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PRESERVATION OF WILD LIFE AND NATURE RESERVES IN THE NETHERLANDS INDIES

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BY

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Chairman of the Netherlands-Indian Society for the Protection of Nature.

"We no longer destroy great works of art. They are treasured, and regarded as of priceless value; but we have yet to attain the state of civilization where the destruction of a glorious work of Nature, wether it be a cliff, a forest or a species of mammal or bird, is regarded with equal abhorrence".

H. F. OSBORN in HORNADAY
"Our Vanishing Wild Life".

I. PRESERVATION OF WILD LIFE.

Preservation of wild life includes the protection of wild plants and animals as well as that of natural landscapes. The protection mentioned first is of a more general kind than the second, as it is not restricted to a definite area or region. Therefore, we will first speak about the protection of wild plants and animals. The protection of natural landscapes, in other words, the preservation of nature reserves, truly very often aims at preserving plants and animals in their natural abodes and surroundings, but it may also only mean the preservation of the soil and nothing further. We will return to this later on.

In the Netherlands Indies so far no regulations exist for the protection of certain species of plants from the danger of extermination; the only way by which plants here can be saved is by turning their natural habitat into a nature reserve. As for palaeontological and prehistorical findings an enactment is being prepared by which the export of such findings will be subjected to certain restrictions.

It is otherwise with the animal world; for the first time in 1909 regulations were made which aimed at the protection of wild animals. This ordinance which was enforced on January 1, 1910 was based on the thesis that all the species of animals that should be protected by law could not possibly be enumerated by name. Therefore all wild mammals and birds were included in these regulations, with the exception of a number of species to be indicated by the governor-general.

These exceptions in the first place related to species for which the prohibition to capture and kill was entirely abolished, and in the second place to species regarding which the Heads of the Provincial Authorities had the power to abolish entirely or partly the prohibitive regulations. The first category included the animals that in general were considered harmful, but amongst these, for instance, were included all monkeys, also the orang utan, all kingfishers, barbets and bulbuls and different kinds of gamebirds, such as pigeons, fowls and water-game.

In the second category were classed the real game and besides the so-called big game, also parrots and birds of paradise.

In practice this whole ordinance actually remained a dead letter; the local authorities generally disposed of the matter by simply abolishing the whole prohibition for the above mentioned species, which could be considered as game, so that they became classed amongst the absolute free kinds. And as for the protected species, here the law aimed too high, as the total protection of all mammals and birds — with the exception of game and harmful animals — must be the final purpose not the beginning of the law, for, in a tropical country with its very inefficient police-supervision in remote regions, there can be no question of total protection of all mammals and birds, with the exception of a few.

So the actual protection of many species of animals remained quite unsatisfactory. The practically unlimited hunting of almost all species, which according to the ordinance of 1909 were excluded from protection, and the persecution to which also many protected kinds remained exposed, made a revisal of the existing regulations very urgent. And so in 1924 a new ordinance was enacted which was based on a principle somewhat opposite to that of the ordinance of 1909. The system by which all

mammals and birds, excepting a few kinds mentioned by name, were protected, was abandoned; now the species to be protected had to be specified by name, while in this same ordinance also the hunting was restricted by definite rules, from which there could be no getting away.

As mentioned before, a total protection of mammals and birds must be considered premature; with the primitive conditions which mostly prevail in a tropical country such a protection cannot be made effective yet. Besides, there are many kinds of mammals and birds of which the preservation is by no means threatened and the extermination of which, for the time being, need not be feared, while a protection carried too far — if really the regulations are observed — causes unnecessary annoyance to the population.

Thus the ordinance of 1924 broke for good with the system of 1909 and the protected species were individually enumerated. The list contained not less than 61 species or groups of species to which the prohibition to hunt and kill refered. In this enumeration not only species which were really exposed to persecution were classed but also all kinds of animals considered as useful, such as many insect-eating mammals and birds.

By the provisions of this ordinance for the first time the game-hunting — at least for Java — was limited to a few months a year, which period varied according to the kinds of game. Now also for the first time hunting-licenses were introduced, the costs of which varied between ten and two hundred guilders. This new ordinance, for the time being, came only into force for Java and Madura; for the other islands its enactment was generally considered inexpedient, because the authorities judged such an intensive hunting-regulation, as proposed here, on the whole impracticable for the islands outside Java. And so the old unsatisfactory regulations of 1909 remained maintained for those regions. So one of the principal objections against the new ordinance became evident, namely the combination of regulations concerning actual hunting with those of animal protection. Because the enactment of such an intensive hunting-regulation was not considered advisable for the

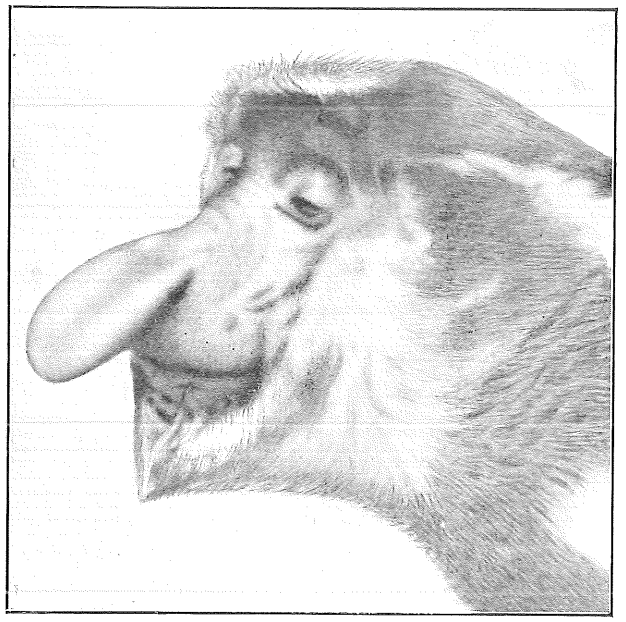
territory outside Java and Madura, a better regulation for the protection of many wild animals also remained in abeyance.

Another drawback of this last ordinance was that by this law the export of protected species and of their skins of other parts of their body was not positively forbidden. Actually there could be no question of export of these kinds because the ordinance mentioned also forbids the possession of the protected species. But as there were no special instructions concerning the export, the custom officers let through unhindered all protected kinds or their skins. The absence in this ordinance of a regulation prohibiting the export of protected animals, and the mistake of combining in one ordinance regulations concerning hunting and animal protection, had the effect that the ordinance of 1924 really very soon had to be considered as impracticable and not conclusive. Shortly after the enforcement, the introduction of new and better regulations had to be considered. This happened by two recently drafted enactments (see Appendix) which probably will be enforced in 1929.

First of all we have to notice that in these drafts the various provisions are given partly in enactments and partly in executive regulations as demanded by the new Dutch East Indian constitution. The enactments namely which include the main principles, first have to be sanctioned by the Netherlands Indian Parliament (Volksraad), the executive regulations are issued by the governor-general, who also has the authority to modify them without consulting the "Volksraad".

With these new provisions hunting and animal protection were distinctly separated. A more intensive hunting regulation over the whole territory of the Netherlands Indies, for the present, is as little practicable as a uniform regulation. Here we need local rules. The new game-enactment for the present will only have effect for Java and Madura but can, if necessary, be enforced for the other districts.

The enactment for the protection of wild animals chiefly aims at the preservation of those species of animals, that are exposed to persecution unnecessarily or for commercial purposes. Therefore it has to be in force for the entire Netherlands Indies, for, if some districts were excepted, commerce would immediately fling itself upon these, while effective supervision would be much more difficult if the whole territory was not submitted to the same regulation. With these new regulations it is not only forbidden to capture and kill but also to sell or to possess the animals concerned. A good point in this enactment too, is the positive prohibition of export because this prohibition is one of the strongest weapons we have against trade in animals or animal products. Here a strict enforcement of the regulation is quite feasable, also in those regions where the observance of the prohibitive provisions to capture, hunt or kill can hardly be controlled. In the most remote places, where export of any importance takes place, there are custom officers who



From "Krause, Borneo"

Fig. 1. Head of the Proboscis Monkey; a protected species.

can see to it that the prohibition is observed. Not only the export of the animals themselves, mentioned in the regulations, is forbidden but also that of their skins or other parts of their body and even of the products and articles made from these. The latter is stipulated in order

to prevent the industry from being transferred to this country, so that, notwithstanding the regulations, an important export trade could be carried on in articles made from products forbidden for export. So, for instance, a prohibition for export of Varanus skins would be of little use if the export of articles made from them was allowed.

Exemption from these prohibitive regulations can only be granted for scientific or educational purposes.

Besides the animals which are important to trade, the new enactment protects a number of other species. The list of the protected kinds has shrunk considerably compared to that of the ordinance of 1924; it now contains only those animals that are threatened by extermination and so really urgently need protection, and those, whose preservation is desired for the sake of science or for other reasons of general importance.

When we examine this list of the protected kinds (see the regulations for the protection of wild animals, Appendix II), we notice in the first place that a number of monkeys and lemurs, which are exposed to persecution for the sake of scientific research are protected. The so-called man-like apes, such as orang utans and gibbons often are victims of unnescessary experiments. Also precautions have to be taken against the passion of many musea, to collect of rare animals as much material as possible, and also measures have to be adopted against the hunters of embryos who for the sake of scientific research kill hundreds of females of one species — sometimes males too, if the sexes are hard to distinguish — for the purpose of finding in a few specimens a foetus in the desired stage.

Especially the orang utan (Fig. 2) has been exposed to persecution of late years. The increasing demand for this remarkable man-ape, confined to North Sumatra and Borneo, for zoological gardens or institutions that use the animals for transplantation experiments, made a restriction of its hunting very urgent. A separate ordinance was made in 1925, by which the orang utan was excepted from the other kinds of monkeys to which the prohibitive provisions to capture and kill do not apply. But in spite of this new regulation to capture and kill orang utans, still such quantities of these animals were exported in the last few years,

that it rightly drew the attention. Only after the attention of the custom officers was drawn to the fact that export could not be allowed and after the local authorities had been urged to enforce the observance of the ordinance of 1925 in a more efficient way, the scandalous persecution of the orang utan ended.

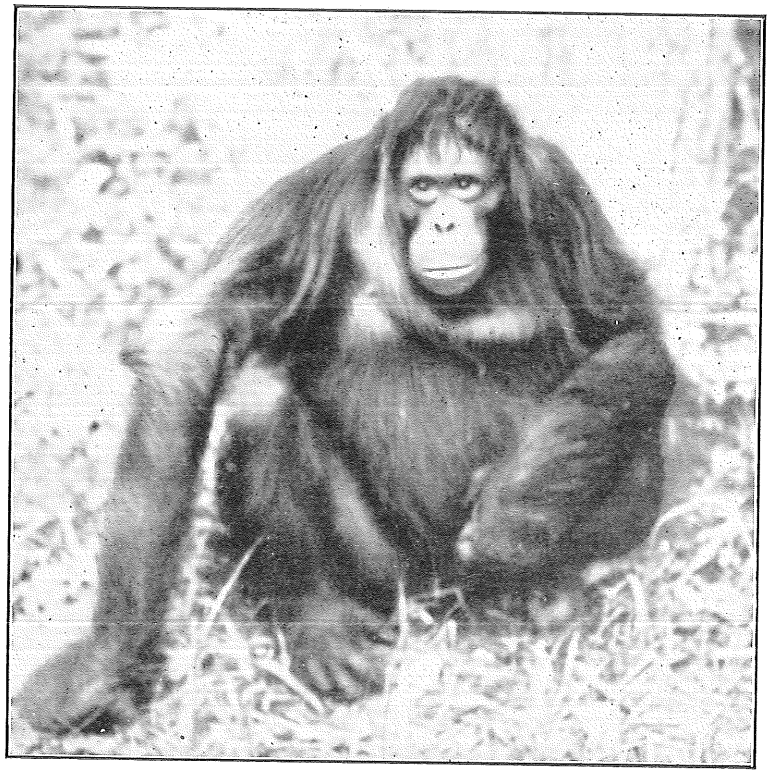


Fig. 2. The Orang Utan, female.

Also the rhinoceroses need protection urgently. The Javanese species *(Rhinoceros sondaicus)* has decreased so considerably that its number for Java has been estimated at hardly more than a few dozens, and also the Sumatra kind *(Rh. sumatrensis)* is strongly on the decline. These animals, besides being a victim to big-game hunting, are taken by the natives for the sake of their horns, of which the Javanese kind carries one, the Sumatra kind two, on its head. These horns are highly valued

by the Chinese, at some hunderd guilders a piece, and are used for a secret medicine. We notice in the statistics (see at the end of the publication) that the exported horns mostly go to Singapore, only a small quantity goes directly to China. From Java hardly any export has taken place publicly as here the rhinoceros has been protected since 1909, but all the same, many a specimen has been killed illegally. In the islands outside Java the rhinoceroses remained pretty much unprotected up to the present. The principal port for export of this product is Tandjoeng-

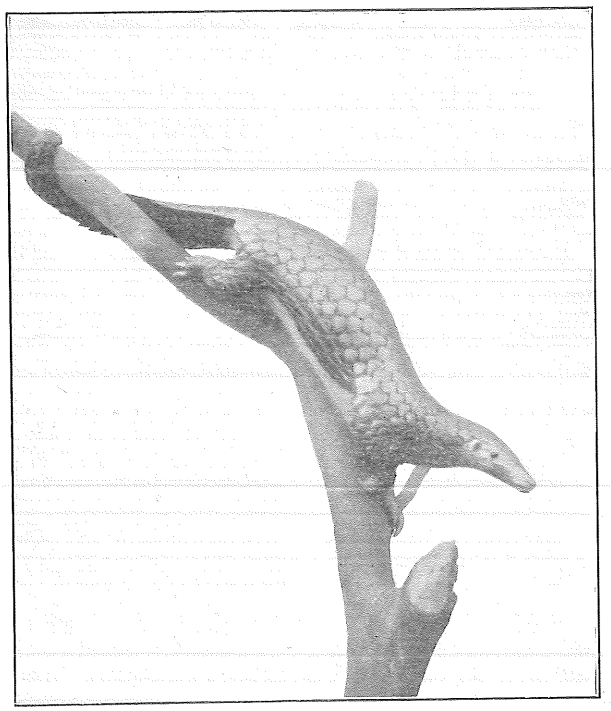


Fig. 3. The Scaly Ant-eater or Pangolin.

selor in East Borneo. The total export from the Netherlands Indies in 1920 was 70 kilograms, in the following years this quantity rapidly decreased, probably because the animals became more and more scarce. We see by the given prices, which vary between 200 and 400 guilders a kilogram, what large sums the Chinese will spend for these horns. We do

not possess exact figures about the weight of rhinoceros horns, but it is improbable that the weight of the two horns of the Sumatra species should exceed one kilogram. So we may suppose that during the last ten years an average of forty rhinoceroses yearly were sacrificed to the superstition of the Chinese, for, of course, there can be no question of any curative action of the horn. With the new regulations both species of rhinoceroses will be protected and also the export of their horns will be forbidden, so we hope to be in time to save these remarkable animals from total destruction.

For the same purpose, as that served by the rhinoceros horn and probably also as a surrogate for it, the Chinese use the scales of the pangolin or scaly ant-eater *(Manis javanica*, Fig. 3). Notwithstanding the fact that this animal really has been protected since 1909, large quantities of scales were exported. So in 1925 ant-eater scales were exported from Java to a value of 3,700 guilders, in spite of the fact that the pangolin had been mentioned expressly amongst the animals to be protected at any time. And so this proves again how little effective prohibitive provisions to capture and kill are, if not at the same time an export prohibition is instituted. As for the export-figures, here only the value is published, but from this we can deduce the approximate number of animals killed for this export. A pikul (about 60 kilos) of ant-eater scales at Batavia costs about 125 guilders; the value of the average yearly export amounts to more than five thousand guilders, representing 40 pikuls or 2400 kilograms scales. The average weight of a dry skin with scales is 700 to 800 grams, the scales alone do not weigh more than half a kilo, so yearly between four and five thousand pangolins are killed, which number for the last years certainly must be doubled. As this animal is really more useful than noxious — it lives chiefly on termites — it is surely not to be condoned that such a large number of these are yearly sacrificed to a foolish Chinese custom. By the newly proposed regulations once again it is forbidden to capture and kill this animal and to export its scales.

Besides the rhinoceros and the ant-eater, amongst the mammals the tapir and the Sumatra goat antelope *(Nemorrhaedus sumatrensis)* are also protected; both species, as far as the Netherlands Indies are concerned, are only found in Sumatra, and are interesting for their relationship to other species living in more remote regions.

The birds mentioned in these regulatoins are nearly all species of which the entire skin or special ornamental plumage have a great commercial value, while the hornbills are hunted mainly for their peculiar beak. One kind *(Rhinoplax vigil)* has a solid bill which is used for carving, as if it were ivory.

No other articles of export have roused so much protest and indignation as have bird-skins and ornamental plumage. Amongst the bird-

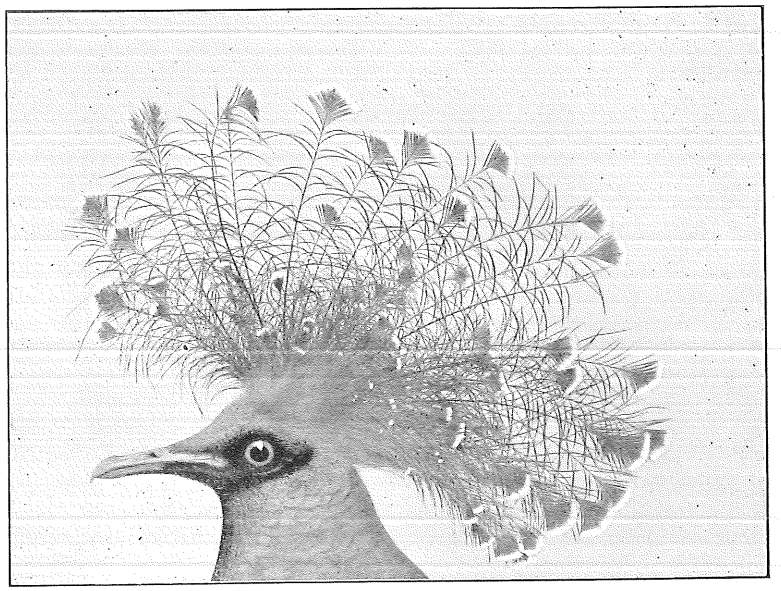


Fig. 4. Head of the Crowned Pigeon.

skins those of the birds of paradise took the first place, and of the ornamental feathers the heads of crowned pigeons (Fig. 4) formed a large part.

In July 1911 the crowned pigeons were excluded from the list of the absolutely unprotected kinds of birds and transferred to that group of

animals, of which the hunting at least could be limited by the local authorities. So then together with the birds of paradise, the crowned pigeons were practically the only birds of which the hunting was restricted by some regulation, which did not take away the fact that in the open season these birds were decimated in a terrible way; often hundreds of thousand were killed.

It has greatly been this aimless and needless slaughter amongst birds of paradise and crowned pigeons which rightly aroused indignation everywhere, and societies that had the protection of nature in view, in the Netherlands Indies as well as in Holland and abroad, more than once tried to exert pressure on the Netherlands-Indian or Dutch government to put an end to this.

So in April 1913 the Netherlands-Indian Society for the Protection of Nature addressed a petition to the government to urge a prohibition to export bird-skins — in the first place those of the birds of paradise — from Dutch New Guinea. The commercial interests, however, then were yet too predominant and the government refused the petition, stating that for the time being extermination of the birds mentioned need not be feared and that a general prohibition would present too many difficulties. In the preceding year bird-skins derived from Dutch New Guinea had been exported to a value of about a million guilders.

The action to obtain a restriction or rather a total prohibition of this hunting was carried on with unabated vigour. An important victory was gained in 1920, when the prohibition to import into England all birds of paradise was enforced, while already some time before the United States had determined to refuse all import of skins and feathers of wild birds, with the exception of ostrich-feathers. No doubt in this way an important market was closed to this ornamental plumage, for, although the export from the Netherlands Indies mostly took place to France, the majority of the Parisian ladies hats trimmed with feathers of birds of paradise or crowned pigeons were sent to England or America. During the month of September 1913, which immediately preceded the prohibition to import feathers into the United States, in New York only, 8,500 skins of the Great bird of paradise had been

imported. After 1920 an acute decline in the export of bird-skins from the Netherlands Indies begun which decline since then has become continuously greater. In 1922 also the Netherlands-Indian government showed its willingness by an ordinance in which all hunting for crowned pigeons and birds of paradise, with the exception of the so-called yellow kinds *(Paradisea apoda* and *minor)*, was forbidden. Moreover, on the islands around the mainland of New Guinea hunting for these kinds was only to be allowed after obtaining a license of the government. By this ordinance the hunting for the so-called Aru birds, the loveliest and largest kind of *Paradisea apoda*, was practically absolutely restricted. In 1924 also the export of crowned pigeons and birds of paradise, with the exception of the yellow kinds, was prohibited.

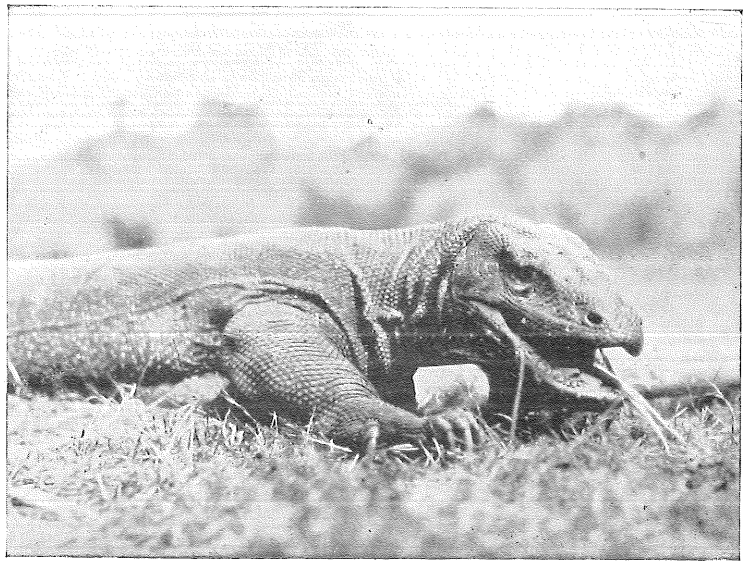
The fashion to trim hats with ornamental plumage of birds fortunately has passed and to this fact too, we have to ascribe the strong decline of the export. The very much decreased government-revenues obtained from the export of bird-skins and ornamental feathers, has also been the cause that now the government by the newly proposed regulations has proceeded to protect not only all birds of paradise and crowned pigeons, but practically all those birds of which the skins or ornamental plumage have any commercial value. Especially the provision that skins and feathers of these birds may not be exported, will put an end to their persecution.

In the preceding years this export often attained very high figures. So in 1919, with a total of more than 120,000 skins to a value of more than two million guilders; the average value of a skin varies between ten and thirty guilders. The year 1923 shows a record in the export of feathers, namely 5,702 kilograms; 1925 is a record-year as far as the value goes, when one kilo cost more than 580 guilders. It is hard to calculate how many birds have been killed for this feather trade, for in the statistics of the customs all possible feathers, heads and parts of their skin of most different birds have been mixed up; but anyway their number must be enormous if one considers what a quantity of feathers go into one kilogram. France and in the second place

Holland are the principal countries where these bird-skins and ornamental feathers come on the market.

The only reptile which was protected up till now, is the giant monitor of Flores *(Varanus komodoensis,* Fig. 5) which lives exclusively in West Flores and on some islands off the coast. The skin of this remarkable animal, confined to such a small area, fortunately has little commercial value, otherwise probably this species would not exist any more, but this animal has to be protected chiefly against the passion of collectors for Musea.

And then in the territory outside Java and Madura, the elephant, the banteng, the dwarf buffalo and the babirussa are partly protected, as it has been stipulated that only the mature male specimens may be hunted



From "Trop. Natuur"

Fig. 5. The Giant Monitor of Komodo.

and that the open season may not exceed six successive months. An unlimited hunting for these animals could no doubt, in the long run, emperil their continuance and, besides, the babirussa and the dwarf buffalo are very interesting animals, related to some extinct kinds, and now

confined to Celebes and some islands of the Moluccas only. For Java the shooting of bantengs is regulated by the game-enactment.

Besides limiting the hunting for the above mentioned animals, they are also protected by forbidding the export of living specimens as well as their skins. And moreover, the export of ivory is restricted within certain limits. With this export fortunately not so many animals are concerned, as the export of this product from the Netherlands Indies — and nearly exclusively from Sumatra — is fairly small; during the last ten years an average of 350 kilograms yearly only. The ivory of the Indian elephant is not so valuable as that of the African and therefore it is less in demand; the published value is only ten to twenty guilders a kilo. As in Sumatra probably mainly middle-sized males are killed — the animals with the very large tusks have disappeared for the greater part — and the average weight of a pair of tusks of such animals is estimated at ten to twelve kilograms, the above mentioned export-figures amount to about 35 elephants which are shot yearly.

The two principal ports to which the ivory is sent, are Singapore and Penang. Much ivory is also carved here locally, so we may suppose that yearly many more elephants are killed than the 35 the tusks of which are exported. With the new regulations export of elephant-tusks weighing less than 5 kilograms a piece, is forbidden. A minimum weight of 5 kilograms is required so that not too young males will be shot for the sake of the ivory.

Besides the animals already mentioned, there are stil a number of species that are partly protected by only forbidding the export, skins and other parts of their body included. The animals meant here are tree-shrews of tupaias *(Tupaja)*, all marsupials, deer, parrots, wild gallinaceous birds and monitors. Judging by the enormous export of deer skins and deer horns and monitor skins, the preservation of these animals is really seriously threatened, so that here a prohibitive regulation is fully justified.

The fashion of the last few years to make all kinds of articles of reptile leather also in our colonies exacts numerous victims. As for

the export of snake skins, until now acurate figures are lacking, but there are separate statements of the skins of the so-called monitors *(Varanus* species). The export of these skins in the last few years has increased enormously and in 1926 came to 657,000 pieces, more than tenfold of what was exported in 1918. This export took place almost exclusively from Java, only after 1924 also the other islands join in this trade. The export-value of these skins varies between thirty cents and 1.20 guilders a piece. The principal purchasers are Holland, England, France and Japan; the export to England especially of late years has greatly increased to that now this country purchases nearly twice the quantity of all the other countries put together. Also this trade will be stopped by the new enactment which forbids the export of monitor skins.

As far as deer skins are concerned, the yearly export varies between about 70,000 and 225,000 pieces; for the last ten years an average of 130,000 yearly. To this we have to add an average of 80,000 kilograms deer antlers. As this export as well as that of deer skins, takes place chiefly from Macassar, the product must originate mainly from the Moluccan deer, which has much smaller antlers than the Javanese or Sumatra kind. The average weight of a pair of antlers of the Moluccan deer is about one kilogram, so that the above mentioned export represents 80,000 deer. Partly, these antlers will come from the same animals of which the skins are exported, but we may suppose that of a rather large number only the antlers are kept, as the preparation of the skins demands much more care; on the other hand, amongst the skins there are sure to be many originating from female-deer. The estimation that yearly 200,000 deer are sacrificed to trade in these colonies, will not be far from the truth. It is clear that by such a slaughter, in the long run, the species will be threatened in its existence. The principal purchasers of deer skins are Singapore and the United States; the antlers go chiefly to China and Hongkong, and next to that, considerable quantities are dispatched to Holland, Singapore and Japan. By the new regulations the export of skins and horns

of deer from Java only will be prohibited, but it is to be hoped that this export will be stopped totally and that within a short time there will come an end to this trade, which otherwise would lead unavoidably to the extermination of the species.

The export of living specimens of deer and of parrots is permitted, because the export of living deer will never take on such dimensions that the species will suffer from it, while parrots are loved everywhere as cage-birds and so this trade will not be interfered with, as long as these birds are not exported in such large quantities as to suppose that they will be killed elsewhere for the sake of their plumage.

The marsupials are protected in this way because the skins of some kinds of this interesting group of animals seem to have some commercial value. Moreover these primitive mammals are mostly restricted to a small area and are on the whole not able to resist unfavorable circumstances and injurious influences, so that serious fears are entertained for the preservation of many of the species, if the export takes place unhindered.

This same argument applies to the many remarkable wild gallinaceous birds in the Malay Archipelago, and here too we find many kinds that for the sake of their beautiful feathers or as valuable cage-birds, e.g. Argus pheasants, firebacks, would be exposed to too much persecution if the export was absolutely free.

Finally the tree-shrews are included in the list of animals of which the export is forbidden, the reason for this is that these useful insectivores are often mistaken for the injurious coconut squirrels and if it ever should come to exporting the skins of the latter, it must be prevented that the tupaias should also become victims.

Besides the statistics about the export of the above mentioned species, partly or entirely protected by the new regulations, one finds in the tables appended some columns that deserve further attention.

First of all we notice an enormous increase after 1921 of the export of living animals, which chiefly means wild animals; export of cattle, poultry and domesticated animals being excluded. While in 1921 not

yet 80,000 specimens were exported, this number in 1925 rises to 368,000, and in 1926 nearly 490,000 birds and in 1927 even more than 580,000 birds were dispatched from Java only. The value published proves that from Java chiefly smaller animals are exported, such as birds, and the larger animals from the other islands. The average value of the animals shipped from Java varies between 5 and 20 cents, of those from the other islands between two and four guilders. The exported animals, practically all, are sent to Singapore. As specified statements are not available we do not know what kinds chiefly are exported but the enormous figures in any case justify a further investigation.

It is the same with the column "skins" of these statistics. Except skins of cattle and of those kinds mentioned separately in the table, in this column are classed all skins of mammals, reptiles (snakes and crocodiles) and sea-fishes, such as sharks and rays. As here too no specification has taken place and, moreover, only the weight is published, this column really tells us very little. Here too we have to await further information before we can find out if by this export the existence of some species of animals is really threatened. Of these skins too, besides the United States, Singapore is the principal purchaser.

Then we will mention another product from the bird-world which is exported in enormous quantities from the Netherlands Indies, namely the edible nests of swifts *(Collocalia* species*)*. During the last ten years an average of 93,000 kilograms was exported yearly. A kilo of those nests, unsorted, contains about 150 pieces, so yearly fourteen million nests are gathered. The value per kilo varies between six and thirteen guilders, the average being ten guilders. This product is sold nearly exclusively to Singapore, in comparison only a small part of the total number goes directly to China.

In spite of these enormous figures, we need have no fear for the extermination of the edible-nest swifts, as the birds themselves do not fall as victims to this epicurism of the Chinese. Moreover, the countless inaccessible caves and grottoes on precipitous coasts, where these birds

nest, offer sufficient guarantee for the preservation of the species. And then also, the gathering of these nests often is leased, and the lease-holder will mostly see to it that the gathering takes place in such a way that the birds do not suffer too much by it. All the same, an unlimited gathering, also during the period when the swifts have eggs or nestlings, would be detrimental in the long run, and also for the sake of the trade itself we have to grant a definite period of rest to these birds. In the new regulations a provision has been inserted by which the edible nests may only be gathered during nine successive months of any year; for Java and Madura, furthermore, it is stipulated that this period of rest will be from March till May, inclusive.

Finally the tables contain the export-figures of tortoise-shell. Also in the seas of the East-Indian Archipelago the species *(Chelonia imbricata)* which produces the real tortoise-shell, is much hunted. The export in the last ten years amounted to an average of 17,000 kilograms yearly, and as the average weight of the entire carapace can be estimated at little less than one kilogram, the published amount in kilos corresponds almost with the number of animals that were killed. The export-value diverges much in the different years, and varies between 4.50 and 16 guilders per kilo. The export takes place chiefly to Singapore and Japan, but also some considerable shipments are sent to Holland.

In how far the species could decrease by the demand for this product, cannot be estimated, but much more than the export of tortoise-shell, the gathering of eggs, which is a general custom in the Archipelago, is a danger to its preservation. The new regulations does not yet give any provision in regard to this, but the question of limiting the hunting for this kind of turtles and of the gathering of its eggs will certainly have to be considered soon.

If we summarize what the new enactment, where the export of animal products are concerned, will bring to us,we see that before long the columns: rhinoceros horn, Manis scales and Varanus skins will disappear from the statistics, while by protecting all ornamental birds, important to trade, the export of birds skins and feathers will decrease

considerably. But in the long run, we have to come to a general export-prohibition of all wild animals and products originating therefrom, with the exception of a few. This final purpose can be reached because observance and enforcement of this prohibition is quite possible. Next to a prohibitive regulation as to export from the country of origin, all civilized countries ought to prevent the import of the protected species, for a prohibition of import is the best means to put an end to the smuggling of forbidden articles.

Finally, we will speak about some provisions of the new game-enactment, in so far as they are connected with the question of protection. As we said before, this new enactment, for the time being, will only be enforced in Java and Madura, later on probably also in some other districts.

One of the first provisions of this new enactment is, that for hunting, not only with a fire-arm but also with an air-gun, a license will be required. The air-guns, which formerly were not considered a means for hunting, since then have become so perfect that with this one can shoot practically all game, with the exception of so-called big game. Another improvement is that now not all animals, ofcourse besides the protected kinds, may be hunted, but that the game is specified by name. Besides the protected species and the game, there now remains a large group of animals which may indeed be captured and killed but not shot by a fire-arm or an air-gun.

The animals that may be hunted, are classed in four groups, namely a. big game, b. small game, c. migratory game, d. harmful animals. By big game we understand elephants, bangtengs, deer, kijangs, dwarf buffaloes and hog-deer. As the elephants, dwarf buffaloes and hog-deer do not occur in Java, these animals only come into question when in the regions where they are found, the game-enactment is enforced. But also where this is not the case, hunting for these and for bantengs is not allowed without restriction, for then they come under the regulations of the wild animals protection enactment.

By small game we understand:- chevrotains or mouse deer, the Javanese hare *(Lepus nigricollis)* and further more, those kinds of

resident birds which in general can be considered as game-birds. The migratory game include plovers, snipes and the water-cock *(Gallicrex cinerea)*, birds that appear in our colonies only during migration in wintertime. The list of harmful animals contains not less than 21 species or groups of species.

The hunting-season for migratory game and for harmful animals is open all the year round, for big and small game, as far as Java and Madura are concerned, only four months of the year, namely from August up till November, inclusive. Furthermore, it is prohibited to hunt females and immature males of the big game kinds. And for all hunting the use of lights is strictly forbidden. Also it is not allowed to hunt big game by means of expanded nets, snares or pitfalls.

It was considered impracticable to state in each separate licence the number of animals of one species the holder of the licence was allowed to shoot, but this can be done by the Heads of the Provincial Authorities, as they have power to impose further restrictions of the hunting in their districts and even to prohibit it totally; they may also provide that yet other hunting-methods may not be applied.

Finally the new enactment provides for the institution of hunting committees which will consist of not more than 7 members; one of those has to be a Civil Service official and another an officer of the Forest Service. These committees advise the provincial authorities concerning all hunting matters and report their activities once a year to the Director of Agriculture.

By the institution of these hunting committees we hope to obtain more information about the state of the game and to arrive at a better observance of the regulations.

There, where the game-enactment has not effect, the provincial authorities can further regulate the hunting; in these cases the provisions of the wild animals protection enactment have to be taken as the guiding principle as this enactment always has precedence over the game-enactment and every other local regulation of the hunting.

II. NATURE RESERVES.

As we said in the beginning of the former chapter, preservation of flora and fauna, besides by issuing general regulations for their protection, can also take place by protecting the plants and animals in their original home and by enabling them to develop there freely. Most of the so-called nature reserves have been instituted for the sake of the preservation of plants and animals living in those places. But a nature reserve can also have in view the protection of a certain area for its own sake, for instance a spot remarkable from the geological point of view, an then flora and fauna may recede into the background.

Seeing the immense tropical virgin forests, one would suppose that here would be no urgency to create nature reserves, but if one notices how quickly in Java the primeval jungle has disappeared, so that now in the lowlands hardly any real jungle is to be found any more, one will have to acknowledge that there is *periculum in mora.* Sumatra is going the same way as Java; here too the primeval forest is disappearing at an alarmingly rapid rate, and where cultivation does not already exist, often the land has been granted years before, so that it is hardly possible to withdraw it from the violating hand of the cultivator. Nobody will deny that also the original native population cuts down many forests for the sake of agriculture, and that especially the so-called "ladang" system, by which the forest again and again is cleared for one or two harvests, is pernicious, but we notice, that where the European planter or dealer has not yet stepped in, the land as a rule shows its original character over vast ranges. Therefore it is necessary that parts of original nature are reserved in time, for the sake of science as well as for recreation. Who would wish to see Java as one large rice field, one vast rubber forest or tea plantation? Our posterity will be most thankful to us for having been able to preserve grounds

where one can study the original flora and fauna and where one can enjoy nature undefiled by the hand of man. The idea of saving for ever such regions from the hands of unrelenting cultivation, is of a fairly recent date; and in the tropics it is only quite lately that we have come to realize this idea. All the same Java possessed such a reservation rather early although the name "nature reserve" had then not yet been introduced officially. We owe to the foresight of the former Director of the Botanical Gardens, Professor MELCHIOR TREUB, that as early as 1889 the virgin forests situated above the well-known mountain-garden Tjibodas, were reserved, specially for the sake of the many scientists who came here to this rightly famous treasure garden for research work. The reserved area included all the forest lying between the elevations 1400 and 1900 metres (Pl. 1). The higher grounds then already were kept as a forest reserve; later on these also were declared to be a nature reserve, because the name forest reserve indicates that the soil shall always be covered with forest, but does not exclude exploitation.

In most countries private societies have been formed for the protection of nature, which have in view to rouse the public interest for this cause and so to try by joint action to preserve wild life as much as possible and to promote the institution of nature reserves.

So in July 1912 also in the Netherlands Indies the Netherlands-Indian Society for the Protection of Nature was formed, which was officially recognized by the government in February 1913. We owe to the untiring energy and zeal of the late Dr. S. H. KOORDERS, a former officer of the Forest Department, who turned his activities especially towards phytography, that this society was formed and has achieved so much in comparatively few years. The first year after the institution of the Society, it counted not yet 400 members, and even at present the number of members is very small, which may be explained by the fact that the members have to be recruited nearly exclusively amongst the rather small European population, who mostly stay here only for a short time and therefore often show little interest in the preservation of scenic beauty of which they themselves will enjoy practically nothing. And besides, however desirable a large number of members might be, they are

From "Koorders, Flora Tjibodas".

View of the jungle in the nature reserve Tjibodas, at an altitude of 1550 m.

not indispensable for the continued existence of the society, as is so often the case in other countries, where such societies need capital to buy grounds from of the hands of vandals. In the Netherlands Indies all grounds over which no rights are exerted by individuals, belong to the so-called government domain; and the government can dispose freely of these grounds. Buying up land for the sake of the protection of nature is here hardly ever necessary, and this is a very fortunate circumstance, for a private society in the tropics could never become so rich that it could compete with those who for agricultural or industrial purposes have cast their eyes on a certain tract of land.

Soon after its institution, the above mentioned society applied to the government with the request to grant to it large tracts as nature reserves, on long lease or at least to grant the rights of use to the society. This request could not be complied with, as the government rightly judged, that it should keep in its own hands the management and supervision of those grounds belonging to the government domain, as it might be safely anticipated that, for lack of the proper means, the above mentioned society would never be able to fulfil this task properly.

The government then proceeded to take the case of the protection of nature into her own hands and in March 1916 an ordinance was enacted (see after, Appendix I) giving the governor-general the power to assign certain grounds belonging to the government domain, as nature reserves, viz., grounds which for the sake of their special scientific or aesthetic value, should, as a matter of public interest, be kept as intact as possible. In such nature reserve it is forbidden to collect plants or animals, to hunt, to keep cattle and in general to perform any action by which the existing natural conditions are altered. The Director of Agriculture can grant exemption of these prohibitive regulations for scientific purposes. The officials of the Forest Service are charged with the supervision of the nature reserves wherever the grounds are situated within the government forests, and for other regions the Heads of Local Authorities are held responsible. So the Society for the Protection of Nature was actually quite eliminated and its task was reduced to that of an advisory board.

The Society obtained only one single nature reserve directly under its own management, namely the nature reserve at Depok, situated between Buitenzorg and Batavia. Here was a plot of virgin forest belonging to the private estate of Depok, which through peculiar circumstances had been preserved, although all the adjacent country had been put under cultivation. More than two centuries ago this forest was given to the Christian Community of Depok with the condition that this ground should not be cultivated and that in the forest trees should not be cut down except for the private use of the community. A small part of this forest, about 6 hectares (15 acres), which had suffered least of the clearing process, was given in management by the community of Depok as a nature reserve to the Netherlands-Indian Society for the Protection of Nature for the time of its existence.

Also in other respects there is plenty of scope for the activities of the society. In 1917 it published a small pamphlet "The Protection of Nature and the School" which was supplied free of cost to all Dutch, Dutch-Native and Dutch-Chinese schools in the Netherlands Indies, while a malay translation was sent to all native village schools. At the same time all schools were summoned by the Educational Department to propagate the ideas put down in this pamphlet and so to inculcate feelings of respect and love of nature in the minds of the children.

Dr. KOORDERS, the founder and first chairman of this Society. had the satisfaction to see shortly before his death the first government decree in February 1919 whereby 17 of the areas applied for by the Society, were turned into nature reserves on the footing of the enactment, enforced in 1916, followed a few months later by a second decree, so that the East Indies then already possessed 33 nature reserves belonging to the government domain.

At present the Netherlands Indies can boast of in all 76 nature reserves; 55 are situated in Java. Amongst these there are very large areas, the largest till now being the LORENTZ reserve in Dutch South New Guinea. It reaches from the tropical beach as far as the Wilhelmina mountain-range which is covered with eternal snow, and the highest peak of which attains a height of 4750 metres. Its greatest length mea-

sures about 150 kilometres and its width varies between 10 and 60 kilometres. This extensive reserve is of great importance for the preservation of the flora and fauna of Dutch South New Guinea. It is named after H. A. LORENTZ, who was the first European to ascend the snow-covered mountain in 1909 and reached the above mentioned top.

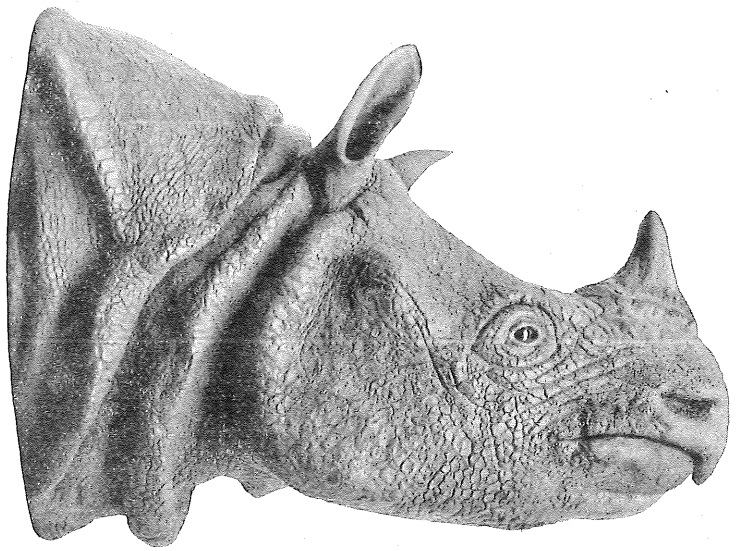


Fig. 6. Head of the Javanese Rhinoceros.

Other nature reserves covering large areas are Oedjoeng koelon and Poerwo. Oedjoeng koelon, the peninsula situated in the extreme west of Java which has a surface of about 375 square kilometres and like the equally preserved Prinsen Island, lying off the coast and 175 square kilometres large, is entirely covered with primeval jungle, and uninhabited. Both areas, in the first place, serve as general reservations for the flora and fauna of West Java, while Oedjoeng koelon is more specially reserved for the preservation of the Javanese rhinoceros (Fig. 6) and banteng, of which the first kind in Java is practically extinct and the second kind is found in ever declining numbers.

The peninsula Poerwo or Blambangan in the extreme east of Java has about the same importance as a nature reserve for East Java, as Oedjoeng koelon and Prinsen Island have for West Java. It is an area,

covering about 42,000 hectares, also uninhabited and covered with forests, but it has less game and the rhinoceros is not found there, as this species does not occur at all in Central and East Java.

In the other larger islands, for the time being, no extensive reservations are found, except in Celebes where the nature reserves Gunong Lokon and Gunong Tjongkoko Batoeangoes have been set apart and instituted specially for the preservation of the very peculiar and characteristic fauna and flora of Celebes. The reserve on the Gunong Lokon in the residency of Menado includes the part of the conical top of this volcano lying above 1450 metres and owes its importance, not only to the fact that it is a reservation for local plant and animal life but also to the presence of remarkable Pandanus forests *(Pandanus Koordersi)*. The other nature reserve includes an area lying in the northeast of the Minahassa, opposite the island Lembeh, and with its remarkable volcanoes, Gunong Tjongkoko (1373 metres) and Gunong Batoeangoes (1173 metres), is destined as a region for the protection of the flora and fauna in the extreme north of Celebes. Here also two kinds of mammals characteristic of Celebes occur, namely the babirussa and the dwarf buffalo *(Anoa,* Fig. 7).

It is a great pity that we do not possess any reservations of importance in Central and South Celebes. But more urgent is the institution of a number of large nature reserves in Sumatra and Borneo. The rapid progress of cultivation there, makes it necessary to intervene. Soon, at least in the lowlands, all available grounds will be given up to agriculture or other forms of cultivation and notwithstanding all regulations for the protection of wild animals, however well they may be observed, in the long run these animals wil be doomed to disappear, if the extensive forests — the first condition for their existence — should be taken away. If we want to save permanently something of the curious fauna which is found in Sumatra and Borneo at present, such as elephants, Sumatra rhinoceroses, tapirs, orang utans and so many other representatives, then it is our duty to reserve vast areas, specially destined for their preservation. The Netherlands Indian Society for the Protection of Nature and the committee formed in Holland in 1925 for

the International Protection of Nature, are already acting to promote the institution of such reservations and already negociations have been opened with the purpose of selecting the necessary regions in Acheen, Tapanuli, Sumatra West Coast, Palembang and West Borneo. We hope that within a short time these grounds will really be made officially into nature reserves.

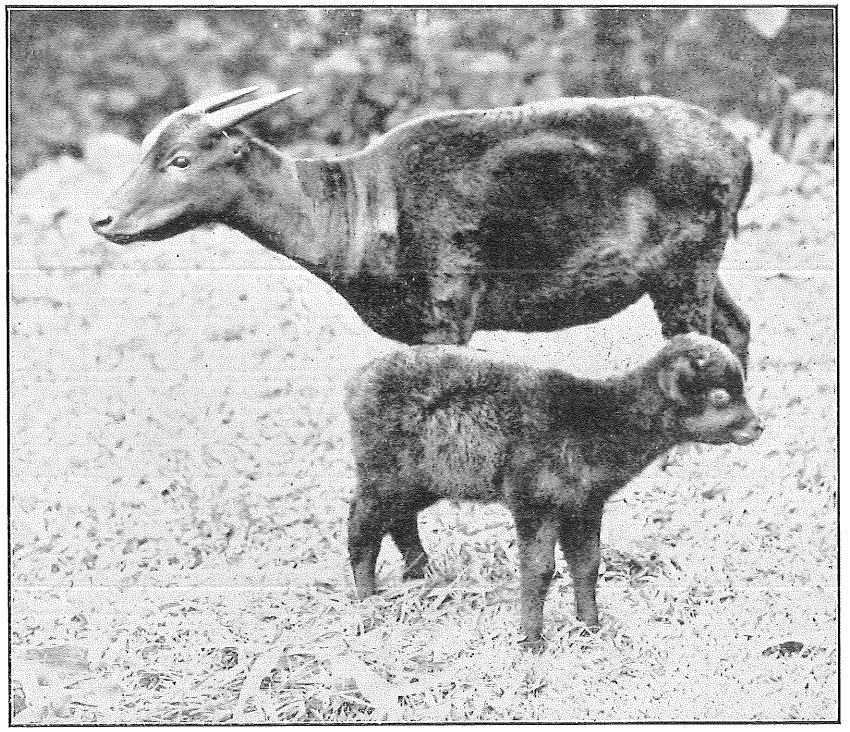


Fig. 7. The Dwarf buffalo of Celebes, female and calf.

Sometimes it is pretended that such vast reserves have little value if their real protection still leaves so much to be desired. But truly, the timely reservation of such grounds as nature reserve is of great importance, the advantage being that all cultivation is excluded for the future and although we may at present not be able to prevent that here and there trees are felled or animals hunted secretly, the ground in its entirety is preserved in its natural condition, while with local and occa-

sional destruction, the flora and fauna have every time an opportunity to recover again.

Next to these large reserves which have in view the assured preservation of the entire flora and fauna of a certain region, areas of a smaller size have been reserved to protect more local objects or for the sake of one single species.

So there are nature reserves, consisting of one single tree, as f.i. Baringin Sati at Fort van der Capellen in West Sumatra, where one old huge banyan tree stands. Other examples of the kind are the nature reserve Getas, in the residency of Semarang, a specially beautiful specimen of *Dipterocarpus Hasselti,* of which this is the most eastward locality. Also on the plantation Malabar in the Preanger some specimens of *Morus macroura,* a rare kind of tree in Java, are protected. To these also belong the habitats of the remarkable Rafflesia (Pl. 2), the well-known gigantic flowers with a diametre of nearly a metre, parasitizing on lianas. These plants have no leaves, we only see the flowers which make their appearance directly out of the earth, and they draw their food by means of roots from those of other plants. These very curious plants are protected in three plots situated in the residency of Bencoolen, southwest Sumatra, and two others to be found in Acheen, in the most nothern part of Sumatra. On Noesa Kambangan off the south coast of Java a nature reserve is found where a species with smaller flowers grows.

Other nature reserves of rather large extent but also instituted for the preservation of certain kinds of plants, are Sangeh in Bali, consisting of a small forest of pahala trees *(Dipterocarpus),* very beautiful, straight-stemmed trees which, according to an old custom of the population, may only be used for the building of temples. Then also the nature reserve Dolok Saoet in Tapanuli, north Sumatra, which serves specially for the preservation of *Pinus Merkusi* which kind of tree occurs generally in north Sumatra and of which turpentine is obtained. It is the only genuine fir in the Archipelago which has its most southern limit of distribution in Korinchi. The nature reserve Napobalano on the island Moena, lying opposite the Boeton district in the southeast corner of

PL. 2

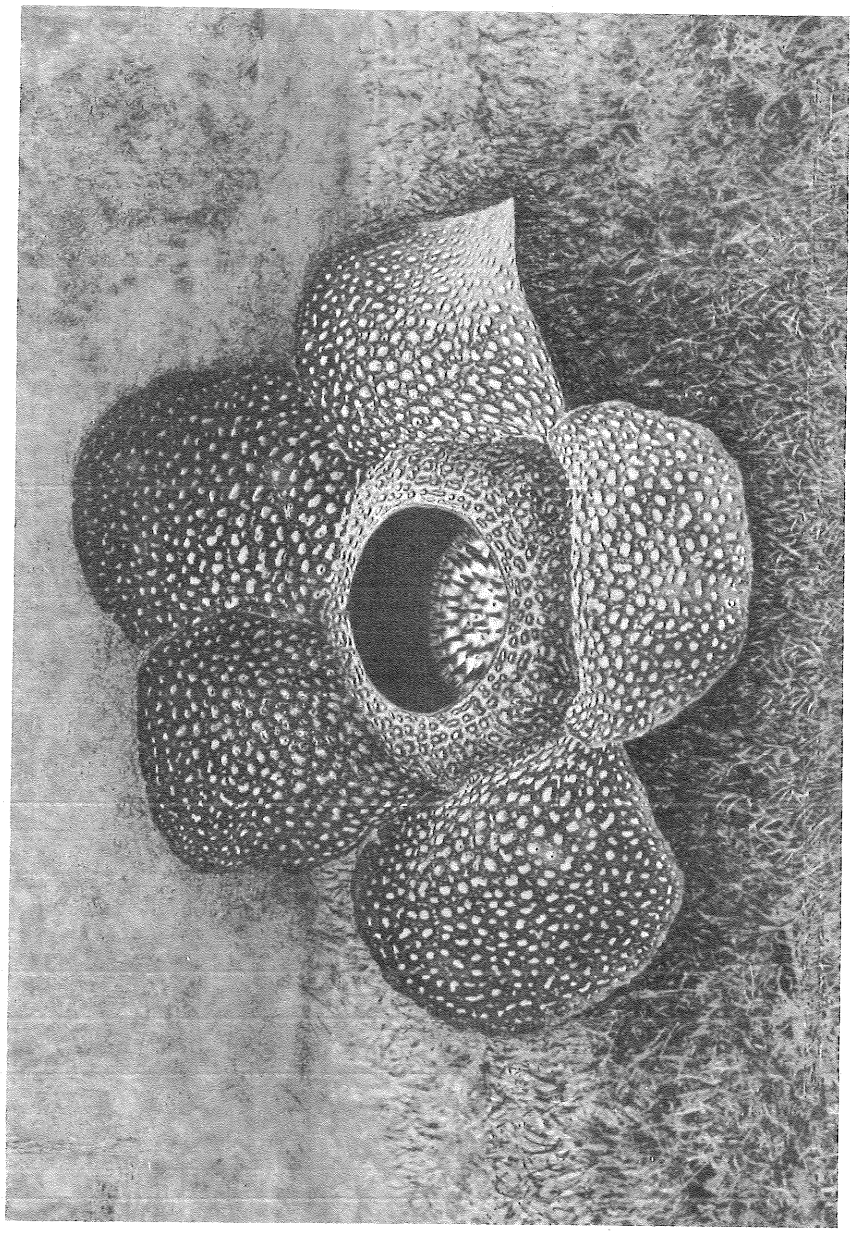


Photo L. Westenenk

The giant flower of *Rafflesia Arnoldi*, with a diametre of one metre.

Celebes, contains a very fine original forest of teak trees where we find several specimens with a height of 30 to 40 metres and a circumference of 4 to 5 metres. These teak forests are the only extensive forests of this kind to be found in the east of our archipelago.

Specially for the preservation of the local fauna and flora, in Java lake Danoe was reserved, with a surface of 2500 hectares in the residency of Bantam. It is known for its curious fresh-water swamp forests in which rare trees such as *Alstonia spathulata*, *Ficus retusa* and others

From "Trop. Natuur"

Fig. 8. Flower-buds of *Rafflesia Patma* at the foot of a huge tree.

grow. The small island Klein Kombuis, lying near the coast of the residency of Batavia, was declared to be a nature reserve because it can serve as an example of a coral island still covered with primeval forest,

while most of these islands, at least in the Java Sea, have been deforested and are now for the greater part planted with coconut-trees. The nature reserve Tjimoengkat on the southward slope of the Gunong Pangrango above Soekaboemi, was reserved for its rich bird-life while at the same time it lies on the way which many of the migratory birds, that spend the winter in Java, follow.

Important too are the nature reserves on the island Noesa Kambangan, situated on the south coast of Mid Java, as the flora and fauna of this island in many respects differ from those of the mainland of Java. The nature reserve of North Noesa Kambangan moreover includes beautifully developed mangrove forests while here too, practically confined to Noesa Kambangan, the *Rafflesia patma* (Fig. 8) is found which remains much smaller than the already mentioned Sumatra Rafflesia, the diametre being not more than 40 centimetres. In the nature reserve East Noesa Kambangan we also come across the remarkable Barringtonia association, while on the small islands off the coast the famous coronation flower *(Pisonia sylvestris*, Fig. 11) grows which is used at the coronation of the Sultans of Solo.

Besides, on the south coast of Java are reserved two islands:- Pulau Sempoe, opposite the Southern mountain-range in the residency of Malang, and Noesa Baroeng, opposite Poeger in the south of Djember; both islands are uninhabited and entirely covered with original jungle.

Outside Java we have to mention the nature reserve on the island Saobi of the Kangean archipelago, in the extreme east of the Java sea, that serves chiefly for the preservation of the remarkable fauna of this group of islands which harbour many endemic forms. Here the Megapodes, at least for the East Indian Archipelago, have their extreme western habitat; these birds are known for making enormous nest-mounts in which the very large eggs are laid.

On the East coast of Sumatra near Medan we find the nature reserve Sibolangit, one of the few remainders of the original primeval forest that once covered the vast lowlands here. This reservation is also of special importance, because to it belongs a garden where Sumatra plants are cultivated and where there is an opportunity for research work.

PL. 3

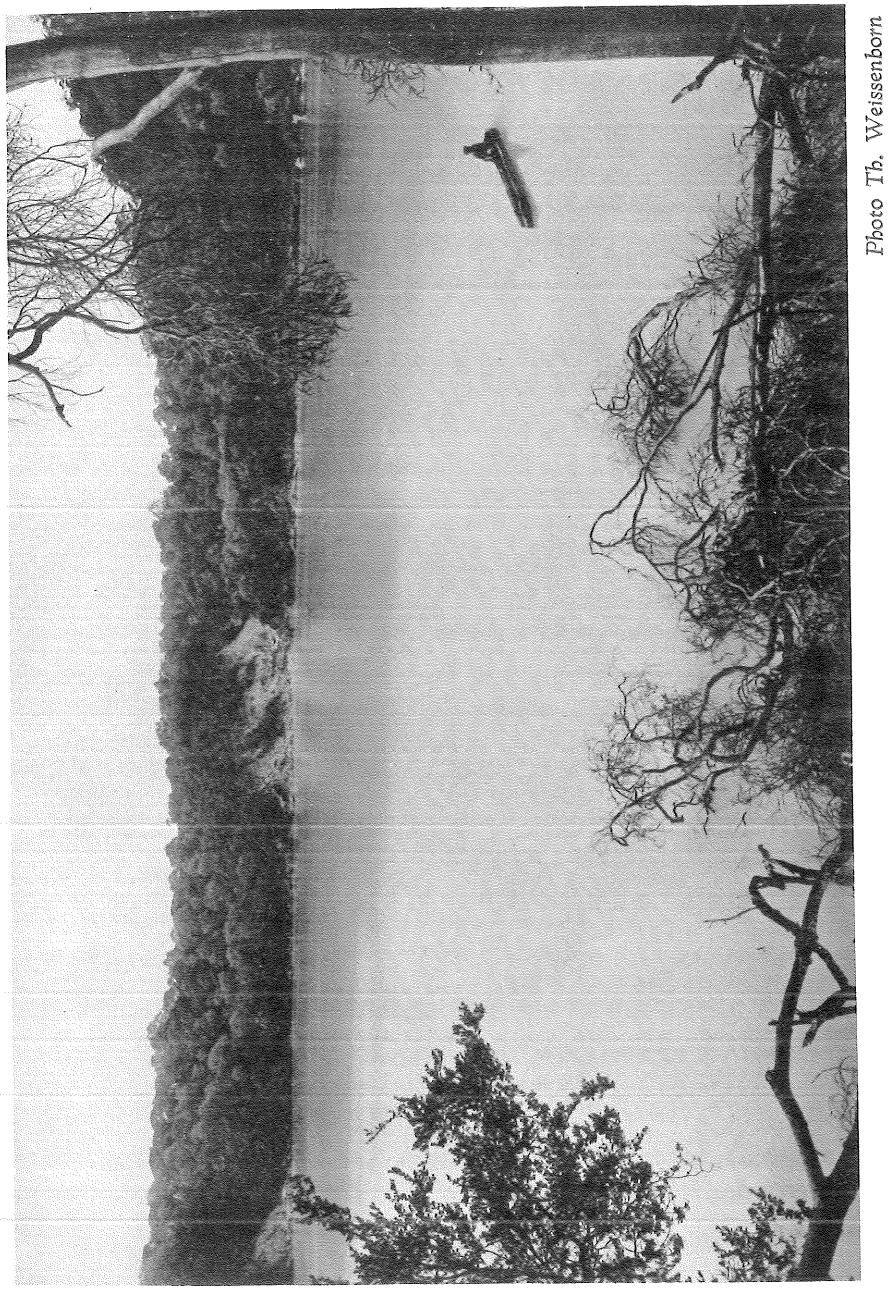


Photo Th. Weissenborn

The crater-lake Telagabodas.

Nature reserves have also been instituted more specially for the landscape; to these belong, for instance, the famous crater-lake Telaga Patenggang, at an altitude of 1500 metres, in the Preanger, south of Bandoeng, a favourite haunt of JUNGHUHN's. Another well-known protected lake is Telaga Bodas (Pl. 3) near Garoet, which is reserved together with the surrounding forest and the hot springs of Tjipanas nearby, for its very beautiful situation. Equally, the small island Noesa Gede, in the lake of Pendjaloe, was preserved; this was a favourite haunt of Dr. KOORDERS, the promotor of the Netherlands-Indian Society for the Protection of Nature. In honour of him this island after his death was rebaptized into "Koorders Island". The crater-lake Ranoe Panie Regoelo and Ranoe Koembolo, at an altitude of 2000 metres, between the well-known mountain station Tosari and the volcano Smeroe in East Java, were also assigned to become a nature reserve for the sake of their scenic beauty. Not less famous is the remarkable greenish-milky coloured crater-lake Kawah Idjen in the extreme east of Java. Besides this marvellous lake, the nature reserve here also includes many other volcanic curiosities and the beautiful old chemara forest *(Casuarina)* near Oengoep-oengoep.

On the other islands up to the present only a few reservations have been instituted for the sake of the beauty of the landscape. Here we have to mention in the first place the famous Anai gap in the Padang Highlands in Sumatra, that with its steep densely covered sides and the roaring Anai river in the deep valley, rightly rouses the admiration of its visitors. In the second place we must mention the Bantimoeroeng waterfall near Macassar. This waterfall is protected not only for the sake of the beautiful scenery but we also find here a remarkable luminous moss, while the surrounding is characterized by its abundance of butterflies, which had already been pointed out by WALLACE.

Volcanic mountain ranges too have been reserved for their geological importance as well as for the preservation of the remarkable flora and fauna of the high mountains. So in West Java the nature reserve Tjibodas Gunong Gede stretches from the mountain gardens with the well-known laboratory for scientific research to the tops of the extinguished

crater of the Gede mountain, and the Pangrango which reaches a height of 3022 metres. The crater of the Papandajan near Garoet, very interesting from a volcanic point of view, is also protected; to this nature reserve belongs, moreover, a characteristic forest at an altitude of about 2500 metres, which extends on both sides of the road leading from Tjisoeroepan to the crater.

Celebrated too, is the Tengger Sand-sea (Pl. 4) which is also a nature reserve. The real Sand-sea is the old crater bottom of an immense volcano, 10 kilometres long and 9 kilometres wide. Down steep mountainsides, one descends into this enormous valley, situated at an altitude of 2100 metres, while in the midst of it the ever active Bromo crater stands out. This Sand-sea, moreover, is remarkable from a botanical point of view for the peculiar arid steppe-like character of its flora. Geologically interesting too are the reservations Tjeding on the Idjen plateau in East Java, a travertine basin that has been formed around a hot spring and of which the sides have been built up by microscopic blue algae. Similar formations of calcareous sinter, but of greater dimensions, may be found on the East coast of Sumatra in the nature reserve Tinggiradja.

Furthermore some caves have been reserved, as the beautiful stalactite cave of Nglirip in the residency of Rembang, East Java, and the Oeloe Tjiangko cave in Djambi, where some years ago, Dr. A TOBLER discovered tools and remains of bones of prehistoric men. This same investigator also found a place in Palembang that must be considered as an open workshop of a prehistoric human race in Sumatra, where flint-tools were made. This place situated in the Palembang Highlands near Boengamas, having a surface of one hectare only, is also protected.

Furthermore the islands of Krakatau and Verlaten (Forsaken) Island in the Sunda Straits between Java and Sumatra, have been reserved for very special reasons. These islands that were devastated by the well-known eruption of 1883 and by which probably all plant and animal life was totally destroyed, are most interesting from a geological as well as from a biogeographical point of view. As they have been turned into nature reserves, human settlement and all other disturbing possibilities of

PL. 4

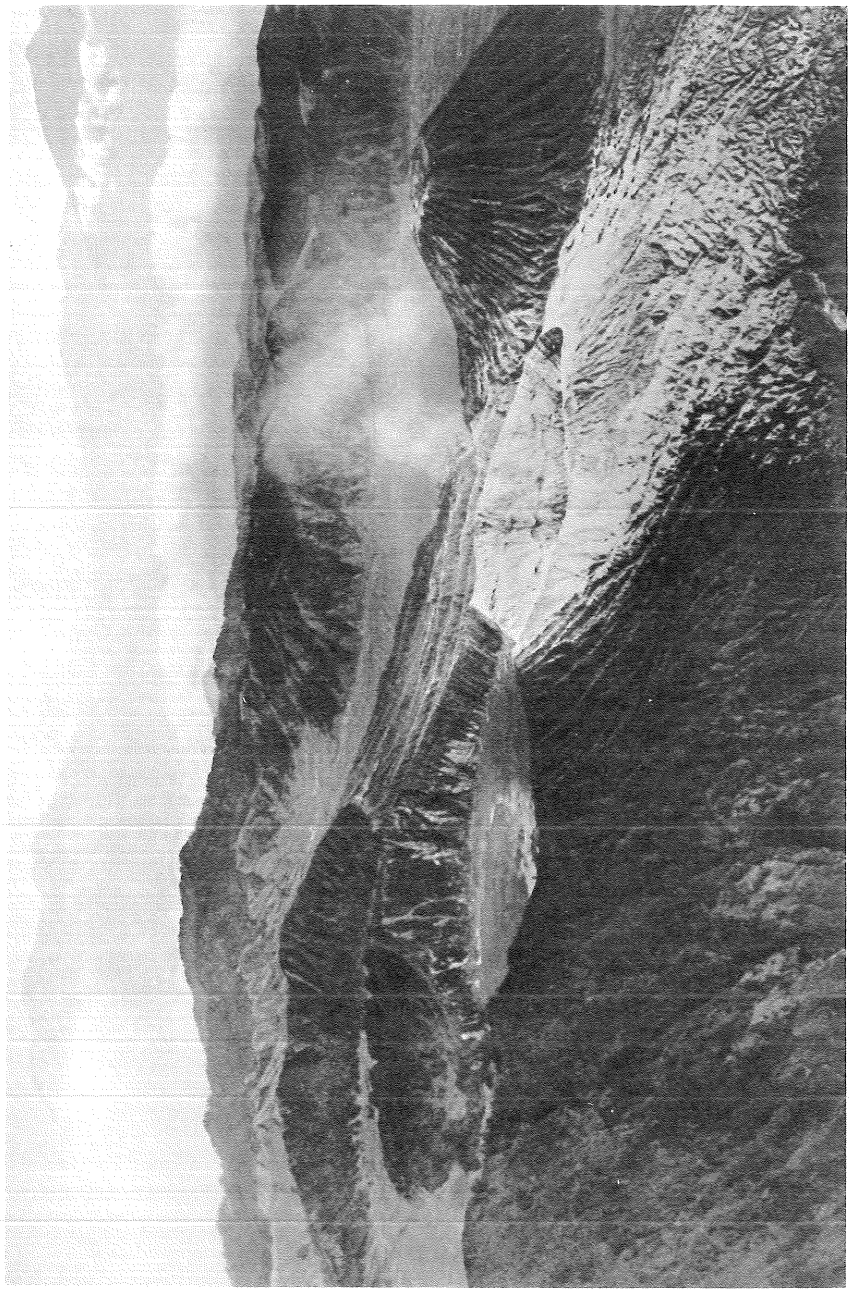


Photo by courtesy of the Mil. Air Force

Aeroplane view of the Tengger Sand-Sea, with the Bromo.

the existing conditions have been excluded, so that for the future an undisturbed continuance of the investigations of how these islands again get repopulated with plants and animals, is assured.

Some nature reserves also have been instituted in honour of great naturalists, such as the JUNGHUHN nature reserve near Lembang, above Bandoeng, which contains the tomb of the great botanist, and the RUMPHIUS nature reserve in Ambon, a green hill, from where one enjoys a beautiful view of the famous bay of Ambon. It is called after the great naturalist, whose books "Amboinsch Kruydboek" and "Amboinsche Rariteitkamer" may be considered to be universally known.

Last of all we have to mention that in Java many smaller nature reserves are to be found, which mostly consist of plots of forest, only some hectares large, containing trees which have been registered by the late Dr. KOORDERS, from 1890 until 1903, for the sake of the botanical investigations of the Javanese species of trees.

III. OUTLINE OF THE MORE IMPORTANT NETHERLANDS-INDIAN NATURE RESERVES. [1])

1. JAVA

BANTAM

Oedjoeng koelon and **Prinsen Island.**

Reserved: November 1921.

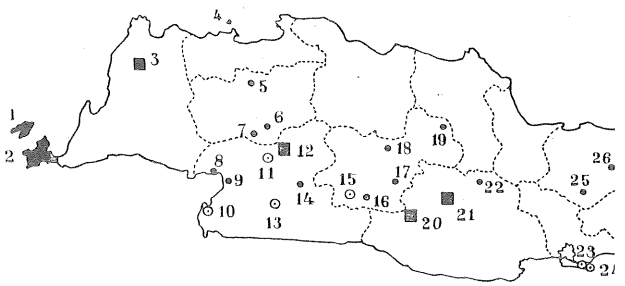
Site: The peninsula Oedjoeng koelon, in the southwest of the residency of Bantam; and Prinsen Island, situated in the Sunda Straits, northwest of Oedjoeng koelon.

Area: Oedjoeng koelon is estimated at 37,500 hectares; Prinsen Island at 17,500 hectares.

Reason for protection: In the first place, this peninsula, entirely clad with primeval forests and uninhabited, serves as a reservation for two animals threatened with extermination in Java, namely the Javanese rhinoceros *(Rhinoceros sondaicus)* and the banteng *(Bos sondaicus,* Fig. 9); moreover, many tigers and deer may be found here. Deer also occur in great numbers on Prinsen Island, where also the natural conditions have been entirely maintained. Besides, as both areas are wholly covered with primeval jungle, they may be considered as general reservations for flora and fauna of the lowlands of West Java, whilst especially Oedjoeng koelon is famous for its beautiful scenery.

Route: From the landside Oedjoeng koelon is practically inaccessible, as a strip of marsh divides the peninsula from the mainland. One reaches Oedjoeng koelon and Prinsen Island easiest from Laboean, by boat. The

[1]) The names are mainly according to the Dutch spelling; "oe" has to be pronounced like "oo".



NATURE F

• smaller than 50 ha (125 ac

Bantam
1. Prinsen Island
2. Oedjoeng koelon
3. Lake Danoe

Batavia
4. Klein Kombuis

Buitenzorg
5. Depok
6. Artjadomas
7. Lake Tjiletoeh

West Priangan
8. Soekawajana Palaboehanratoe
9. Tangkoebanprahoe Palaboehanratoe
10. Tjibanteng
11. Tjimoengkat
12. Tjibodas Gn. Gede
13. Takoka
14. Tjadas Malang

Central Priangan
15. Telaga Patenggang
16. Tjigenteng Tjipanji
17. Malabar
18. Junghuhn natu monument
19. Tomo

East Priangan
20. Crater of the I dajan
21. Telagabodas
22. Koorders natu serve

South Banyuma
23. North Noesa K bangan
24. East Noesa Ka bangan

Tegal
25. Telaga Randjen
26. Goetji

Pekalongan
27. Moga
28. Tjoeroeg Bengk
29. Peson-Soebah I
30. Oelolanang Ket boeng

distance from Laboean to the lighthouse on Java's Eerste Punt is some 80 kilometres.

Lake Danoe (Pl. 5).

Reserved: November 1921.

Site: Lake Danoe, with its surrounding marshes, up to the boundaries of the cultivated lands of the neighbouring native villages; situated between Gunong Gede and Gunong Karang, in the northwest of Bantam.

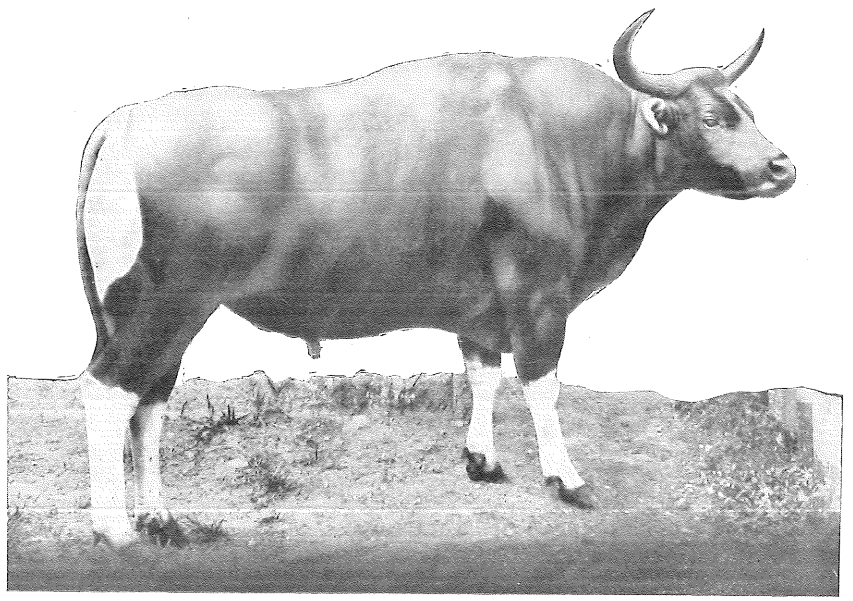


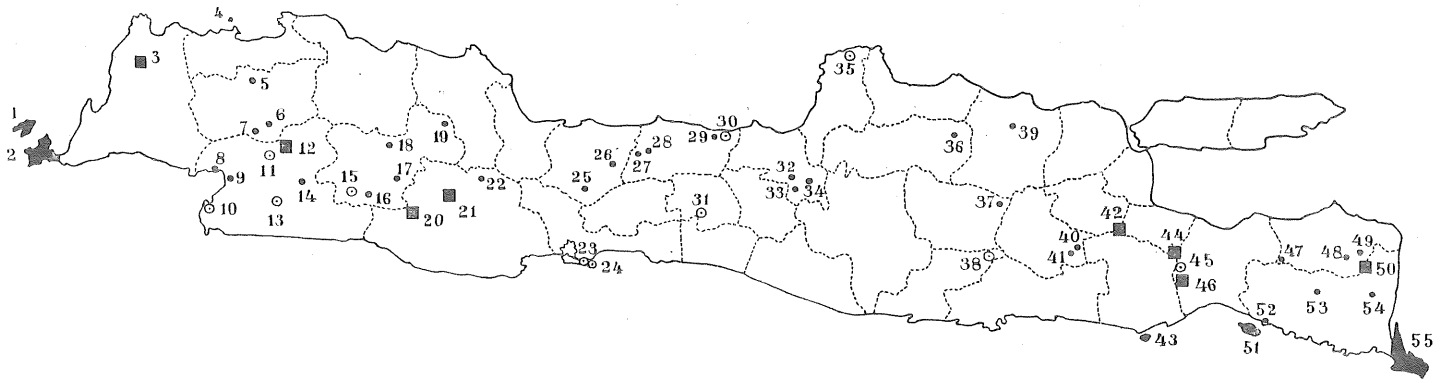
Photo G. A. Alberts

Fig. 9. The Javanese Wild Ox or Banteng.

Area: about 2500 hectares.

Reason for protection: Lake Danoe, at an altitude of about 90 metres, is especially remarkable for its fresh-water swamp forests and for the greater part is overgrown with high reed-grass *(Coix palustris)*. Amongst the rare or remarkable trees of this marsh we may mention *Alstonia spathulata*, the *Ficus retusa* with its broom-shaped aerial roots, and some other plants with aerial roots, such as *Elaeocarpus* and *Clo-*

JAVA
NATURE RESERVES



NATURE RESERVES OF JAVA

• smaller than 50 ha (125 acres); ⊙ 50 to 500 ha (1250 acres); ■ larger than 500 ha.

Bantam

1. Prinsen Island
2. Oedjoeng koelon
3. Lake Danoe

Batavia

4. Klein Kombuis

Buitenzorg

5. Depok
6. Artjadomas
7. Lake Tjiletoeh

West Priangan

8. Soekawajana Palaboehanratoe
9. Tangkoebanprahoe Palaboehanratoe
10. Tjibanteng
11. Tjimoengkat
12. Tjibodas Gn. Gede
13. Takoka
14. Tjadas Malang

Central Priangan

15. Telaga Patenggang
16. Tjigenteng Tjipanji
17. Malabar
18. Junghuhn nature monument
19. Tomo

East Priangan

20. Crater of the Papandajan
21. Telagabodas
22. Koorders nature reserve

South Banyumas

23. North Noesa Kambangan
24. East Noesa Kambangan

Tegal

25. Telaga Randjeng
26. Goetji

Pekalongan

27. Moga
28. Tjoeroeg Bengkawah
29. Peson-Soebah I and II
30. Oelolanang Ketjoeboeng

Wonosobo

31. Pringombo I and II

Semarang

32. Geboegan Gn. Oengaran
33. Sepakoeng Telamaja
34. Getas

Koedoes

35. Keling I — III

Blora

36. Tjabak I and II

Madioen

37. Klangoen Saradan

Ponorogo

38. Gn. Pitjis and Gn. Si Gogor

Bodjonegoro

39. Nglirip cave

Kediri

40. Besowo
41. Manggis

Modjokerto

42. Ardjoena Lalidjiwo

Malang

43. Island of Sempoe

Pasoeroean

44. Tengger Sand-sea

Probolinggo

45. Ranoe Panie Regoeloe
46. Ranoe Koembolo

Bondowoso

47. Soengi Kolboe
48. Pantjoer Idjen I and II
49. Tjeding
50. Kawah Idjen

Djember

51. Noesa Baroeng
52. Watangan Poeger I—IV
53. Tjoramanis Sempolan I — VIII
54. Djanggangan Rogodjampi I and II
55. Djati Ikan and Poerwo

Appendix IV

Export of wild animals and their products from the Netherlands Indies.

Export of:	Living animals		Skins		Deer skins		Deer antlers		Ivory (raw)		Rhinoceros horn	
	Pieces	Value [1]	Kilos	Value	Pieces	Value	Kilos	Value	Kilos	Value	Kilos	Value
1918: Total	**69,280**	**18,823**	**213,641**	**106,938**	**166,992**	**165,386**	**36,331**	**47,594**	**309**	**2,973**	**—**	**—**
Java & Madura	66,644	9,341	53,440	26,723	—	—	—	—	—	—	—	—
Other islands	2,636	9,482	160,201	80,215	166,992	165,386	36,331	47,594	309	2,973	—	—
1919: Total	**7,845**	**11,565**	**376,091**	**338,341**	**225,487**	**302,867**	**127,987**	**255,974**	**357**	**3,602**	**49**	**9,320**
Java & Madura	—	—	210,345	189,123	—	—	4,200	8,400	—	—	—	—
Other islands	7,845	11,565	165,746	149,218	225,487	302,867	123,787	247,574	357	3,602	49	9,320
1920: Total	**4,103**	**7,272**	**253,535**	**304,251**	**124,418**	**225,710**	**77,060**	**103,261**	**263**	**3,432**	**70**	**17,447**
Java & Madura	—	—	99,979	119,949	—	—	75	101	—	—	—	—
Other islands	4,103	7,272	153,556	184,302	124,418	225,710	76,985	103,160	263	3,432	70	17,447
1921: Total	**79,103**	**22,114**	**199,666**	**343,373**	**70,963**	**133,049**	**64,503**	**86,434**	**276**	**3,325**	**38**	**10,609**
Java & Madura	74,695	15,694	68,773	118,238	—	—	—	—	—	—	—	—
Other islands	4,408	6,420	130,893	225,135	70,963	133,049	64,503	86,434	276	3,325	38	10,609
1922: Total	**156,851**	**29,659**	**242,769**	**133,673**	**75,441**	**97,243**	**75,799**	**43,002**	**435**	**4,176**	**68**	**25,941**
Java & Madura	146,966	16,071	87,820	48,301	—	—	1,066	1,150	—	—	—	—
Other islands	9,885	13,588	154,949	85,372	75,441	97,243	74,733	41,852	435	4,176	68	25,941
1923: Total	**219,471**	**38,241**	**304,026**	**125,034**	**179,023**	**150,244**	**95,326**	**71,298**	**465**	**5,021**	**39**	**13,246**
Java & Madura	200,836	9,212	129,621	51,884	—	—	1,094	5,335	130	1,404	8	2,000
Other islands	18,635	29,029	174,405	73,150	179,023	150,244	94,232	65,963	335	3,617	31	11,246
1924: Total	**263,067**	**51,899**	**331,549**	**131,254**	**158,646**	**122,938**	**92,506**	**57,482**	**457**	**4,378**	**24**	**10,559**
Java & Madura	253,488	10,793	168,079	58,845	—	—	1,124	1,740	—	—	—	—
Other islands	9,579	41,106	163,470	72,409	158,646	122,938	91,382	55,742	457	4,378	24	10,559
1925: Total	**367,845**	**75,628**	**341,112**	**303,938**	**77,808**	**61,648**	**57,549**	**71,989**	**—**	**—**	**16**	**5,131**
Java & Madura	351,561	19,640	201,094	239,813	1,974	869	103	180	—	—	—	—
Other islands	16,284	55,988	140,018	64,125	75,834	60,779	57,446	71,809	—	—	16	5,131
1926: Total	**—**	**45,057**	**156,490**	**771,761**	**101,611**	**75,736**	**95,393**	**92,591**	**334**	**3,489**	**22**	**6,824**
Java & Madura	—	5,892	25,736	648,465	785	482	80	70	61	530	—	—
Other islands	—	39,165	130,754	123,296	100,826	75,254	95,313	92,521	273	2,959	22	6,824
1927: Total	**—**	**51,947**	**187,834**	**2,546,919**	**77,215**	**60,715**	**81,634**	**79,996**	**466**	**3,460**	**26**	**4,351**
Java & Madura	—	8,735	63,313	2,367,975	2,688	1,581	77	590	286	1,450	—	—
Other islands	—	43,212	124,521	178,944	74,527	59,134	81,557	79,406	180	2,010	26	4,351

[1] Value in Dutch guilders.

Export of wild animals and their products form the Netherlands Indies.

Export of:	Manis scales	Bird-skins		Feathers		Edible birds-nests		Varanus skins		Tortoise-shell (raw)	
	value	pieces	value	kilos	value	kilos	value	pieces	value	kilos	value
1918: Total	**7,305**	**61,160**	**801,198**	**352**	**78,510**	**66,214**	**672,545**	**62,648**	**24,379**	**6,877**	**96,278**
Java & Madura	3,260	400	5,240	—	—	28,189	507,402	62,648	24,379	—	—
Other islands	4,045	60,760	795,958	352	78,510	38,025	165,143	—	—	6,877	96,278
1919: Total	**4,495**	**121.692**	**2,080,934**	**1,100**	**98.827**	**72,884**	**981 249**	**99,521**	**38,095**	**16,286**	**206,485**
Java & Madura	—	408	6,977	—	—	30,160	765,861	99,521	33,095	—	—
Other islands	4,495	121,284	2,073,957	1,100	98,827	42,724	215.388	—	—	16,286	206,485
1920; Total	**4,747**	**61.892**	**1,758,969**	**257**	**80.621**	**113,675**	**1,360,985**	**82,939**	**31,620**	**15,682**	**219,548**
Java & Madura	—	—	—	—	—	30,058	975,158	82,939	31,620	—	—
Other islands	4,747	61,892	1,758,969	257	80,621	83,617	385,827	—	—	15,682	219,548
1921: Total	**940**	**97,938**	**1,646,794**	**560**	**80,132**	**154,108**	**1,063,230**	**70,994**	**23,700**	**26,451**	**122,617**
Java & Madura	—	172	2,901	10	4.205	115,937	848,209	70,994	23,700	—	—
Other islands	940	97.766	1,643,893	550	75,927	38,171	215.021	—	—	26,451	122,617
1922: Total	**1,115**	**68,593**	**1,016,133**	**1,096**	**290,757**	**88,421**	**1.022.533**	**94,261**	**24,803**	**7,256**	**85,187**
Java & Madura	—	159	2,354	—	—	47,302	791 833	94,261	24,803	—	—
Other islands	1.115	68,434	1,013,779	1,096	290,757	41,119	230,700	—	—	7,256	85,187
1923: Total	**4,348**	**61,796**	**635,116**	**5,702**	**393,677**	**78,648**	**771.897**	**179,661**	**132,252**	**22,569**	**99,936**
Java & Madura	—	—	—	—	—	37,961	543,975	179,661	132,252	—	—
Other islands	4,348	61,796	635,116	5,702	393,677	40,687	227,922	—	—	22,569	99,936
1924: Total	**9,564**	**59,013**	**757,431**	**1,082**	**340,553**	**76,063**	**783,228**	**190,617**	**224,758**	**19,923**	**205,069**
Java & Madura	—	—	—	—	—	38,580	583,750	190,510	224,373	—	—
Other islands	9,564	59,013	757,431	1,082	340,553	37,483	199,478	107	385	19,923	205,069
1925: Total	**10,275**	**29,069**	**449,037**	**1,066**	**585,575**	**73,402**	**782,976**	**464,499**	**545,507**	**21,579**	**217,649**
Java & Madura	3,693	2	45	1	200	37,078	597,079	459,540	535,376	—	—
Other islands	6.582	29,067	448,992	1,065	585,375	36,324	185,897	4,959	10,131	21.579	217,649
1926: Total	—	—	**43,250**	**253**	**41,670**	**111,405**	**808,493**	**657,056**	**741,087**	**16,317**	**186,379**
Java & Madura	—	—	215	—	—	71,176	654,656	625,330	697,603	14	100
Other islands	—	—	43,035	253	41,670	40,229	153,837	31,726	43,484	16,303	186,279
1927: Total	—	—	**36,239**	**2,145**	**31,298**	**109,310**	**822,913**	**458,592**	**1,017,656**	**7,796**	**109,558**
Java & Madura	—	—	810	28	100	63,973	663,782	375,279	867,923	465	7,961
Other islands	—	—	35,429	2,117	31,198	45,337	159,131	83,313	149,733	7,331	101,597

Export of wild animals and their products from the Netherlands Indies.

Principal countries of destination	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Living animals (pieces)										
Total	**69,280**	**7,845**	**4,103**	**79,103**	**156,851**	**219,471**	**263,067**	**367,845**	—	—
Netherland	—	38	—	—	7	279	773	9,967	—	—
Singapore	69,211	7,805	4,080	68,322	126,071	188,095	260,472	346,516	—	—
China & Honkong	—	—	—	8,700	30,664	31,060	—	—	—	—
Skins (kilos)										
Total	**213,641**	**376,091**	**253,535**	**199,666**	**242,769**	**304,026**	**331,549**	**341,112**	**156,490**	**187,834**
Netherland	—	8,562	10,171	18,863	—	8,945	18,306	15,381	5,004	10,408
France	—	19,811	13,895	7,557	18,095	—	—	24,661	7,176	22,495
Singapore	142,817	122,901	83,719	98,227	126,598	127,681	117,370	107,839	104,439	93,588
Penang	11,380	35,254	63,018	31,849	20,576	22,361	21,432	17,744	875	13,807
China & Honkong	—	5,180	5,819	—	8,752	19,559	20,596	13,704	8,896	8,585
United States	50,390	171,226	75,555	38,041	59,256	109,781	142,186	150,463	164	373
Deer skins (pieces)										
Total	**166,992**	**225,487**	**124,418**	**70,963**	**75,441**	**179,023**	**158,646**	**77,808**	**101,611**	**77,215**
Netherland	—	11,939	1,690	4,750	—	5,001	—	—	—	—
Singapore	55,059	45,698	39,172	20,139	38,244	53,103	23,428	23,817	19,264	20,383
China & Honkong	11,980	72,340	—	1,890	1,763	4,545	6,133	2,040	4,130	19,319
Japan	32,779	6,390	5,982	11,852	625	10,956	14,915	5,000	11,716	2.355
United States	65,622	88,169	74,872	31,062	34,439	104,475	104,596	43,777	65,248	33,502
Deer antlers (kilos)										
Total	**36,331**	**127,987**	**77,060**	**64,503**	**75,799**	**95,326**	**92,506**	**57,549**	**95,393**	**81,634**
Netherland	—	37,462	18,490	1,966	3,992	10,224	4,509	19,586	6,115	6,765
Singapore	6,412	4,379	7,445	4,446	5,406	2,010	2,415	2,755	11,736	3,581
China & Honkong	22,108	68,555	35,185	38,881	37,920	62,998	58,751	19,540	48,633	43,493
Japan	7,534	12,615	15,306	9,085	25,751	5,286	14,702	1,436	19,551	—
Ivory (raw) (kilos)										
Total	**309**	**357**	**263**	**276**	**435**	**465**	**457**	—	**334**	**466**
Singapore	—	164	106	65	95	—	242	—	168	264
Penang	119	159	—	141	166	243	151	—	—	144
China & Honkong	94	—	—	—	140	40	—	—	—	—

Export of wild animals and their products from the Netherlands Indies.

Principal countries of destination:	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Rhinoceros horn (kilos)										
Total	—	49	70	38	68	39	24	16	22	26
Singapore	—	31	65	38	59	24	13	6	14	21
China & Honkong	—	10	—	—	—	10	11	9	—	—
Bird-skins (pieces)										
Total	61,160	121,692	61,892	97,938	68,593	61,796	59,013	29,069	—	—
Netherland	17,775	25,999	16,819	39,525	39,897	21,425	24,297	22,228	—	—
England	—	2,925	10,283	7,113	297	—	—	—	—	—
France	24,446	59,418	34,135	39,406	23,235	36,860	29,611	5,288	—	—
Singapore	18,546	32,041	271	376	—	—	114	38	—	—
Feathers (kilos)										
Total	352	1,100	257	560	1,096	5,702	1,082	1,066	253	2,145
Netherland	307	106	67	106	442	349	594	891	22	2,030
France	15	868	177	296	379	5,323	422	166	80	86
Birds-nests (edible) (kilos)										
Total	66,214	72,884	113,675	154,108	88,421	78,648	76,063	73,402	111,405	109,310
Singapore	64,054	69,680	109,611	151,421	84,656	75,995	64,464	64,632	103,053	91,589
China & Honkong	1,299	1,752	2,170	1,550	1,821	1,857	6,822	7,783	7,426	16,500
Varanus skins (pieces)										
Total	62,648	99,521	82,939	70,994	94,261	179,661	190,617	464,499	657,056	458,592
Netherland	—	8,405	19,551	15,737	33,333	95 574	80,067	101,087	95,946	81,812
England	—	—	—	—	—	39,332	49,854	257,304	433,562	241,317
France	—	25	—	—	7,475	17,425	25,618	87,436	107,539	85,032
Japan	62,647	91,091	63,354	54,900	49,355	20,770	26,860	6,161	2,808	—
Tortoise-shell (raw) (kilos)										
Total	6,877	16,286	15,682	26,451	7,256	22,569	19,923	21,579	16,317	7,796
Netherland	—	2,117	6,248	582	—	—	2,274	4,115	3,473	1,508
Singapore	1,038	5,925	4,557	2,610	1,838	7,198	3,728	11,932	2,043	1,971
Japan	5,706	7,293	2,295	22,475	3,557	14,296	11,772	4,704	9,465	3,457