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endemic palm *Pritchardia beccariana*, and it was expected that this forest, the last good one in this island, would be left untouched. However, I learnt to my surprise that this forest now was the site of a prison camp, called Kulani, and that the koa was going to be cut on a large scale in order to create a profitable territorial lumber industry. Whether this unfortunate scheme includes reforestation with koa, I do not know. Anyhow, the supply will soon be exhausted. I visited the place, where large clearings had been made and the camp was in full swing. A motor road leading to the camp, which is closed to visitors not holding permission to enter, had been constructed and extended through the forest as far as to the 1942 lava flow. Once disturbed, the forest will soon become invaded by foreign elements, and the natural undergrowth, exposed to light, cannot persist. I doubt that this region has even been thoroughly explored by an expert botanist. I got the impression that the whole scheme was strongly disapproved by the forestry people, but they were unable to stop it. It is a hard blow to nature protection in the islands.

NATURE PROTECTION IN THE INDONESIAN ARCHIPELAGO
(NETHERLANDS INDIES)

By A. Hoogerwerf, Member of the Council of the Society for
Nature Protection in the Netherlands Indies

1. *Introduction.* (Something about the past of our movement in the Netherlands Indies and some hopes for the future). Although in the early part of 1900 Government regulations came into force to protect certain animals and to limit game-hunting in this Archipelago, it may be pointed out that not until 1912 did the foundation of the Netherlands Indian Association for Nature Protection induce the authorities to pay more attention to the cultural duty they had to fulfil on behalf of matters connected with Nature Protection and Game-Hunting.

This Association was established at Buitenzorg and counted among its members prominent citizens of this country, among whom were several biologists of standing, and had as a member of its Council the Director of the Botanic Gardens. Owing to the last fact this scientific institution was more or less the centre of the activities in this domain during the whole history of the movement of Nature Protection in the Netherlands Indies.

Immediately after its establishment this association proposed to the Government the composition of a series of new laws regarding protection of nature, through which it became possible to keep certain areas of zoological, botanical, geological or aesthetic importance untouched and to protect certain species of animals. This shows that the pioneer work in our Archipelago in this respect has been done principally by this private association, which during its whole existence enjoyed the moral support and co-operation of the authorities, with the Governor-General of the Netherlands Indies as its patron. In later years it also co-operated with the Netherlands Committee for International Nature Protection — with its well-known chairman Dr. P. van Tienhoven—and kept up relations with many sister societies abroad. The annual reports of the association bear witness of its important work on behalf of the protection of nature in the Netherlands Indies.

About the year 1930 the work concerning the preservation of nature had become so extensive that the authorities deemed it necessary to make the whole movement a Government matter. They charged the Director of the Botanic Gardens—in addition to his own functions—with this work and with a large part of matters pertaining to game-laws.

However, it soon became impossible for this functionary to carry out so great a task, with the result that, in 1935, a special official had to be appointed, who in the same year was put at the disposal of the Director of the Botanic Gardens. He was the first official to work in this branch exclusively, and up to 1947 he remained alone. In 1947, however, the situation improved, after the proposals of the Director of the Botanic Gardens, Prof. Dr. L. G. M. Baas Becking, were accepted, and two more specialists may be appointed, viz. one botanist and one game-warden.

The total area of the reserved territories in the whole Archipelago amounted at that period to about 1,500,000 ha., with more than 120 different objects. For Java only this area was about 122,000 ha., consisting of about 70 preserves, enlarged by more than 50,000 ha. at the beginning of the Pacific War.

When making laws to protect the treasures of Nature in this unique Archipelago, much attention was paid to the protection of certain species of animals, such as rhino, orang-utan, tapir, hogdeer, elephant, Komodo monitor, birds of paradise, etc., etc., which may not be killed, caught or exported without a special licence. The export of all living mammals in numbers greater than two specimens and of more than five birds at a time is also prohibited. In case of damage to plantations by protected animals or by so-called "game", special licences may be granted for killing or catching.

The importance of game-hunting in Java before the war may be shown by the fact that more than 60,000 hunting-rifles were in circulation and that every year about 9,000 licences were bought, with a revenue of about 850,000 Dutch guilders.

Unfortunately, however, only a very small part of this amount could be spent for matters concerning nature protection or the protection of our game, especially our big game, as will be shown below.

Maintenance and supervision of all Fauna- and Nature-Reserves in this Archipelago fall under the Forestry Service as these areas lie either within the permanent forest reserves or in other places directly under the jurisdiction of this Service. It was natural and efficient to entrust the care for these preserved areas to the foresters.

The Forestry Service was charged by a Government decree ("Ordonnantie") with the control of the reserves, which implied that adequate measures were to be taken by this Service to prevent destruction of or damage to protected areas, and their maintenance in the best possible way. If it is realized—as pointed out above—that the protected territories in Java occupy in total an area of about 175,000 ha. (440,000 acres) divided over about 70 different sites and situated all over the island, it needs no explanation that a satisfactory supervision involves a rather extensive organization. A staff of trained men and a certain amount of money are essential.

Notwithstanding these obvious requirements, the Forestry Service has never established an office or division for Nature Protection and the total amount of funds granted before the outbreak of the war was

undeniably too low. The protection of nature received therefore too little attention, which in my opinion was due more to the policy followed by the Government than to neglect by the Head of the Forestry Service. However, this is of no immediate concern.

As regards the Department of Civil Affairs which had to look after the control of all regulations beyond the powers of the Forest Department, the situation was similar, with the result that the laws remained dead scraps of paper with scarcely any practical effect.

The voice of the officer for Nature Protection was advisory only, not authoritative and, in practice, the Director of the Botanic Gardens could have no real influence upon the line of action (or non-activity!) followed by the Forestry Service and the other authorities.

It is essential to understand that the Director of the Botanic Gardens at Buitenzorg, the centre of scientific research in this Archipelago, who is assisted by a staff of specialists in the field of Natural Sciences, is one of the very few authorities who can judge the desirability of preservation of certain areas and of protection of certain species of animals. He receives direct and competent advice as to the best way of maintaining the perishable treasures of nature, now rapidly disappearing before the ever-extending cultivation. It is a pity, in the opinion of everybody interested in this field of science, that this authority has not more influence in the development of the protection of nature than up to the present time.

It is evident that a policy as outlined above could never yield favourable results, all the more as no funds were granted to the Botanic Gardens to be spent on this matter wherever the Forestry Service failed through lack of funds.

This situation roused considerable opposition in circles concerned with Nature Protection: among the members of the Netherlands Committee for International Protection of Nature, the Netherlands Indian Association for Nature Protection, the Botanic Gardens, etc.

The character of the Forestry Service in this Archipelago is economic; it is bound to follow a policy of economic profit in the first place, whereas the protection of nature aims at scientific and, in general, non-economic interests: leading principles for the preservation of the treasures of nature for posterity.

An increase of authority for the Director of the Botanic Gardens is urgently and badly required in order to improve this situation. It seems to be the keystone of any effective organization.

The central office which should carry this authority logically belongs not in the Forestry Service, but should be entirely in the hands of the Botanic Gardens, while in the future it even might be entrusted to a special department with its own personnel and budget.

One might be inclined to believe that no revenues make good the money spent in the protection of nature, and short-sighted persons have thought that expenses on behalf of Nature Protection are wasted money. This is erroneous.

Under normal circumstances—which, however, have not been established yet in this Archipelago—the revenue received from licences for fire-arms, hunting licences, etc., are approximately 850,000 florins annually. This amount would be sufficient to cover all costs involved in a good Service for the Protection of Nature and such protection is

essential if any hunting, exportation of animals, etc., is in future desired. This simple truth has never been seriously considered by the highest authorities in this country. The difference between the large revenues from hunting licences and the scanty expenditure for Nature Protection is a constant annoyance, in spite of the fact that game hunting and catching of protected animals (with a licence) in the territories beyond Java are free of any cost, even the export not being charged for.

I have tried to demonstrate above that the revenues to be expected from hunting licences, export permits, etc., will cover all expenditure now required to maintain Nature Protection. But, if any revenue may be expected in the future at all, it is necessary to guard the existing Reserves and to look seriously after our game and rare species of birds and animals. This should be done quickly and thoroughly, to stop poaching by the native population and provide for other unaccountable influences tending towards the exterminating of all kinds of game and of useful vegetation.

I need not explain here the importance of the Fauna- and Nature-Reserves from a scientific point of view. Especially after a war, which annihilated so many irreplaceable objects of beauty or interest, we must realize that these aspects of nature should be protected as a matter of duty for later generations.

When the protection of nature in the Indonesian Archipelago is—and it must be—reorganized, the Director of the Botanic Gardens or the Head of the proposed organization of Natural Sciences should have an important say in the following:

- (a) To grant and to determine the funds to be spent for nature protection;
- (b) the best way of spending the funds;
- (c) the selection of personnel to be employed;
- (d) the work to be carried out.

I have spoken above of a planned organization of Natural Sciences, because since the war proposals have been made to found Scientific Research, whether pure or applied, and it has also been suggested that this organization should include matters concerning Nature Protection, Game Hunting Regulations, etc., etc., which would be entrusted to a special division.

If these projects could be realized, this would mean considerable progress, not only because in this case all interests concerning Nature Protection would be put into "one hand", but also because in this way it might be possible to *prevent these important matters being entrusted to the Governments of the different, more or less independent States*, into which the Netherlands Indies will be broken up in the future. Regarding the very important economic and other problems which must be solved by these States, we may be assured that Nature Protection will not occur in their working programme for many years to come.

When finally there is time to pay attention to the preservation of the unique flora and fauna of the Indonesian Archipelago it might be too late in many respects. During more than two miserable years after the Japanese capitulation, I myself had the opportunity to see how astoundingly quickly plants and animals are pushed back or destroyed

by so dense a population as that of Java. In the Indonesian Archipelago there is "periculum in mora" and I appeal to all who are interested in international Nature Protection, in particular the newly established "Union Internationale pour la Protection de la Nature", to help the handful of enthusiasts in that part of the world.

2. *Nature Protection during the Japanese Occupation (1942-1945) and after that Period.* The Dutch official for Nature Protection, A. Hoogerwerf, resumed work in April, 1942, but he was removed to the ornithological section of the Zoological Museum in February, 1944, and therefore his activities on behalf of Nature Protection were restricted to a minimum. The work had to be limited to Java only, as no contact with the other islands could be obtained. With a lot of trouble some excursions could be made, but this stopped altogether after August, 1943. The Rhino Reserve, Ujung Kulon and the Nature Reserves, Pulau Duwa, Tjibodas Mt. Gede and Depok were visited. Ujung Kulon was inspected in September-October, 1942, and for the second and last time in January, 1943. In September this Fauna Reserve and its game seemed to be safe, but there was hardly any personnel left and guarding was done very insufficiently. After this visit more funds were put at the disposal of the Bantam forester as a result of which in January, 1943, things were improving, the guarding was again satisfactory, and activities on new pastures had started again. During the whole Japanese occupation the guards remained at their posts and reports were favourable. It appeared that the Nature Reserve Pulau Duwa was deprived of its taller vegetation, which made it impossible for the heron- and stork-like birds to nest here. Guards were appointed again and some months later prospects seemed already much better. In this reserve, too, the guards stayed till the Japanese capitulated. The Nature Reserve Depok was only little damaged and the newly appointed guard remained on his post during all the war years. It was only *after* the Japanese capitulation that this reserve was very heavily damaged and nearly deprived of all its big, very old trees.

The Nature Reserve Tjibodas Mt. Gede was slightly damaged, but in general it remained in good condition during the whole occupation.

About some other reserved areas, e.g. Mt. Papandajan, Tangkoeban Prahoe-Pelaboehan Ratoe unfavourable reports reached our office, from which it became evident that these territories had been heavily damaged.

The many attempts to get the private Reserve Tjikepoeh under Government control failed, and owing to this the big game there may have been nearly or entirely exterminated.

From Central- and East-Java only few reports came in.

The Yang Highland had been guarded by Mr. Ledeboer Sr. himself and after his internment (during which he died) by his son, probably until Japan's capitulation. Some thousands of deer were shot there on behalf of the Japanese army, although this is of only small importance considering the big deer supply in this private reserve. The Fauna Reserve Baluran kept its guards during the whole occupation. In June, 1944, the number of bantengs (wild oxen) was estimated at about 500, the deer at 200. The waterholes for the game were cleaned and deepened in 1943. Favourable reports arrived from the Nature Reserve Ardjuna Lalidjiwo, where the game-supply was said to improve.

All efforts to induce the authorities to take measures against poaching, which seemed easily to be possible with a Police organization such as the Kempetai (Japanese Gestapo), had none or only a very small result. It was, however, a favourable circumstance that nobody, except members of the army and some other private Japanese, was permitted to have a gun or other firearms. But everyone knows that in this country a poacher—even without a gun—can easily succeed in laying hands on any wild animal which he wants for food. It may be expected that the game beyond the reserves has badly suffered as a result of intensive poaching and probably this is also the case—perhaps to a smaller degree—with the game within the reserved areas.

One shudders at the very thought of poachers entering our Fauna Reserve with modern automatic guns. . . . Or at the probable results of the fact that the "terrorists" believe that certain parts of a rhino give invulnerability to the bearer (so-called Djimat). We can only be extremely pessimistic about the position of our game and our last specimens of *Rhinoceros sondaicus*, as we are still not able to visit this reserve, and nearly all other reserved areas, owing to the chaotic situation still prevailing.

3. List of Fauna- and Nature-Reserves in the Indonesian Archipelago.

Number	Name	Situated in	District	Area in ha.
1	Prinsen-Eiland	West-Java	Pandeglang	17,500
2	Udjung-Kulon	"	"	37,500
3	Pulau-Duwa	"	Serang	8
4	Danoe-lake	"	"	2,500
5	Tjikepoeh	"	Soekaboemi	10,000
6	Klein Kombuis	"	Batavia	18
7	Depok	"	Buitenzorg	6
8	Angkeh	"	Batavia	15
9	Poelau-Ramboet (Middelburg)	"	"	20
10	Artjadomas	"	Tjiandjoer	2
11	Takoeh	"	Soekaboemi	50
12	Tangkoebanprahoe-Palaboehanratoe	"	"	22
13	Soekawajana-Palaboehanratoe	"	"	33
14	Tjadas-Malang	"	"	21
15	Tjimoengkat	"	Tjiandjoer	56
16	Tjibodas (Mt. Gedeh)	"	"	1,040
17	Tjibanteng	"	"	447
18	Doengoes-Iwoel	"	Soekaboemi	9
19	Malabar	"	Bandoeng	5.8
20	Junghuhn-Monument	"	"	?
21	Tjigenteng-Tjipanje I/II	"	"	2 and 8
22	Tomo	"	Soemedang	1
23	Koorders Monument (Pendjaloe)	"	Tjiamis	16
24	Telaga-Patengan	"	Bandoeng	150
25	Papandajan-crater	"	"	844
26	Telaga-Bodas	"	Garoet	285
27	Penandjoeng (Pangandaran)	"	"	457
28	Peson-Soebah I/II	Central-Java	Batang	each 10
29	Oeloelanang-Ketjoeboeng	"	"	71
30	Goetji	"	Pekalongan	?
31	Telaga-Randjeng	"	"	?
32	Moga	"	"	?
33	Tjoeroeg-Bengwawah	"	"	?
34	Getas	"	Semarang	?
35	Geboengan (Mt. Oengaran)	"	Salatiga	1.8
36	Sepakoeng (Mt. Telamojo)	"	"	2.5
37	Pagerwoenoeng-Daroepana	"	Kendal	30

Number	Name	Situated in	District	Area in ha.
38	Tjabak I/II	"	Toeban	3 and 9
39	Keling I/III	"	Rembang	60
40	North-Noesa-Kambangan I/II	"	Tjilatjap	293
41	East-Noesa-Kambangan	"	"	277
42	Diëng Plateau	"	Bandjarnegoro	85
43	Pringombo I/II	"	Magelang	12 and 46
44	Nglirip-grotto	"	Bodjonegoro	?
45	Mt. Pitjis	East-Java	Ponorogo	32
46	Mt. Sigogor	"	"	200
47	Klangoen-Saraden	"	Madioen	5 and 1
48	Besowo-Gadoengan	"	Kediri	7
49	Manggis-Gadoengan	"	"	12
50	Tenger-Sandsea	"	Malang	5,250
51	Ranoe-Koembolo	"	"	1,342
52	Ranoe-Pani-Regoeloe	"	"	96
53	Ardjoeno-Lalidjiwo	"	"	580
54	Mt. Abang	"	Pasoeroean	50
55	Danau-Darangan	"	Loemadjang	380
56	Poeloe-Sempoe	"	Malang	877
57	Soengi-Kolboe	"	Bondowoso	9
58	Wetangan-Poeger I/IV	"	Djember	each 2-4
59	Tjoromanis-Sempolan I/VIII	"	Banjoewangi	each 2
60	Rogodjampi I/II	"	"	17 and 8·5
61	Pantjoer-Idjen I/II	"	"	4
62	Tjeding	East-Java	Bondowoso	2
63	Noesa-Baroeng	"	Djember	6,100
64	South-Banjoewangi	"	Banjoewangi	62,000
65	Kawah-Idjen	"	Bondowoso	2,560
66	Saobi (Kangean)	"	Pamekasan	430
67	Baloeran	"	Sitoebondondo	25,000
68	Bawean (Poelau-Noko and -Noesa)	"	Soerabaja	15
			Total area	176,801·6

SUMATRA

1	Rafflesia-Reserve Atjeh I/II	North-Sumatra	Atjeh	?
2	Mt. Löser	"	"	416,500
3	Wilhelmina-chaine	"	Langkat	200,000
4	Dolok-Saoet	Central-Sumatra	Tapanoeli	39
5	Baringin-Sati	Sum. Westcoast	Pandang Pandjang	0·01
6	Anai-Crevice	"	"	211
7	Peak of Indrapoera (Kerintji)	"	Solok-Kerintji	12,500
8	Batang-Paloepeoh	"	Agam	3·40
9	Rimbopanti	"	"	3,500
10	Harau-Crevice	"	Pajakoemboeh	298
11	Sibolangit	Sum. Eastcoast	Deli	115
12	Dolok-Tinggiradja	"	Simeloengoen	167
13	Batoe-Gadjah	"	"	
14	Lau-Deboek-Deboek	"	Karoo Highland	7
15	Batoe-Ginoerit	"	Bilah	0·50
16	Rafflesia-Reserves I/III	South-Sumatra	Benkoelen	71
17	Rafflesia-Reserves, Despetah I/II	"	"	0·31
18	Rafflesia-Reserves, Tjawang I/II	"	"	0·20
19	Doesoen-Besar	"	"	12
20	South-Sumatra	"	Benkoelen/ Lampongs	356,800
21	Krakatau and Verlaten Niland	"	Lampongs	2,500
22	Way-Kambas	"	"	130,000
23	Oeloe-Tiangko-grotto	"	Djambi	?
24	Berbak	"	"	190,000
25	Boengamas-Kikim	"	Palembang	1
			Total area	1,312,756·42

Number	Name	Situated in	District	Area in ha.
BORNEO				
1	Mandor	West-Borneo	Mandor	195
2	Lo-Pat-Foen-Pi	"	Singkawang	8
3	Mt. Paloeng	"	Simpang	30,000
4	Padang-Loewai	South-east Borneo	Koetei	1,000
5	Koetei	"	"	306,000
6	Kotawaringin	"	Kotawaringin	100,000
7	Sampit	"	Sampit	205,000
Total area				642,283

CELEBES				
1	G. Lokon	North-Celebes	Menado	100
2	G. Tangkoko-Datoe-angoes	"	"	4,446
3	Tanggala	"	"	125
4	Panoea	"	Corontalo	1,500
5	Mas-Popaja-Radja	"	"	160
6	Bantimoeroeng	South-Celebes	Makassar	10
7	Nopabalano (Moena)	"	Nopabalano	9
Total area				6,350

OTHER ISLANDS				
1	Sangehh	Bali	Badoeng	9.8
2	Mt. Rindjani	Central Lombok	Bajan	40,000
3	Padar-Rintjah	Timor	Manggarai	?
4	Mt. Api	Moluccas	Island Gn. Api, Banda-sea	?
5	Rumphius-Monument	"	Amboina	2.5
6	Lorentz	"	New Guinea	320,000
Total area				360,012.3

TOTAL NUMBER AND AREA OF THE FAUNA- AND NATURE-RESERVES
IN THE INDONESIAN ARCHIPELAGO.

	Number of objects	Area
Java	68	more than 176,800 ha
Sumatra	25	more than 1,312,756 ha
Borneo	7	about 642,283 ha
Celebes	7	about 6,350 ha
Other islands	6	more than 360,012 ha
Total:	113	more than 2,498,201 ha

4. *Review of all Regulations concerning Nature Protection and Game Hunting.*

A. Nature Protection

1. Wild Animal Protection Ordinance 1931 (protection of wild animals and birds).
2. Regulations in virtue of the Articles I and 3 (Paragraph 3) of the Wild Animal Protection Ordinance 1931.
3. Nature Protection Decree 1941 (regulations concerning Fauna- and Nature-Reserves).

B. Game Hunting

1. Hunting Ordinance for Java and Madura 1940.

2. Hunting Regulations Java and Madura 1940, to carry into execution the Hunting Ordinance 1940.
5. *Regulations About to come into Force when the Pacific War Broke Out*

The following Ordinances and executive Regulations were ready to be presented to the Government of the Netherlands Indies when the Pacific War broke out.

1. Fauna Protection Ordinance valid for the whole Archipelago.
 - 1a. Regulations to carry into execution this Ordinance.
 2. Hunting Ordinance for the territories outside the islands of Java and Madura.
 - 2a. Regulations to carry into execution this Ordinance.

With the coming into force of these new laws the "Wild Animal Protection Ordinance and Regulations 1931" (as mentioned above) would expire.

NEW ZEALAND

Dr. H. H. Allan, Wellington, has kindly submitted for publication the following report on areas created scenic or historic reserves during the period 1938-1947.

1938. 61,868 acres. In addition, two private scenic reserves, 519 acres. Additions made to Bream Head Reserve at the entrance to Whangarei Harbour. Rock Pinnacles of Manaia were declared a reservation. A scenic reserve was established along the Kireterere-Awakino Road. At Lake Rotoma 484 acres of dense forest were set aside. Various small forest and mountain areas in North Island were also reserved.

In South Island 28,200 acres in the Lewis Pass area, Nelson Land District, and 3,396 acres along Arnold River, Lake Brunner, Westland. There is now a chain of reserves round Lake Wapaho, Westland. Some 1,147 acres were added to the reserves near the Fox Glacier, and a number of smaller reserves were established in various parts of South Island.

1939. 16,905 acres.—Near Awakino, North Island, 382 acres of forest. Some 10 acres added to Trounson Kauri Park. On the Kaimai Ranges, Auckland, 4,490 acres of forest. Additions were made to the Huiarau Reserve, Gisborne Land District. The whole of the old Maori fighting pas are now included. A number of forest areas along roads in South Island, including areas in the Marlborough Sounds.

1940. 5,951 acres.—A number of areas, mainly forested, were reserved in both islands. An area of 88 acres surrounding Shakespeare Cliff, Cook's Bay, Coromandel Peninsula, was proclaimed a reserve, being the site of Captain Cook's observation of the transit of Mercury. Further areas were reserved in the Marlborough Sounds, totalling 1,200 acres. The area surrounding the Opiti Blowhole at Jack's Bay, Otago. Major P. H. Johnston set aside a forest area of over 200 acres on his estate at Raincliff, South Canterbury, as a memorial to the pioneers, to be called "Raincliff Pioneer Park". The dominant tree is the kahikatea, *Podocarpus dacrydioides*.

1941. 16,184 acres.—Reservation was completed over 653 acres on Great Barrier Island, including kauri and mixed forest. An area of 13 acres in the Petone Borough, Wellington, was reserved to preserve