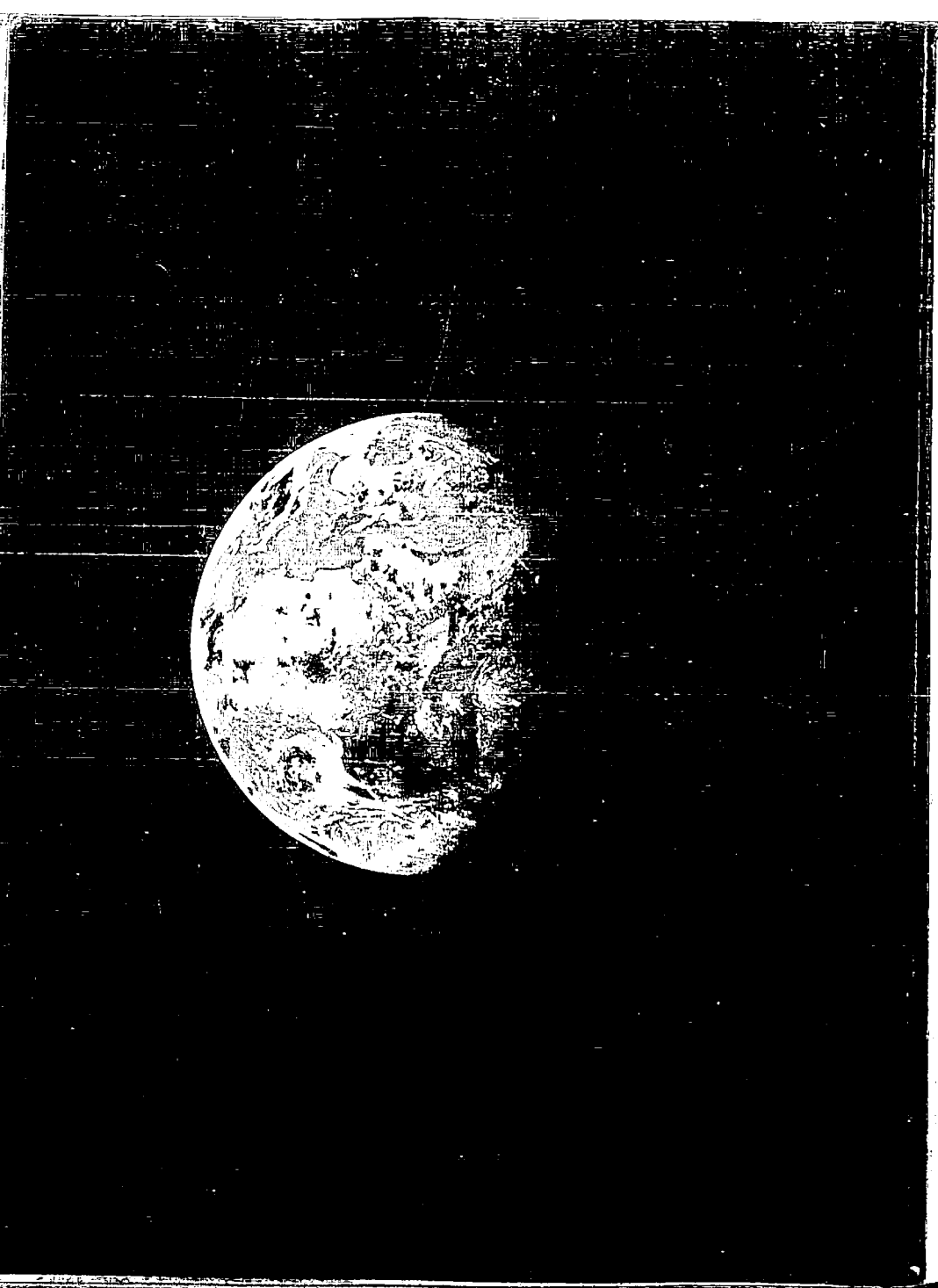

Wildlife Crisis

H.R.H. The Prince Philip, Duke of Edinburgh,
and James Fisher

Forewords by H.R.H. The Prince of the Netherlands and Peter Scott
Epilogue by Stewart L. Udall

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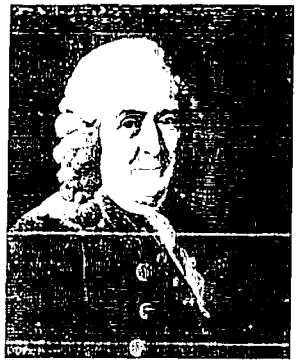


Karl von Linné (Carolus Linnaeus) when Professor of Botany at Uppsala in Sweden, painted by A. Roslin.

John Ray, the father of modern field natural history.

of language, poets have contemplated tangled banks. Come to that, men have contemplated tangled banks ever since men were men. The first men were naturalists; they had to be.

By analogies with the primitive peoples of today and by the study of the cave-paintings and other artistic remains of the Stone Age peoples of the past, it is possible to guess to a certain extent how human understanding of the bank's tangle grew through the ages.

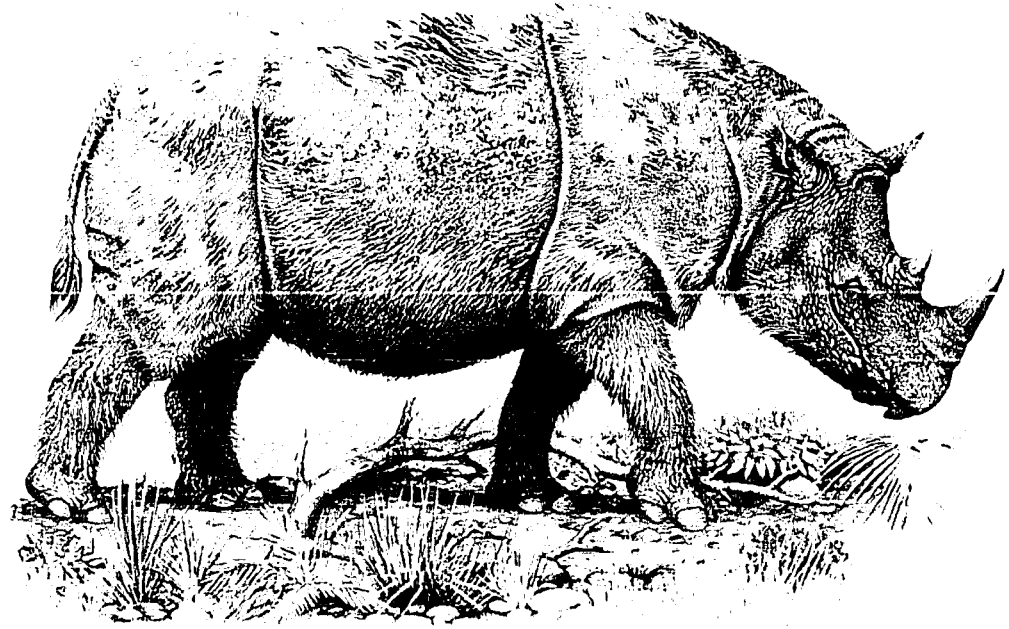
Some Stone Age naturalists were brilliant hunters and artists, and some Stone Age primitive peoples of recent years have been clever enough to discover for themselves and hand down without the benefit of writing, such complicated truths as the transmission of disease from wild animals to humans and their domestic stock, or the link between unusual animal movements and conditions of drought or famine.

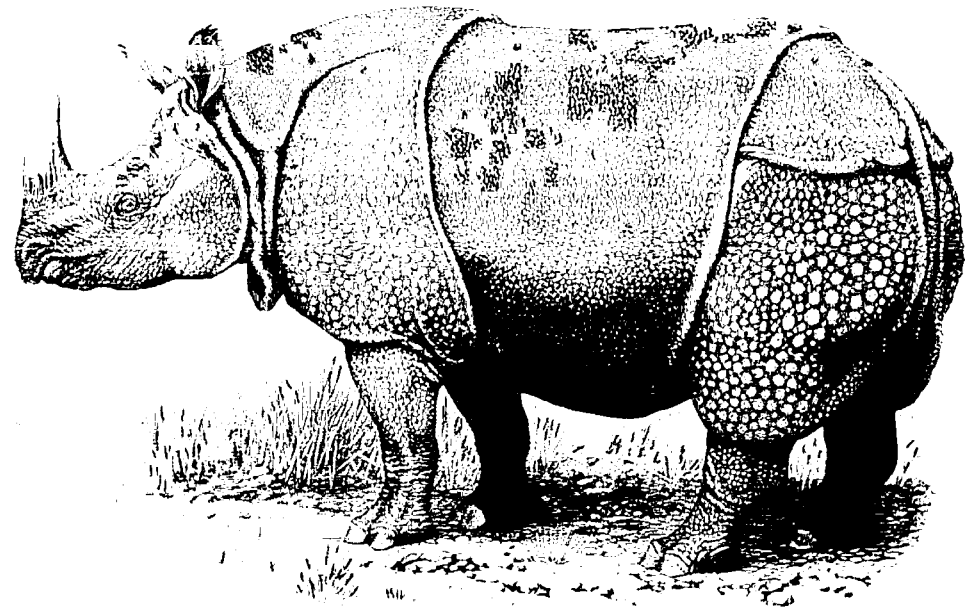
The Mesopotamians, and more particularly the Greeks, had a vast knowledge of animal and plant lore. In the Dark Ages nature-study flourished where much other culture almost perished. Yet modern natural history's true foundations were no more than a blueprint at the time of the Renaissance, and indeed afterwards. The scaffolding did not really get lashed up until the middle of the eighteenth century, with the publication of the first edition of Carolus Linnaeus's *Species Plantarum* in 1753 and the tenth edition of his *Systema Naturae* in 1758. These two books by the great Swedish naturalist have been adopted as the starting points for modern botanical and zoological naming.

Without sound naming, natural history cannot exist. Based on the method proposed by Linnaeus, and his "binomial" system of noun and adjective (the noun being the genus name and the two together the species name), proper descriptions and names, internationally acceptable, spread rapidly through the civilized world, and were adopted by scientists and literate amateurs wherever they flourished. Where not adequate, the nomenclature was revised, refined and most copiously added to.

Linnaeus, like all great scholars, built upon the past; in particular upon the work of one towering genius of botany and zoology, John Ray (1628–1705), who is rightly known as the father of modern natural history. Ray's and Linnaeus's works, which enjoyed a wide circulation, inspired many amateurs of the eighteenth and early nineteenth centuries. These men were amateurs in the strict sense of the word (i.e. enthusiasts), gentlemen of education and more or less leisure, who travelled and marvelled and wrote of the world around them. As early as the time of Linnaeus there was a recognizable division into two streams: field men and museum men. Linnaeus himself, an indefatigable field man, was almost the exception that proved the rule.

It was the museum men, on the whole, who dug the quarry from which Darwin (another fine field man, incidentally) excavated his noble hypotheses, which gave men a new, searing, and at the time they were first proposed, a frightening understanding of nature. But it was the other stream, the field men and poets and artists, who aroused the world's *love* for nature, whose golden words and pictures created the sense of what we sometimes now call





Facing
The great Indian rhinoceros now has a world population of *c.* 740 in a dozen groups in India, Nepal and Pakistan mostly living in official sanctuaries under strict protection.

Russian Paradise

The skilful naturalists of the Soviet Union can offer us an historical picture of the progress of nature in their vast Eurasian country that is very similar to that in Western Europe. Their busy palaeontologists are unearthing (literally) a picture of Late Pleistocene big-game disappearance of Western European style: no woolly rhinoceros date younger than in Western Europe is yet available, though Russia could well have been the last refuge of this originally northern Asian species.

A steppe rhinoceros *Dicerorhinus hemitoechus* from the Jana River may have died out in Late Würmian times. The youngest woolly mammoth radiocarbon date I can find, in a country where at least the tusks (and often some of the other bones) of over 100,000 mammoths have been dug (mostly for the ivory trade) is 11,450 ±250 B.P. from Taimyr. A mammoth from Kunda has a date of 9780 ± 260 B.P. on tusk which may be too young. Just as in Austria, the giant deer survived in the Black Sea area until Iron Age times of 700–500 B.C.

Soviet zoologists are enthusiastic members or correspondents of IUCN's Survival Service Commission and are jealous guardians of Russia's surviving big-game and other relict animals. The present network of conservation land in the country consists of a chain of fifty-one nature reserves some of which are of national park quality and size. One of the earliest of these is Lagodekhi in Georgia, which dates from 1912. In some reserves experiments are conducted with the domestication of animals, among them the eland of Africa.

Reserves with endangered – i.e. currently listed in the IUCN's Red Data Book – animals in their fauna include:

In the RSFSR, Sikhote-Alin with tiger, goral and leopard; Caucasus with European bison and leopard; Oka with bison; Kiedrowaia Pad' with leopard; Soupoutinsk with tiger; and Priosko-Terrasny with bison.
In Kazakhstan, Ak-ov-Djebogly with snow leopard.
In Bielorussia, Bielovieja on the Polish border marching with Poland's Bialowieza Forest, with bison.
In Turkmenia, Badkhyz with onager and leopard.
In the Ukraine, Askania Nova with introduced and managed onager, Przewalski horse and bison.
In Uzbekhistan, Zaamin with snow leopard.

Part of the headquarters herd of the European bison now conserved and managed in some forests of Poland near the Russian border

Asian Paradise

The earliest fossil man in Asia is *Homo erectus*, Java man, originally described from Trinil in Java as *Pithecanthropus erectus* by Dubois in 1894. He also has been found in deposits at Modjokerto and Sangiran in Java, which are of Günzian or Cromerian times (p. 141). These deposits are earlier, therefore, than the Mindelian deposits at Choukoutien near Peking where Black identified Peking man, *Sinanthropus pekinensis*, in 1927. Most modern anthropologists put Peking man in the same species as Java man, *Homo erectus*. It seems likely that by Mindelian times this ancestral species of ours extended in range from China to Western Europe and North Africa.

Another Chinese fossil was described by von Koenigswald in 1933 as *Gigantopithecus blacki* on the evidence of a molar tooth which came from a Hong Kong drugstore. A very recent paper by Pilbeam suggests with good evidence from new material that *Gigantopithecus* was not a man, and not a member of the family Hominidae, but a member of a group the Dryopithecinae, which is an extinct subfamily of the Pongidae, the family of the living great apes.

Homo erectus appears to have been the only true man in Asia in Early Pleistocene times, and an evolution to Sapient man in Asia appears to parallel that in Europe, though Lantian man of Konwanling in Shensi is not identical with what may be his evolutionary counterpart, Neanderthal man.

It is not yet certain when man first colonized Japan. The earliest radiocarbon dating I can find is Late Würmian 16,150 ± 550 B.P. from a Palaeolithic culture horizon at Lake Nojiri. It is probable that when man arrived a Pleistocene big-game fauna, including elephant, giant deer and perhaps even the extinct Japanese race of tiger still flourished, as well as wild horse.

These are now extinct in Japan, but we cannot on the evidence be sure that their extinction was due to overkill. As the Japanese evolved in the Flandrian period through Neolithic and Metal Age cultures they seem to have developed an attitude to nature not unlike that of a counterpart archipelago in the eastern Atlantic, Britain and Ireland – with the same idea of analysis for analysis' sake and conservation for conservation's sake. This was fostered largely by the aristocracy and landowning classes, but based on firm popular support, particularly during the Tokugawa Shogunate from 1615 to 1865. After the Meiji restoration in 1867 animal protection virtually collapsed; but the first national parks were created in 1931 and the whole conservation system was strengthened by a new law of 1957.

Today Japan has twenty-three national parks of IUCN standard, twenty-four quasi-national parks, 210 prefectural (county) parks and no fewer than 1,148 nature reserves which are at least equivalent to the Sites of Special Scientific Interest of the British Nature Conservancy.

Several of the Japanese national parks house Red Data Book animals, such as Bandai-Asahi, Jo-Shin Etsu Kogen, Chubu Sangaku, Nikko, Chichibu-Tama, Towada-Hachimantai, Yoshino-Kumano, Hakusan, Minami Alps and Rikuchu Kaigan, all with the

Orang utan, figured by Josette Gourley, the greatest of the Asian anthropoid apes, under serious human pressure in its last strong holds in Sumatra and Borneo.

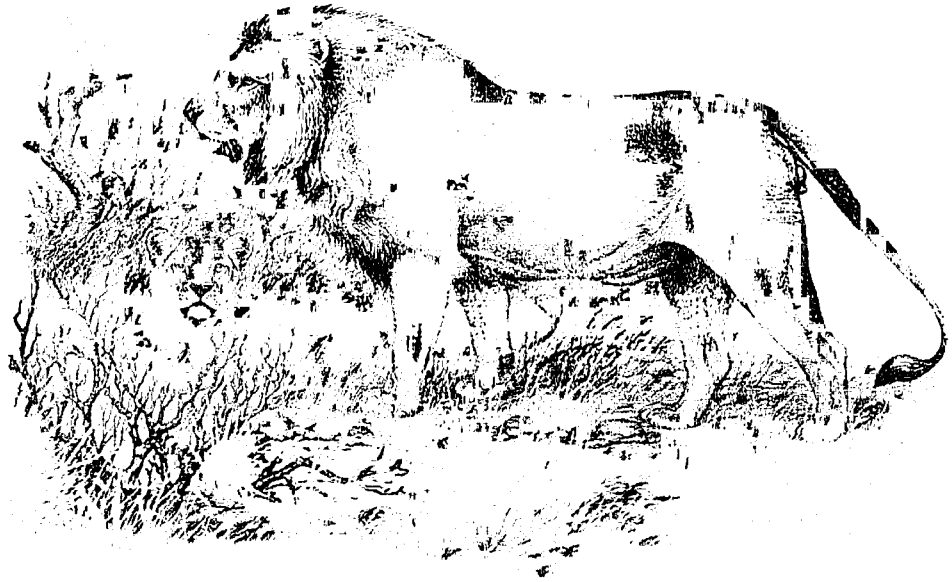
The Asiatic race of the lion, surviving only in India, mainly in the Gir Forest of Kathiawar, this relict subspecies could be rehabilitated by a WWF-aided programme.

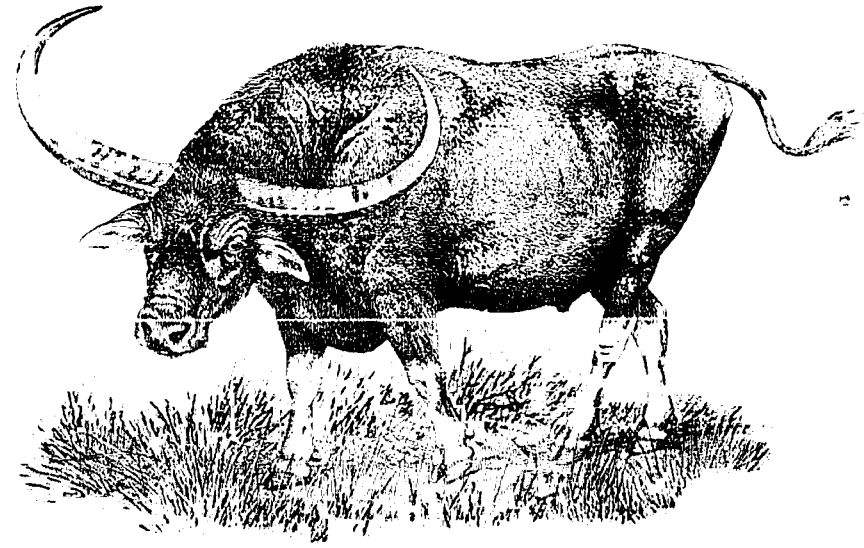
Japanese serow, and Fuji-Hakone-Izu with the Japanese race of the ancient murrelet, and Shiretoko where the Japanese race of the California sea lion lately survived.

Though it is aware that recent wild animal protection laws have been passed in mainland China, IUCN has been unable to obtain from the Chinese People's Republic any data about continental national parks and nature reserves. The Government of Taiwan (Formosa), however, reports three reserves inherited from the conservation-minded prewar administration by Japan. These are the Mount Yangming National Park (1936) and the reserve of the Taroko Gorge (1937, which shelters the Red Data Book Swinhoe's pheasant) and Mount Ali and Mount Morrison (1936).

Information from South Vietnam indicates projects to designate a national park, a forest park, four nature reserves and seven hunting reserves. Laos likewise has only projects at this stage, for four national parks. Since 1963 Cambodia has designated and administered the Angkor Wat area as a national park, and has set up six nature reserves, and some 200 forest reserves under the Water and Forest Service. Since 1962 Thailand has established nine national parks administered by the Royal Forest Department. Those with Red Data Book animals are Khao Yai (tiger), Khao Salob (tiger, Sumatran rhinoceros) and Khao Luanga (Sumatran rhinoceros).

In Malaysia there are two national parks in Malaya, Taman Negara and Templer. In Borneo Sabah has the famous naturalists' mountain, Kinabalu, as a national park and Sarawak has Bako, Taman Negara has rhinoceros and tiger; Templer has tiger; Kinabalu has orang utan, and sometimes the Sumatran rhinoceros. Malaya also has one game reserve; and Sarawak is planning no less than ten national parks.





The wild form of the Asiatic buffalo, here figured by Helmut Diller, has a population of 2 000 or less in a fractionated range in India and Nepal.

Indonesia has a big reserve system, with twenty national nature reserves in Java, including the Panjitan Nature Reserve at Udjung Kulon (the last stronghold of the Javan rhinoceros); twelve in Sumatra, including Indrapura (Sumatran rhinoceros, Sumatran race of serow) and Rafflesia Serbodjadi (orang utan); two in Kalimantan in Borneo, including Mandor (proboscis monkey); six in Celebes, including Tangkoko (maleo – a mound-building game bird – and anoa – a dwarf ox), Panna (maleo), and Tanggala and Bantimurung (anoa); and one in the Moluccas. Indonesia has also designated fifty-three other reserves and twenty-two more nature parks.

The Philippines, with a very special fauna and flora, have long been a problem area for conservation. Indigenous specialities such as the monkey eating eagle and the tamaraw are in grave danger. Forest clearance has led to the extinction or relict status of several bird species, especially on Cebú. Of the thirty-six national parks on the Government's list in 1967 twenty-three were found acceptable to IUCN* under its rules. On Mindanao Mount Apo is, or was, an headquarters of the rare monkey-eating eagle.

Burma has one important nature reserve, which it calls a "game sanctuary" at Pidaung in the north, which has a tiger population. IUCN does not log "above the line" eleven rather small hunting-reserves.

India's oldest national park is Corbett (formerly Hailey) National Park in Uttar Pradesh founded in 1935; she now has four others in Bihar, Maharashtra and Madhya Pradesh. Wildlife-sanctuaries go back to 1908 when Kaziranga in Assam was so designated. This large national nature reserve may soon become a national park; among other Red Data Book animals it houses the great Indian rhinoceros, the barasingh and about a third of the world population of the wild Asiatic buffalo.

In all, the Indian Board for wildlife has eighty wildlife sanctu-

* IUCN has its own rules of categorization of areas designated by countries as national parks, nature reserves, etc. An area that IUCN accepts will often be referred to in the following pages as "main-stream".

aries of which Kaziranga and eight others rate full recognition by IUCN as mainstream nature reserves. Red Data Book mammals guarded by the others and some of the national parks include great Indian rhinoceros at Manas in Assam and Jaldapara in West Bengal, Asiatic buffalo at Manas, the Asiatic race of lion (virtually the entire world population) at Gir in Gujarat and the barasingh at Kanha National Park in Madhya Pradesh. The rare hangul race of the red deer is guarded by a wildlife sanctuary at Dachigam in Kashmir which may soon be elevated to national park status. Many of India's wildlife sanctuaries and national parks have elephant, tiger and leopard populations and a rich bird fauna, and they are an effective insurance of the perpetuation of India's big game.

Up to 1967 only two national parks in Pakistan reached the mainstream list of IUCN. Now, largely as a result of Guy Mountfort's missions and expeditions in 1966 and 1967, it looks as if, with WWF support, a positive conservation programme is now advancing in a vital sector of the subcontinent that is overgrazed, ecologically degraded and three quarters eroded.

With European and North American help, the Government of Pakistan is designing a new system of national parks and nature reserves in both West and East Pakistan and before long we can expect, under active conservation *management*, at least four NPs and five reserves to be set up in West Pakistan and at least three NPs and four reserves in East Pakistan.

The danger to wildlife in Pakistan through over-hunting, for food, fur, skins and the aviculture and zoo trade has been such that many animal species, notably ungulates and spotted cats, were being lately considered for the Red Data Book. Pakistan has now prohibited the export of the skins of *all* wild animals, showing an initiative that should be copied by all countries with endangered wildlife – which means, today, most countries of the world. Pakistan is now pro-rhino, pro-tiger, pro-crocodile and pro-life in general, and developing the idea that enlightened tourist-orientated improvements to its national park system are good for the national economy as well as for wildlife. There will be cooperation with India, for instance, over the stocking of the improved Sunderbans Reserve in East Pakistan with great Indian rhinos from India's Kaziranga National Park not far away up the Brahmaputra.

Nepal has, for more than a decade, taken a positive conservationist attitude to its national natural treasures and looks after two fine sanctuaries through its Forest Department. These are Sukla Phanta in the Kanchanpur district of the Terai region of the Ganges Plain, which still has a fine community of big game, and the Chitawan in the Rapti Valley. The Chitawan Sanctuary contains the second largest great Indian rhinoceros population in the world. The status of the rhino here was seriously threatened by farming developments between 1959 and 1961; but now no less than 4,000 people have been rehoused and refarmed in other parts of Nepal, and the rhinos have free range over about 76,000 hectares, guarded by nearly 200 trained wardens and officers.

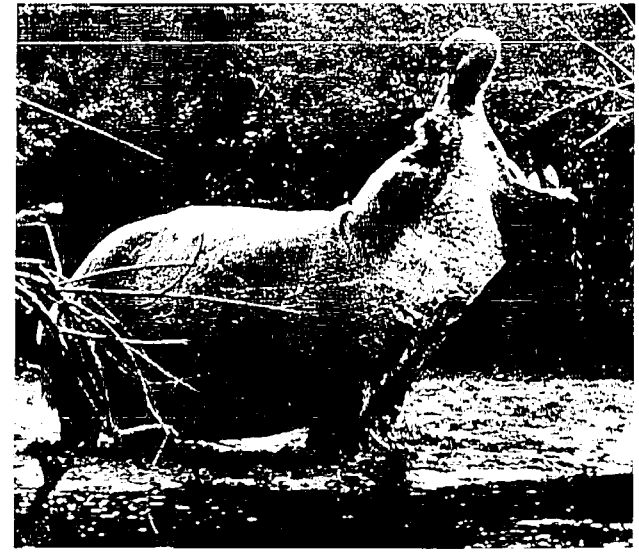
Afghanistan has no national parks or national nature reserves. Iran and Iraq had nothing that qualified for the IUCN mainstream list in 1967. But the Persians are refining their protection

laws and foresee the deployment of protected conservation areas of which a model has been already set up in the northeast and named after H.I.M. the Shah. The Iraqi laws also foresee a reserve system; but they have not got one as yet.

Middle and Near East Paradise

Iran and Iraq belong to the Fertile Crescent, where, as the last Ice Age came to an end, man first invented civilization as we know it. Remains at Jericho, from Jordan's Mesolithic past, have now been radiocarbon dated back to 11,166 ± 107 B.P.; Jericho must rank as the oldest known city in the world.

The archaeologists and palaeontologists have worked together for years now, on the vast array of fossil man and his cultures and the animals he lived with, preyed on and domesticated. The oldest human remains yet discovered in the Middle East are a few small fragments from Tell Ubeidiya in the Central Jordan Valley just south of the Sea of Galilee, associated with an archaic pebble industry and the bones of some thirty-seven species of mammals, at least thirty of which are extinct. These included Lower Pleistocene spectaculars like an ancient species of sabretooth, the European zebra, the primitive horse *Hipparion*, the Etruscan rhinoceros, the hippopotamus, a camel, a giraffe, the ancient ox *Leptobos* and antelope. The date of this famous deposit remains to be worked out, but it is very old indeed.



Hippopotamus photographed in the Queen Elizabeth Park, Uganda, by Donald Paterson

A token of survival of the great Pleistocene big game in Africa is this African elephant herd at Nyeri in Kenya, photographed by Arthur Rothstein

which does not hinder the main antelope population from keeping within the limitations of its feed. Lions are skilful killers, and kill only when hungry; but they are not skilful enough to be over-killers. Humans *are* skilful enough; so, like all good Western sportsmen, they have to ration and plan their take. They have to make rules against overkill and observe and refine those rules. This is real conservation, and it is being gradually, carefully and often tentatively deployed in Africa.

It is often said, and has been so said for years, that the only place to understand what a Pleistocene fauna looks like is in Africa, and that the only place to see one now is in an African national park. The origin of the deployment of African national parks was in African colonial times, and it was a sign that the era of the gun demanded the designation, dedication and management of conservation land as part of the self-denying ordinance that was essential for the gunners. National parks in Africa often started their evolution as game parks. As they proliferated, they got results; but they cannot be said to have cured overkill in the ordinary, undesignated rural game country. Here overkill is in some areas still the order of the day.

We can measure, all the same, the success of conservation, and the conservation skills of each African country, by their national parks and reserve systems. The emergent nations have mostly seized on conservation as a tool of the national economy, and have come to recognize the areas where their fauna still thrives in

Pleistocene style as part of the scenery that tourist pilgrims love, and happily pay to visit.

Let us sweep, then, through Africa with a glance at the conservation treasures, starting in Mauritania. Here the only reserve in the IUCN mainstream list is the Mauritanian Isles off the coast, where a fine seabird and waterbird fauna is looked after by the Water and Forest Service. Another coastal reserve is being developed at Lévrier Bay and an inland elephant reserve at El Agher.

In Senegal the Niokolo Koba National Park (1962) protects a rich Pleistocene fauna, including the endangered western race of the giant eland; and the Djoyol Nature Reserve (also set up in 1962) protects a community of wetland birds. Both are under the management of the Water and Forest Department, which is also developing bird reserves at Djeuss and Boundoum.

Little Gambia has no national parks or game reserves yet, but has designated eighty-eight forest parks. Portuguese Guinea has no mainstream IUCN areas but under hunting law has created three reserves.

Guinea has had, since 1944, the Nimba Mountains Nature Reserve, an international reserve which reaches over the Ivory Coast border, and remains, as in colonial days, under Water and Forest Department inspection. This is good chimpanzee country. Sierra Leone so far is still at the planning stage but may soon develop Konsilica National Park and three nature reserves. Liberia likewise is at the planning stage, has mapped three putative national parks, and may consider entering its own sector of the

Another Pleistocene animal of Africa, the black rhinoceros which has the highest population of the living rhinos. Photographed by Donald Paterson at Amboseli, Kenya

Nimba Mountains into the international nature reserve that Guinea and the Ivory Coast have maintained since 1944. Besides its share of the Nimba Mountains, Ivory Coast has a fine fauna and flora of full Pleistocene character totally protected in the Bouna Reserve; and is developing two other national parks and three other reserves.

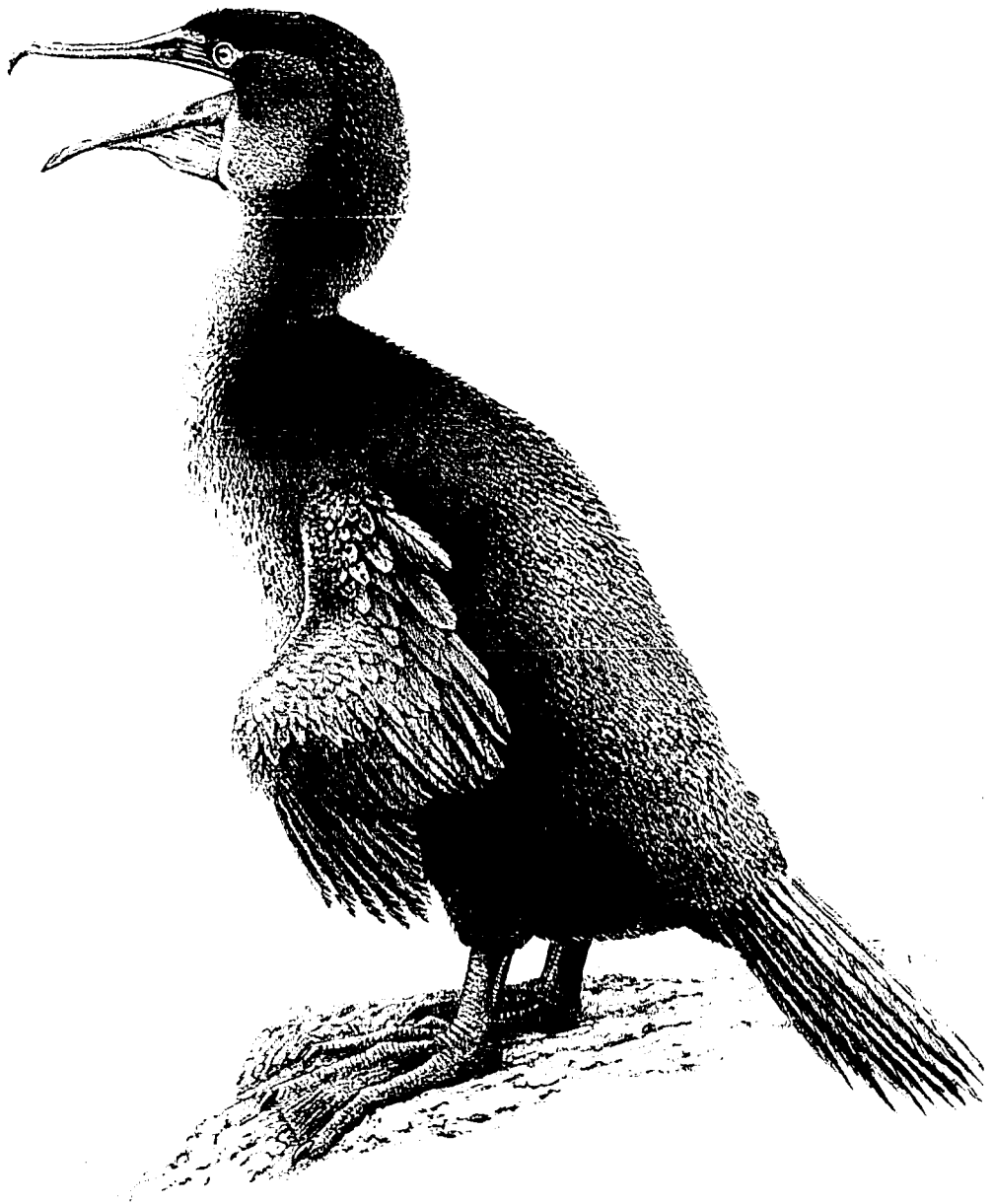
Mali's Boucle du Baoulé National Park is of true Pleistocene standards (p. 166) faunally (henceforth I shall refer to this as "P-type") and protects some Red Data Book western giant elands which are under severe hunting pressure in the rest of Mali. Besides this key area, Mali is developing five other nature reserves for total protection, and a largish forest reserve. Upper Volta, in its eastern corner, shares the W. National Park with Dahomey and Niger with a P-type fauna. This international park is truly internationally run and managed with a single permit system. Upper Volta is also developing six nature reserves.

In Ghana's Mole Game Reserve protection is complete under the Forest Division, with a P-type fauna; and another game reserve and five game sanctuaries are being developed. Togo has three IUCN mainstream areas at the Koué Forest Reserve (a P-type fauna with lowland gorillas and chimpanzees), the Kamassi Game Reserve (another gorilla sanctuary) and the Kéuan Game Reserve; Togo is also developing two more game reserves. Besides the W. National Park, Dahomey has the Boucle de la Pendjari National Park (also P-type) and is developing twenty-eight forest and twenty-two faunal lesser reserves. Niger's only National Park is W., where she is developing a northwest game reserve extension with total protection.

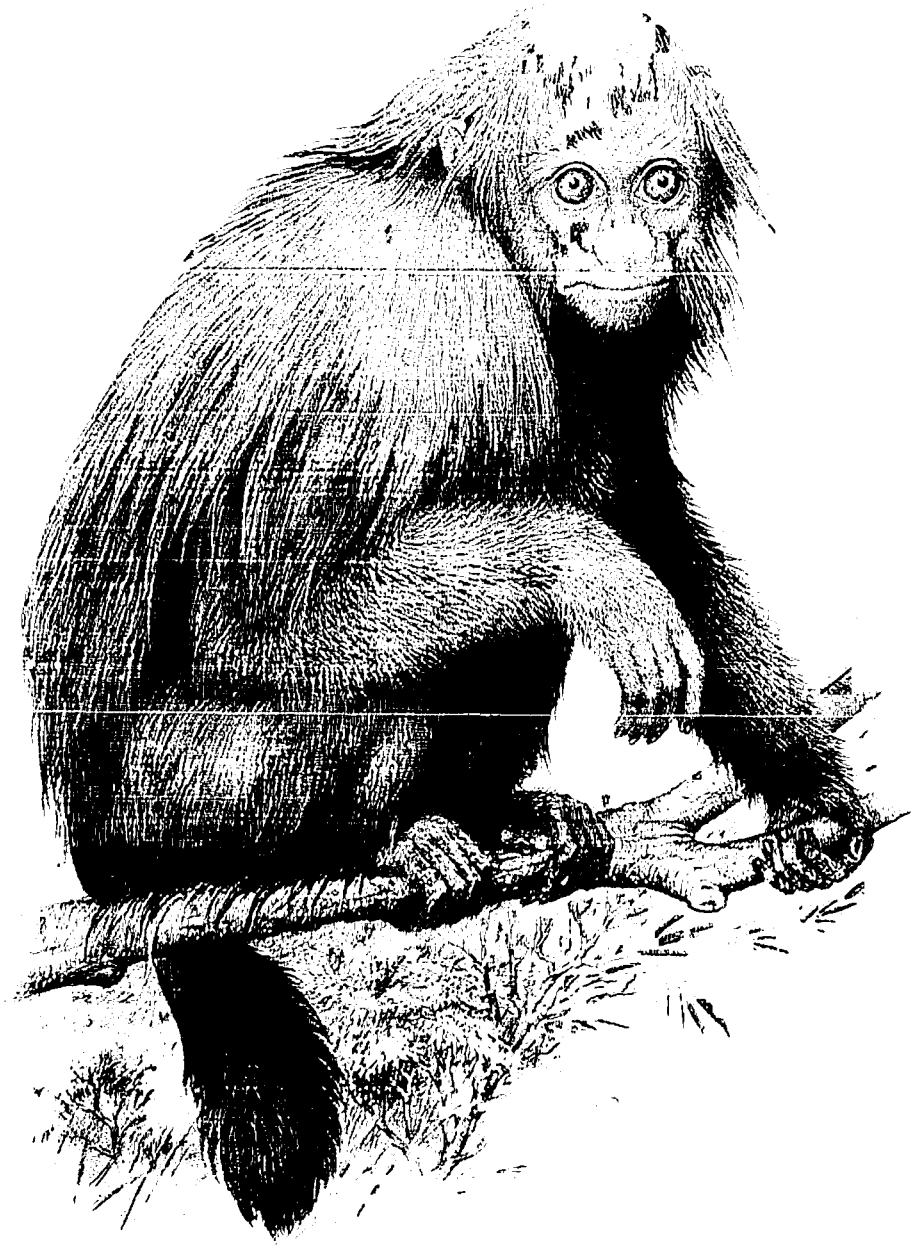
Nigeria's only IUCN mainstream area is the Yankari Game Reserve (P-type); but another game reserve and six lesser reserves are under development. Chad has two fine P-type national parks at Zakouma (with elephant and black rhino) and Manda (elephant); and is developing four nature reserves.

Cameroun has three P-type national parks at Boubandjidah (black rhino), Benoue (black rhino) and Waza (fine birds) and is developing a dozen nature reserves. Sudan has three national parks, six mainstream game reserves and nine more game reserves under development. Most of the national parks and main game reserves have a P-type fauna, with the endangered white rhino at Southern and Nimule National Parks and Shambe and Juba Game Reserves, and black rhino at Mongalla and Badigeru Nature Reserves.

In Ethiopia the National Park of Menagasha was formed in 1958 by proclamation of H.I.M. The Emperor of Ethiopia. So far, it is the only conservation area in Ethiopia that has reached mainstream status in IUCN's books. This is not for want of trying, for the Imperial Ethiopian Government since 1963 has received a number of missions from UNESCO – starting with that lively conservationist Sir Julian Huxley – and from WWF. Ethiopia's main difficulty is in the deployment of conservation measures in a country where farming erosion, overgrazing and hunting overkill are rife. Yet several Red Data Book animals are indigenous to this country and no other, and are in real danger, notably the Tora and Swayne's races of hartebeest, the Walia ibex and Prince Ruspoli's



Facing
The Galápagos flightless cormorant breeds on but two of the Galapagos Islands in the equatorial Pacific 600 miles west of Ecuador and has a population of under 1,000



The red uakari is confined to the forests of the Brazil-Peru border and under severe over-hunting pressure.

turaco. The senior author of this book was among those on a recent visit which could be classed as a WWF mission.

It is hoped that the relict P-type faunas will be protected by a strengthening of the Wild Life Conservation Department and the development of a great new system of national parks and game reserves to IUCN standards, notably the Semien Mountains *National Park (Walia ibex's sole habitat)*, the Metahara or Awash National Park, the Maji or Omo National Park, a new national park in the Bale and Arussi Mountains (mountain nyala), and game reserves in the Danakil area (Somali wild ass), the Lake Rudolf region (Swayne's hartebeest), the Rift Valley Lakes (waterfowl) and at least five other areas.

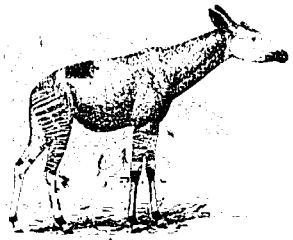
The personal interest of H.I.M. The Emperor in conservation makes us confident that Ethiopia, home of so much of the classic African P-type fauna, will become a model conservation country to the world in general, and forward-looking Africa in particular.

In French Somaliland two national parks were designated before the war and two reserves have been also designated, but in the absence of information about their management, IUCN has not put them on its mainstream list. In Somalia one complete reserve at Bubasci *is* mainstream (with black rhinoceros, Hunter's hartebeest and beira); a national park and six more reserves are under plan.

Kenya has a fine conservation record with five mainstream *national parks and seven mainstream reserves*; and three more national parks and two more reserves under development. Red Data Book animals protected include the black rhino (at Tsavo, Aberdare, Mount Kenya, and Nairobi National Parks, and at Masai Mara, Meru, Isiolo Buffalo Spring, and the Samburu Uaso Nyiro Reserves), and all the mainstream areas are P-type. The wardening service is big, well trained and skilful; four of the mainstream game reserves are managed by county councils, the rest by the Trustees of the National Parks of Kenya and by the Forest Department.

All Uganda's conservation areas are P-type; in IUCN's main stream list are three national parks and four game reserves; also developing are two white rhino sanctuaries and a mountain gorilla sanctuary which adjoins that in Rwanda (another gorilla reserve is developing), and forty other reserves. The parks are managed by the Trustees of the National Parks of Uganda and the game reserves by the Ministry of Animal Industry. Like Kenya, Uganda is inspired by a forward-looking and scientific view of conservation. The white rhinoceros is an endangered animal which has been introduced at the Murchison Falls National Park and is also conserved at the Lumunga Game Reserve and the two special white rhino sanctuaries of Mount Kei and Mount Otze. The black rhino is present at Murchison Falls.

Tanzania can be safely assigned, with Kenya and Uganda, to the Big Three conservation countries of East Africa. All its five mainstream national parks and three reserves are P-type, as are most of its eight other developing reserves in Tanganyika; in Zanzibar there are three developing forest reserves on the main island and two on Pemba. A Red Data Book animal, the black rhino, is preserved in Serengeti, Ruaha, Lake Manyara, Ngurdoto Crater/



Not discovered until early in the present century, the okapi of the Congo forests is the only other living member of the giraffe family besides the giraffe. It is not thought to be in present survival danger but its status is being carefully watched

Momella Lakes National Parks, and in the Ngorongoro and Tarangire Reserves. The Serengeti-Ngorongoro complex provides one of the largest P-type spectacles in the whole of Africa. Appropriately, it lies not far from Olduvai Gorge, where Louis Leakey and his family have made their classic discoveries of ancient African men and ape-men.

Rwanda has two fine national parks, with a P-type fauna. At Kagera black rhinos, introduced from Tanzania, first bred in 1961. At Albert, despite ecological damage in the revolution of 1959, a mountain gorilla population survives. Burundi has no mainstream area, but is developing a game reserve on Lake Rwihinda and, with FAO and IUCN advice, is planning a fully protected reserve on the Ruizizi Plain near Kihanga. Congo (Kinshasa) has three great national parks – Upemba, Albert and Garamba – and is developing a nature reserve at Mount Kahuzi. All have a P-type fauna. At the volcanic Albert Park, which extends over the Rwanda border with the same name, the fauna includes mountain gorilla and okapi and is a classic African rain-forest community. Garamba has a white rhinoceros population. Congo (Brazza) has the P-type Odzala National Park (with lowland gorilla) and three developing reserves.

Gabon has a national park at Okanda and a nature reserve at Ofoué, with a typical forest fauna. Another reserve has been projected. In Angola mainstream areas with P-type fauna are the national parks of Quiçama and Iona and the nature reserves of Cangandala and Luando. Under development are another national park and a reserve system in four areas. Black rhinos are present in Iona and the Red Data Book giant sable antelope in Luando and Cangandala.

All Zambia's mainstream areas, the Kafue National Park and seven game reserves, are of P-type fauna; and three more game reserves are under development. Black rhinos are found at Kafue and at the game reserve of Mweru. In Malawi the Malawi National Park is a mainstream conservation P-type fauna area; but five developing game reserves were under too much human pressure from poaching, and, in one case, cultivation, to reach the IUCN main list. In Mozambique the Gorongoza National Park, likewise, is a mainstream conservation P-type fauna area with black rhinos; under development are reserve systems in four areas.

Conservation has reached a sophisticated level throughout southern Africa. In Rhodesia three national parks are not on IUCN's list because of their small size, and numerous nature reserves are "controlled hunting areas" or private, and do not yet rate inclusion; nor do four official reserves. But the mainstream list embraces no less than ten national parks and six game reserves. These all have P-type faunas. Protected Red Data Book animals are the black rhino in Wankie and Rhodes Matopos National Parks, and in Cheware, Matusadona, Chizarira and Mana Pools Game Reserves; and the white rhino in Rhodes Matopos and Kyle Dam Game Reserves; it has been safely translocated to the latter from South Africa.

In Botswana the area adjoining South Africa's Kalahari Gemsbok National Park became an official game reserve in 1965

having been one in effect since 1944. This has mainstream status as a valuable extension of Gemsbok, with similar P-type fauna. Five other sanctuaries or reserves are under development. In Southwest Africa the P-type fauna Etosha Game Park is mainstream, with its mountain zebras and black rhinos; and six other game reserves are still developing.

In the Republic of South Africa is the greatest deployment of conservation areas in the continent. Six national parks are administered by the National Parks Board of Trustees under an Act of 1962. The greatest of all of them, Kruger, was created Sabie Game Reserve by President Kruger as early as 1898 and became the Kruger National Park in 1926. All the South African national parks have P-type fauna: the white rhinoceros lives at Kruger, and the black at Addo Elephant.

The protected mainstream land in Cape Province comprises three nature reserves and the de Hoop Wildlife Farm. The bontebok, which is also present in Bontebok National Park, lives also in the Cape of Good Hope Nature Reserve.

In Natal one of the fourteen mainstream reserves is the Royal Natal National Park, and another the St Lucia Park; the rest are designated nature reserves. All have been most efficiently managed by the Natal Parks, Game and Fish Preservation Board since it was set up in 1950. All have P-type faunas. The black rhinoceros lives in Umfolozi, Mkuzi and Hluhluwe, and the white rhinoceros has done so well at Umfolozi and Hluhluwe that many have been translocated to other reserves, parks and park zoos.

In the Orange Free State the mainstream Willem Pretorius Game Reserve houses a typical P-type local fauna.

The five mainstream reserves of the Transvaal house both African rhino species at Loskop Dam, whence the white rhinoceros has been translocated. All have a P-type fauna, including Barberspan Nature Reserve whose Pleistocene-type animals are birds, notably the two species of African flamingos and other lovely wetland birds like spoonbills and herons.

Two new South African national parks are on their way; and under development also are a dozen more nature reserves in Natal and seven in the Transvaal. Municipal reserves are now deployed in Cape Province (ten), Orange Free State (two) and the Transvaal (nine). There are also five reserves in Cape Province under divisional councils; many private reserves; sixty-seven forest nature reserves under the Department of Forestry, and on the coast five rock lobster reserves and thirty-three state guano islands where the seals and seabirds are totally protected. In Lesotho there is no reserve; in Swaziland there is the Milwane Game Sanctuary, a P-type mainstream conservation area with white rhinos.

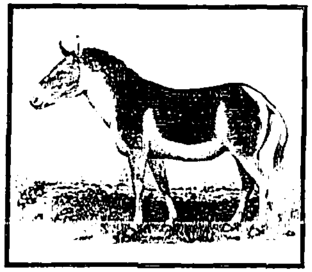
The South African conservation network is an exemplary model of the deployment of nature care thoughtfully, and not cheaply, on the continent that has the best surviving Pleistocene fauna. South African brains, hard-won knowledge, and hard work have done wonders of which they are proud, and of which the world is proud. They are the real experts on the African heald.

The Indian Ocean islands, which support the Madagascan subfauna, are crowded with conservation problems. Madagascar,

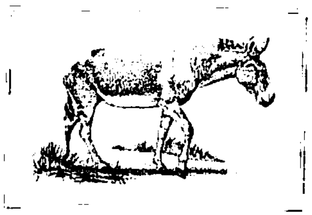
race, *E.h. onager* (the onager), formerly ranged over the south Russian steppes, northwest Afghanistan and north Persia. It is now extinct in Afghanistan and much reduced in Russia where, confined to the 290 square-mile Badkhyz Reserve, established specially for it in 1941, it has stabilized at *c.* 700 population after some vicissitudes. In Persia small isolated populations may survive near Gum and Meshed and number a few hundred. H p. 241. Indian race, *E.h. khur* (the khur), formerly ranged widely over the dry plains of northwest India and West Pakistan, but is now reduced to under 1,000 animals, mostly in the Little Rann of Kutch, a few in southern Sind. Tibetan race, *E.h. kiang* (the kiang), formerly ranged over the Tibetan Plateau north to the Koko Nor and south to Ladakh, Nepal and Sikkim, and probably keeps the same range, perhaps with a reduced and scattered, but not presently with an endangered population. A. Syrian race, *E.h. hemippus*, was last seen in 1927 in the Jabal Sinjar, north of the Euphrates, and is doubtless extinct; it formerly ranged through Syria, Palestine, Arabia and Iraq.

African wild ass, *Equus asinus*, [illegible] races [illegible] 1000. Nubian race, *E.a. africanus* [illegible] Su[illegible] into Eritrea [illegible] survive (and this needs confirmation) in the Sudan-Eritrea border region. Population [illegible] in 1[illegible] Chad and in [illegible] Guera [illegible] to Libya may [illegible] west of the Nile [illegible] groups of gone-wild feral asses [illegible] the domestic donkey [illegible] B. Somali race, *E.a. somaliensis*, formerly extended from Eritrea south of Massawa through much of Ethiopia to Somalia. The main population in Ethiopia [illegible] 200 [illegible] animals in the [illegible] area. Other herds may have survived at Lake Hertale in Ethiopia, Buri in Eritrea and in Wadi Nogal in [illegible] Somalia. There [illegible] tion. C

Mountain zebra, *Equus zebra*, 2 races. Cape race, *E.z. zebra*, the first zebra known to Europeans, was, at its discovery, confined to the montane area of Cape Province, and had some measure of protection as early as 1656. But after farming and human development pressures it was down to *c.* 47 animals in 1950. Largely due to the development of the *Mountain Zebra National Park* the population of the race had been brought up to 75 strictly protected individuals by 1965. D. Hartmann's race, *E.z. hartmannae*, ranged from southern Angola through southwest Africa to the Orange River on the western edge of the Namib Desert. The population has declined from a large one to *c.* 7,000 in 1967, partly due to a



A Kiang or Tibetan race of Asiatic wild ass



B Nubian race of African wild ass

C Somali race of African wild ass

D Cape race of mountain zebra

programme of game-proof fencing which has restricted access to grazing and water. The race is protected from hunting but needs ecological management.

Quagga, *Equus quagga*. Formerly Cape Colony; the last certain one died in the Amsterdam Zoo in 1883 August 12.

Family TAPIRIDAE, tapirs

Mountain tapir, *Tapirus pinchaque*. Rare and substantially declining in the temperate forests and grasslands of Andean Colombia, Ecuador, northern Peru and possibly western Venezuela.

Central American tapir, *Tapirus bairdi*. Formerly ranged from southern Mexico to Colombia and Ecuador west of the Andes; is now greatly fragmented in [illegible] only in the few remaining undisturbed substantial forest stands; it is becoming very rare indeed in Mexico.

Family RHINOCEROTIDAE, rhinoceroses

Great Indian rhinoceros, *Rhinoceros unicornis*. Formerly ranged over most of the northern Indian subcontinent, including Nepal, from Peshawar in West Pakistan and Kashmir east to the Burma border and south through the Ganges Plain. Retreated with human land development and under some hunting pressure to a relict type distribution over 50 years ago, and has now declined to a population of *c.* 740 in the 1960s, of which about 165 were in the Chitawan Sanctuary in the Rapti Valley of Nepal and the rest in India, where no less than 400 were estimated in the 166-square-mile Kaziranga Sanctuary in Assam, the rest in Assam (most in 7 sanctuaries) and West Bengal (2 sanctuaries). Strict protection devised by the Governments of India and Nepal has stabilized the population.

[illegible] rhinoceros, *R*[illegible] In [illegible] times extended in Asia to India and Ceylon, and but 100 years ago was still in northeast India and southwest China; in the early decades of the present century it survived in Thailand, Laos and Vietnam. It lasted in Sumatra until the early 1940s, but since then has been confined to Java where it now survives only in the Udjong Kulon Reserve in the extreme west. In its 117 square miles there were not more than 40 Javan rhinos in 1967. Here under management aided by the WWF, the Fauna [illegible] IUCN and [illegible] making a [illegible] stand.

Sumatran rhinoceros, *Dicerorhinus sumatrensis*, 2 races. Was once distributed from East Pakistan through Assam, Burma, much of Thailand, Cambodia, Laos, Vietnam, and Malaya to Sumatra and Borneo. Small relict populations of the mainland race, *D.s. lasiotis*, still survive in Burma (*c.* 20–30), Thailand (*c.* 6), Malaya (*c.* 30) and Cambodia (*c.* 10), and perhaps in Assam, East Pakistan, Laos

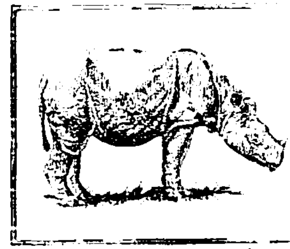
and Vietnam. The Sumatran race, *D.s. sumatrensis*, survives in Borneo (*c.* 10–30) [illegible] Sumatra (*c.* [illegible]) where its headquarters are in the swamp regions of Riau (*c.* 35), and it is also present in the Loser (north, *c.* 20) and South Sumatran ([illegible]) nature reserves. The future of the species depends as much on ecological research as on international sanctuary management and conservation law enforcement. E

Square-lipped or white rhinoceros, *Ceratotherium simum*, 2 races. F

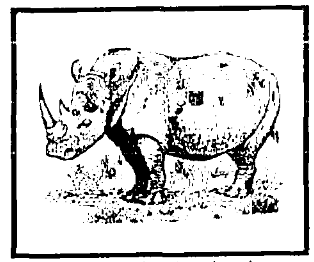
[illegible] Zululand [illegible] [illegible] the [illegible] Parks Board and Game Preservation Board of Natal has [illegible] Reserves the Hluhluwe population was [illegible] to other national parks in South Africa, Rhodesia, and even Kenya and [illegible]

Northern race, *C.s. cottoni*, was in the 19th century widely distributed in northeast tropical Africa west to Chad and north to the Nile in the Sudan; it now has populations in the Sudan (Bhar el Ghazal and Equatoria, where estimates vary from a few hundred to 2,000); in parts of the west Nile Province of Uganda (*c.* 350 1955, under 80 1962), in northeast Congo (Garamba National Park *c.* 1,000 1963, of which invading rebels from the Sudan may have destroyed at least 900 as under 100 were reported surviving in 1966); and in northern Ubangui in the Central Africa Republic (Ndende and Birao, present but under 10 reported 1965). By translocation, a small breeding group has been established since 1961 in Uganda's Murchison Falls National Park; and it is on safely managed national parks that the future of this seriously declining race depends.

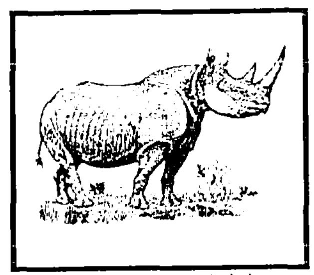
Black rhinoceros, *Diceros bicornis*. Formerly inhabited virtually the whole of Africa outside the rain-forest belt from Cameroun, Chad, southwest Ethiopia and Somalia south to Angola and the Cape Province of South Africa. IUCN's Survival Service Commission census undertaken in 1960 lists the surviving wild populations thus:
Cameroun 400, Congo (Kinshasa) a few (in Kagera and Upemba national parks),



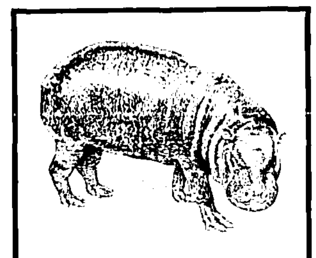
E Sumatran rhinoceros



F Square-lipped or white rhinoceros



G Black rhinoceros



H Pygmy hippopotamus

Chad 600, Zambia 400, Central African Republic 300, Rhodesia 1,500, Sudan 200–300, Mozambique 500, Ethiopia a few, Angola 150–200, Somalia almost extinct, South-West Africa 280, Kenya 2,500, Botswana 20, Uganda 500, Malawi 12?, Tanzania 3,000–4,000, Republic of South Africa 508.
The total (11,000–13,500) indicates that the black rhino has the highest population of the living species; but these figures represent a strong decline as a consequence of bush clearing and hunting, even in Kenya. There is still much illegal hunting of rhinos for the trade in their horn, to which folklore attributes aphrodisiac properties. International plans of the national park authorities of Africa look forward to a wide restocking with the use of translocation where possible. G

Order ARTIODACTYLA
Family SUIDAE, Old World pigs

Pygmy hog, *Sus salvanius*. Formerly restricted to the Terai swamp-grasslands of Nepal, Sikkim, Bhutan and northwest Assam, the animal has not been recorded since 19[illegible] [illegible] Nepal [illegible] been further explored it cannot [illegible] be held extinct.

Family HIPPOPOTAMIDAE, hippopotamuses

Pygmy hippopotamus, *Choeropsis liberiensis*. Has a discontinuous distribution in West Africa which appears relict. In Nigeria it is confined to the Rivers and Owerri Provinces; in the Ivory Coast it has not been recorded further east than the River Bandama; in Liberia it is generally distributed in the river systems, in Sierra Leone it is local but fairly widely distributed in the east; in Guinea it lives in the extreme southeast, and in Portuguese Guinea a small population was recorded in 1958 near the River Corubal. In the present century declines have been recorded at least in Liberia and Nigeria. The wild surviving population needs extensive survey. The species breeds well in captivity, especially at the Basle Zoo in Switzerland. H

Family CAMELIDAE, llamas and camels

Vicuña, *Vicugna vicugna*. Has a now relict distribution in the puna, or 12,000–16,000 foot Andean plateau of southern Peru, eastern Bolivia, northwestern Argentina and northern Chile. Has declined under hunting pressure in last 3 decades and is still killed for meat and wool despite legal protection in all 4 countries.

Bactrian camel, *Camelus bactrianus*, 2 races. The typical race, *C.b. bactrianus*, is the domestic form. Wild race, *C.b. ferus*, was already a relict in historical