerous in Malaya, at least not during historic times, and it has never been known to occur to the east of Malaya's main range. During the last two centuries it has only been recorded from the States of Selangor, Perak and Province Wellesley, although the last known record from the latter is of a cow and calf killed one hundred and forty-five years ago, Locke, in 1937, estimated that there were perhaps six Javan rhinos left in Malaya (2). He placed four of these in Perak and two in Selangor. Today it is extremely doubtful if there are any Javan rhinos in the country although sporadic reports of large single-horned animals being seen and tracks measuring over nine inches across being found in south Perak and north Selangor give hope that there may still be a few survivors.

Sumatran Rhinoceros. This species was formerly found throughout the country with the possible exception of the island of Penang. Today scattered remnants are still to be found in all States except Negri Sembilan, Malacca, Province Wellesley and Perlis, and from all information gathered during the last few years, it appears that there now remain in Malaya only about fifty Sumatran rhinos distributed as follows: Johore 10, Kedah 4, Kelantan 5, Pahang 10, Perak 10, Selangor 6 and Trengganu 5. It must be appreciated, however, that it is only a very approximate estimate and the number in fact may be as few as thirty or as many as seventy or more, with the odds on the lower figure.

Persistent persecution of this rhinoceros in the past has driven it into the most inaccessible, uninhabited and usually hilly tracts, with the result that it is extremely difficult to obtain accurate information as to its whereabouts. Serious poaching, however, has now almost died out in Malaya although there are still a few unfortunate incidents of animals being killed or caught — three are on record during the last fourteen years — and a few may have perished at the hands of the Communist Terrorists during the Emergency. On the whole, though, the remaining rhinoceros in the country should survive for many years to come if given a reasonable chance to do so, but this will entail the establishment of conservation methods somewhat different from those practised today.

It has long been necessary for someone to carry out a determined investigation of the rhinos in Malaya, for the Game Department has neither the staff nor the time to devote to this most urgent problem. This need has now been filled by the recent arrival of Mr. Oliver Milton who is currently engaged on a rhinoceros survey. The results of his investigations are eagerly awaited.

Economic Value

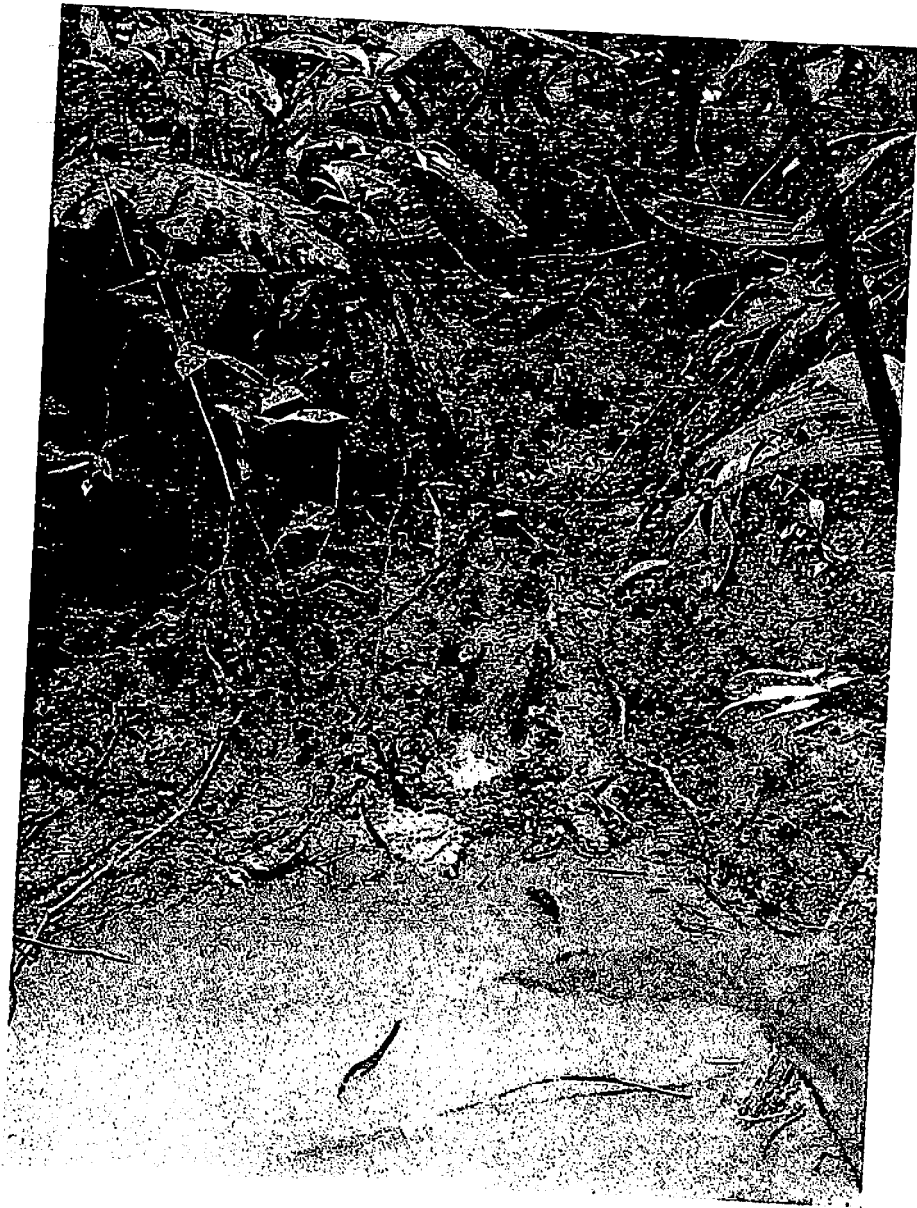
A belief has existed for generations amongst most of the peoples of Asia that all parts of a rhinoceros possess great medicinal value. So strong is this belief that to this day any part of a rhinoceros, but particularly the horn, commands a very high price. The current market value of horn from any species of Asiatic rhinoceros is \$250/- per tahl. The extreme shortage of the genuine article nowadays has even led to the introduction on the market of imitation horns, usually made from buffalo horn. These imitations, many of which are so cleverly carved as to be undetectable except by detailed scientific tests, enter Malaya through Singapore although it is likely that they originate in India. Sold by unscrupulous dealers (usually travelling medicine men), these imitations pass off as the genuine article.

The supposed medicinal value, however, of any part of a rhinoceros is yet to be substantiated and a number of other beliefs relating to the value of the horn as an aphrodisiac and to its nullying effect upon poisons are entirely erroneous. However, whatever the beliefs and whatever the uses of rhinoceros horn, the undisputed fact remains that it is because of the very great demand for and the resultant high value of the horn that these unique beasts are in danger of being exterminated. No rhinoceros is safe as long as these beliefs persist and their complete discredit, through education, seems to be one of the primary steps towards ensuring the continued survival of the species.



P. Bazin (c. Straits Times Press (M) Ltd.)
A young Sumatran Rhinoceros on Lima Belas Estate (North Selangor)
1957.





Footprints of a rhinoceros leaving its wallow.

J. A. Hislop

Ecology

Habitat. The present habitat of the Sumatran Rhinoceros, namely in the inaccessible, densely forested mountain ranges is, the writer considers, one that has been forced upon it by insistent poaching in the past and by the natural advance of civilisation. There are various facts to support this belief and it would seem that those animals found in the Bernam Swamp area of Selangor and another similar area in Johore may be living in their true habitat. The ability of the Sumatran Rhinoceros to adapt itself to almost any type of country has obviously already played an important part in its continued existence and could play an even more vital part in years to come since no particular type of habitat for a Reserve or Sanctuary appears to be essential.

With five exceptions, two of which are doubtful, every known occurrence of the Javan Rhinoceros in Malaya has been in the lowlying and swampy area in the extreme south of Perak and north of Selangor. The true habitat of this species then, in Malaya at least, seems to be low-lying, swampy land with a preference for coastal swamp. It may well be that this obvious preference for coastal swamp has been the main deciding factor in the animal's failure to penetrate further inland from the west coast.

Habits. Little is known of the habits of the Javan Rhinoceros but from what records there are it would appear that they differ little from those of the commoner Sumatran Rhinoceros, to which the following comments refer.

It is an animal of methodical habits and usually feeds during the night although they have been observed in the late evening and early morning. During the daytime it spends most of its time in wallows of which it has a number. These are usually well concealed and in undisturbed areas are used over a considerable period of time.

In normal circumstances the rhinoceros deposits its dung in definite places and on only one occasion has the writer come across rhino droppings other than at these 'deposits'. The latter have always been found on regular routes and situated in shallow streams or on the edge of a swamp. This is clear proof of the animal's methodical habits, for a deposit of such size has obviously been accumulated over a period of several years.

Salt-licks are frequently visited and evidence of these visits over great periods of time is shown by the clearly defined tracks leading to the licks and the deep ruts which have been cut by the passing of the animals for perhaps generations past. A periodic visit to a salt-lick

is a vital necessity to the health of the rhinoceros and it is here that they most frequently have met their death from the poacher's gun. Most natural salt-licks are already known to humans and an essential in any natural conservation programme is the construction of artificial and completely protected licks.

The rhinos found in Malaya are mainly generalised browsers but they also feed on such wild fruits as come their way and occasionally graze some grass. E. C. Foenander has recorded the Sumatran Rhinoceros as eating the leaves of *Pternandra* spp. (sial menaung) and *Crotalaria* spp. (gegiling)(1). To these the writer wishes to add those listed in Table 2. On its wanderings for food a rhinoceros covers about three or four miles in one night although on occasion, especially during the season of *Garcinia forbesii*, a relative of the cultivated mangosteen, it will travel much further. The three-toed tracks which might be found at any height from sea-level to over 5,000 ft. cannot be mistaken for those of any other animal. When feeding saplings are pushed down by sheer force and then the leaves and twigs eaten. There is no evidence to support the belief that saplings are twisted down by use of the horn or that the horn is used for grubbing up roots. The fact that it has no connection with the skull bone belies this belief.

Little at all is known of the breeding habits of either the Javan or the Sumatran Rhinoceros and all enquiries have so far failed to reveal any evidence of calves in recent years. This may indicate lack of breeding owing to dispersion and other disturbance and if this is so then the situation is indeed serious and unless drastic steps are taken early the end is not far distant.

Recommended Conservation Measures

Legislation. All States in Malaya have now accepted the Wild Animals and Birds Protection Ordinance (No. 2 of 1955) which provides a penalty of six months' imprisonment or a fine of \$1,000/- or both for shooting, killing, taking or wounding any rhinoceros for any purpose whatsoever. However, it is questionable if this is an adequate deterrent to a determined poacher in view of the prevailing fantastically high prices for the horn and other parts; in particular, the option of a fine is a weakness. Moreover, this Ordinance leaves a loophole in that 'totally protected' animals, such as the rhinoceros, may be killed in defence of life or property. Unprovoked a rhinoceros will not endanger humans or damage their cultivations and consideration might therefore be given to making the protection of such animals absolute, with provision that only the Game Department could destroy proven dangerous rogues.

TABLE 2—Food plants of *Didemnoceros sumatrensis*

Scientific Name	Common Name	Vernacular Name	
<i>Artocarpus elasticus</i>	<i>Terap</i>	Tempunai, Tempuni, Gins (Perak), Jelatoh (Kedah), Perian (Pahang)	Leaves
<i>Artocarpus rigidus</i>	Monkey Jack		Fruits
<i>Chrysophyllum</i> sp.	Star apple, Caimito	Lampin Budak, Lamping Budak	Fruits
<i>Claoxylon indicum</i>	—	Salang, Sanglong	Leaves
<i>Claoxylon longifolium</i>	—		Leaves
<i>Dissochaeta gracilis</i>	—		Leaves
<i>Endospermum malaccense</i>	Moon tree	Bulan Bulan, Bebulan, Membulan, Sendok, Sendok Sendok, Sesendok	Leaves
<i>Evodia pilulifera</i>	—		Leaves
<i>Ficus alba</i>	White-leaved Fig	Ara	Leaves
<i>Ficus aurata</i>	—	Ara	Leaves
<i>Ficus bengalensis</i>	Indian Banyan	Ara	Leaves
<i>Ficus fistulosa</i>	Common Yellow Stem-fig	Ara	Leaves
<i>Ficus glandulifera</i>	Gaping Fig	Ara	Leaves
<i>Flacourtia indica</i>	Lesser <i>Krekup</i>	Krekup	Leaves
<i>Garcinia eugeniaefolia</i>	—	Kandis	Leaves
<i>Garcinia forbesii</i>	Rose-Kandis	Kandis	Fruits
<i>Macaranga</i> spp.	<i>Mahang</i>	Mahang, Meseapat, Melokan, Kubin, Tapu, Setapu, Mehe	Leaves
<i>Mallotus paniculatus</i>	Turn-in-the-Wind	Balck Angin	Leaves
<i>Mezettia leptopoda</i>	—	Mempisang, Pisang-pisang	Fruits
<i>Milletia sericea</i>	—		Leaves
<i>Mussaenda villosa</i>	—		Leaves
<i>Pouteria mangayi</i>	—		Fruits
<i>Symplocos fasciculata</i>	—		Leaves
<i>Zizyphus calophylla</i>	Alum Tree	Menasi, Nasi Nasi, Nenasi	Fruits
			Leaves

i. Taken from 'Wayside trees of Malaya' by E. J. H. Corner: Government Printer, Singapore, 1952 (2nd Edition).

Since the destruction of the rapidly declining rhinoceros population is entirely to obtain parts for their supposed medicinal properties, a ban on the import, export and possession of all rhinoceros parts, especially the horn, which cannot be positively identified and proved to be covered by a specific certificate from the Game Department (or its equivalent) in the country of origin, would do much to stop the illegal killing of animals, not only in Malaya but elsewhere. Provision could also be made for a more positive method of registration of all existing material than is now employed. Strong measures of this nature are essential if the rhinoceros is to be saved from its present position of near extinction.

Education. For any law to be fully effective it is essential that the reason for its existence is clearly understood and thoroughly appreciated by the people most directly concerned. Failure to understand leads to resentment and a law which is resented by the public can never fulfil its intended purpose. Unfortunately the Game Laws in Malaya are little understood by the general public any more than is the need for preservation of the rhinoceros. It is, therefore, essential that steps should be taken at an early date to bring home to the people the precarious position of the rhinoceros, with special emphasis being paid to the cause of its plight—the mythical medicinal properties with which it is credited.

A possible way to do this is by means of a country wide publicity campaign through such media as cinema screens, loud-speaker vans, newspapers, posters the radio, lectures, pictorial stamps and postal franks. Public interest once aroused should be maintained and this could be done by published progress reports of wild life surveys conducted by the Game Department and others.

Reserves. Very few rhinoceros in Malaya are found within the confines of the existing Game Reserves, but whether or not they have been any the worse off because of this is very doubtful for none of these reserves, with the exception of the National Park, have any resident staff and unfortunately in none of them is effective control possible because of shortage of staff. However with the rapid advance of civilisation and its attendant encroachment upon many of the last remaining haunts of our rhinoceros population, it is imperative that a few new reserves are created at an early date. It is essential though that reserves for threatened species be extensive — more than sufficient to allow for the free normal movement of the animals — and adequately staffed to afford effective protection. It is equally essential that as many as possible of the dwindling and isolated rhinoceros population, usually in numbers inadequate to breed, be captured and then released in the National Park

or other Game Reserve. This would serve the dual purpose of better ensuring their survival from poachers and at the same time considerably enhance their chances of breeding. A pre-requisite of this is an immediate detailed ecological survey of the rhinoceros on a country wide basis.

There are problems to be surmounted, but these should not be impossible if all will support these efforts to save, for the benefit of future generations, some of the most harmless but distinctive of our wild life.

Acknowledgement

The writer would like to express his grateful thanks to all those persons who have answered his various appeals for information.

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