

THE ZOO CULTURIST



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Tropical forests cover 8 percent of the world's surface in a belt around the equatorial region. Not all tropical forests are rainforests. The deciduous tropical forest receives about 60 inches of rain per year, with a dry period of four to six months when trees are leafless. The moist tropical forest receives at least 120 inches of rain per year, but may have a period of three months or less with only a little rain. The true rainforest, also called an evergreen forest, receives 150 to 400 inches of rain throughout the year and has dense vegetation forming a closed canopy. It is the rainforest that is the most complex, with a larger variety of plants and animals than any other ecosystem on Earth.

What are the world's tropical forests worth to you?

Tropical forests are home to at least half, and some say many more, of all plant and animal species on Earth. A large majority of these species are still undiscovered. Though scientists have identified one and a half million species to date, half of them insects, estimates for the total number of species on Earth range from five million to over 50 million; the World Wildlife Fund estimate falls about halfway between these extremes at 30 million.

You may realize from these figures that man has no clear idea of how many species exist. What scientists do agree on, however, is

that we have only just begun the task of identifying the species that share our world. The vast wealth and diversity of life on Earth is an unexplored frontier, and much of that frontier is tropical forest. If one accepts the figure of 30 million species on Earth, and if tropical forests harbor at least half of Earth's species, then 15 million different kinds of plants and animals are a part of the tropical forest.

The richest ecosystem on Earth, the tropical forest is extremely intricate and diverse. Seven hundred species of trees grow in all of North America. The tropical island of Madagascar alone boasts 2,000 tree species. Tropical forest trees are hosts to thousands of other plants, themselves hosts to animals such as insects, frogs, and snakes. A single square mile of Andean rainforest affords food and shelter to at least 80 species of frogs, almost as many as in all of North America. Nearly 800 species of reptiles and amphibians are known to occur in Ecuador, over one third discovered only since 1970. In the tree canopy of just two acres of Peruvian rainforest, scientists catalogued 41,000 different insect species, including 12,000 types of beetles. A single tree sheltered 43 ant species, the number of species of ants found in all of Canada.

This incredible variety of life is threatened by the growing pace of tropical forest destruction, which

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E D I T O R

"Muchos Gracias"

Ask and Ye shall receive — or, as my approach has been over the years — all they can say is "no."

We asked and did we receive! For the first time ever we have several more articles than this issue can cover — and what a feeling it is. To all of you that sent articles: "muchos gracias" from us.

On top of this good news, you also responded generously to the request for photos for the library, and I am sure they will be of use as time goes on.

*However, the ultimate goal still is to have enough materials on hand for at least two future issues at a time — so please, keep us inundated with **your** stories.*

*By the end of this second year of publication, I would like to see this journal grow to at least 24 pages per issue — and you, the members, **can** make it happen.*

One of the Board members offered a suggestion that sounded like something worthwhile pursuing, and I would like for you to try it on for size. It's not the newest approach, but it has worked well for those that have done it before.

Many of us often get the opportunity to visit with people in our line of interest that are out of the regular paths of travel. Why not take the extra time to chat with them at length and get some nice

photos of their facility — and submit it for publication?

Worth the effort? Here is your chance to let us know.

Ingrid U. Schmidt

Helpful Information for the Future Author

A number of articles have come in with the remark "if you feel it's good enough."

All of us have a story to tell and I **do not** judge whether it's good enough — only if it's relevant.

Do remember:

- that we may exercise some editorial control, although to date we have always contacted the author prior to publication

- available space and contents will be used as guidelines at the time of final typesetting

- articles should relate to the overall subject of zooculture, without having to be intensely scientific, and

- good quality photographs would be of help, a-a-a-and of course, if you are artistically inclined, send your artwork along.

Mail your articles to Ingrid U. Schmidt, *The Zooculturist* Editor, 2721 Della SW, Albuquerque, New Mexico 87105 USA.

ATTENTION! Polish Connection

Because of a recent inquiry that had been sparked by the arrival of a surplus list from Malaysia with some "hard-to-find" species on it, I received some eye-opening facts about the firm that was advertising these animals.

The International Primate Protection League (IPPL) had sent out a smuggling alert on January 17, 1989, detailing the entire affair. After reading the two page alert and some other supporting materials, I felt that all of us involved with zooculture should know about this — and I obtained permission from their Chairwoman to use the material.

Unfortunately, because of all the other materials received for this issue, we will not be able to publish the alert in its entire length, but we will include the most pertinent excerpts and provide you with the address to obtain the entire document and the supportive information.

The alert was sent out in the hope that responsible institutions and individuals would refrain from accepting any wildlife from Poland unless it had 100% authentic proof of captive birth. Copies of documents show how Polish zoos are operating a "scam" by which they obtain shipments of animals from these dealers, retain a few of them, and hold the rest of them for onward shipments to other countries — with fraudulent documents claiming the animals to be "captive born."

Among the animals offered under this "scam" are wild-caught Asian elephants, wild-caught Slow lorises and wild-caught Douc langurs, a highly endangered species. All are protected by law in their country of origin. Tapirs and rare gibbons have also been shipped out through this "scam" and the fear is that other rare species will follow. Since Poland is not a member of CITES, everyone should be cautious about accepting reports or documentation of "captive bred" when considering animals from that country.

For further information, please contact

Shirley McGreal
Chairwoman, IPPL
P.O. Drawer 766
Summerville, SC 29484 USA

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 Editor **INGRID U. SCHMIDT**
 Associate Editor **BILL BUCHANAN**
 Editorial Committee **NANCY CHERRY, ANDREA Tinker' OUST**
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5555 Zoo Boulevard Wichita, Kansas 67212 USA

Our Vanishing World

(continued from front page)

World Wildlife Fund now calculates to be about 59 acres per minute, or 31 million acres per year. If this pace continues unabated, the world's tropical forests will be gone within 40 years, and with them will go many of Earth's plants and animal species.

Since World War II, over half of the world's tropical forests have been destroyed; every year the rate of destruction increases. Primary rainforests of India, Bangladesh, Sri Lanka, and Haiti are already gone. The forests of Malaysia, Indonesia, the Philippines, New Guinea, Nigeria, and the Ivory Coast will be gone in the next decade, and many other countries will have lost one third to one half of their remaining forests. By the year 2000, 23 of the 33 main timber-exporting countries are expected to have lost their capacity to supply trees; they may become timber importers themselves.

With the advent of power tools and heavy machinery, the clearing of forests has become much easier



Art courtesy of David Bleakly

billions per year in world trade, is one of the few sources of foreign currency many of them have. So far, the timber industry has shown little concern for the damage it is causing. No sustainable timber concessions are at work anywhere in the world today. Reforestation does not exist on a large scale: world-wide, only one tree is planted for every ten felled. Even where forests are not clear-cut, but logged selectively, damage to the remaining forest can reach 65 percent.

American restaurants. By far the most destructive force, however, is the pressure of people who must provide food and fuel for the survival of their families.

The population in tropical countries is growing at a rate of 80 million people per year, most of them so poor that they must use the forest to survive. A family clears land by slash and burn, a few acres at a time, cultivating the cleared areas. After two or three years, crops fail on cleared tropical forest land. Though it may appear that the soil must be rich to support luxuriant tropical forest growth, in fact it is not. Tropical forest soil actually is very poor in nutrients, all at work in the growing forest and recycled above ground. Decomposition of fallen vegetation occurs rapidly, within a few weeks compared to the months of decay in a temperate forest. Nutrients do not have a chance to cycle through the soil; they are returned directly to the living plants. The farmer trying to grow food in this nutrient-poor soil must move on and clear more land, slashing and burning every few years in a continuous cycle.

The never-ending search for fuel adds to forest destruction. In developing tropical countries where wood is the only fuel available to the poor, eight times more wood is

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The population in tropical countries is growing at a rate of 80 million people/year, most of them so poor that they must use the forest to survive.

and quicker: a tree that took half a day to fell with a hand saw can now be felled in half an hour with a power saw. We lose twelve and a half million acres of tropical forest to the logging industry each year. As the demand for timber continues to grow, prices rise for the disappearing, slow-growing hardwoods. Developing countries need money *now* to pay their debts and support their economies; the timber of their forests, worth \$8

Logging is a direct cause of tropical forest destruction. When miners, settlers, farmers, and ranchers use logging roads and move into the forests for their own purposes, the harmful effects of logging multiply. In what is sometimes called the "hamburger connection" to tropical forest destruction since 1950, two-thirds of Central America's forests have been cleared to provide pasture for cattle destined to become hamburgers in North

The Woolly Rhino

by Bill Johnston

On the far-off island of Sumatra, a strange, prehistoric beast moves slowly through the jungle. The animal grazes peacefully, unaware that nearby a horde of sweating men are busy hacking away with chainsaws and axes, cutting down the huge old trees.

Man's insatiable demand for timber devours the remaining jungles relentlessly. This scene is repeated in jungles all over the world. Soon, the age-old habitats of our wildlife will only be a memory.

Here in Sumatra, it is doubly tragic, for this is the domain of the Sumatran rhinoceros (*Didermoceros sumatrensis*), long called the "woolly rhino" because of its hairy coat. Once these rhinos roamed over the greater part of southeast Asia, but now are limited to the more remote areas of Malaysia and Indonesia. There are estimated to be only 500 to 750 in existence in the wild state today. With their forest homes vanishing at ever-increasing rates, their future is in serious peril.

The Sumatran rhino is the smallest of the five living species, standing around 135 cm at the shoulder and averaging in weight about 1500 kilos. They live in the denser parts of jungles and swamps, foraging with their prehensile lip for their diet of leaves, twigs, fruits and bamboo shoots.

Hair is pronounced around the ears, back, and between the legs. The front horn is the largest while

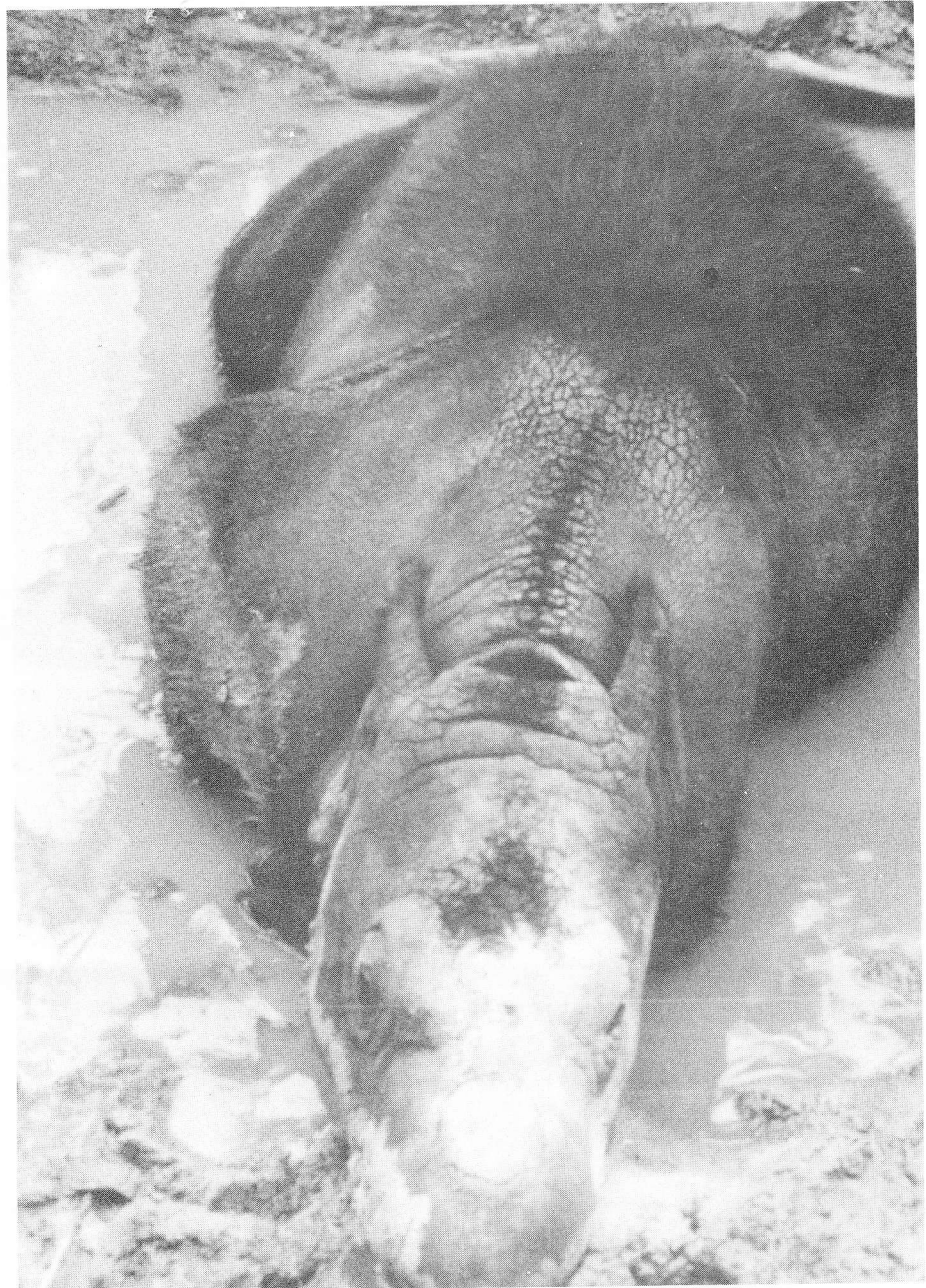


Photo courtesy of Port Lympne Zoo Park

Torgamba, a male Sumatran rhino, was captured in 1985 and transferred to England via land, sea and air.

the rear one is only a small protuberance. They have poor sight but excellent hearing and smell. As all rhinos do, they frequent mud wallows to protect their hide from inflammation and to keep free of parasites.

They are nocturnal and solitary animals. Unfortunately, propagation is slow with this species, with a single calf being born every three to four years. (Gestation is thought to be between 9 and 14 months, and the calf remains with the mother for one to two years.)

The first discovery of the Sumatran rhino was by William Bell, a

surgeon with the East India Company in 1793. Many years passed before the first Sumatran rhino came into captive hands. This occurred in January 1869, in the Assam province of India. A female, called Begum, was held at the village of Chittagong for four years, adjusting to captivity. She was acquired by an English animal dealer, Jamrach, who sold her to the London Zoo. She began her lengthy stay there on February 15, 1872 and managed to establish a longevity record, expiring at the zoo on August 31, 1900.

Following Begum, a few more

Sumatrans found their way into captivity. The London Zoo recorded the most, with eight specimens during the years 1872-1900. Some Sumatrans even reached the United States. The Adam Forepaugh Circus had one around 1875. On a journey through New York, between Amsterdam and Schenectady, a bridge collapsed and the wagon containing the female rhino fell through. The poor beast's back was broken and she could not walk. She was left behind at Hoffman Ferry for treatment but died five days later. This same circus deposited a female Sumatran at the National Zoo in Washington, D.C., in November of 1893. She was returned to the circus in 1896, but there the trail ends.

Mary, another female Sumatran, arrived at the New York Zoological Park on December 16, 1902. This zoo was then in its infancy and cage space was limited — so Mary was sold to the Ringling Bros. Circus. She appears to have died in 1904. When a Sumatran female died of enteritis at the Schoenbrunn Zoo in Vienna, Austria in the summer of 1919, it was the last Sumatran to be seen in captivity until another 40 years had passed.

In 1959, a joint expedition was organized by the zoos in Copenhagen, Denmark and Bogor, Java. The expedition set up trapping operations in Sumatra. At this same time Peter Rhyniner, an animal collector, was commissioned by the zoo in Basel, Switzerland to collect a pair for them. Through the combined efforts of these collectors, a total of ten rhinos were captured, nine of them being females and only one animal a male. The male succeeded in escaping from his trap. Then six of the females were released back into the jungle. Of the remaining three females, one spent the next couple of years on the grounds of the Presidential Palace in Bogor before she died. The second, Bettina, was sent to the zoo in Basel, arriving on July 2, 1959. While at the zoo she was under constant medication for chronic nephritis and finally succumbed to this ailment on September 8, 1961. The

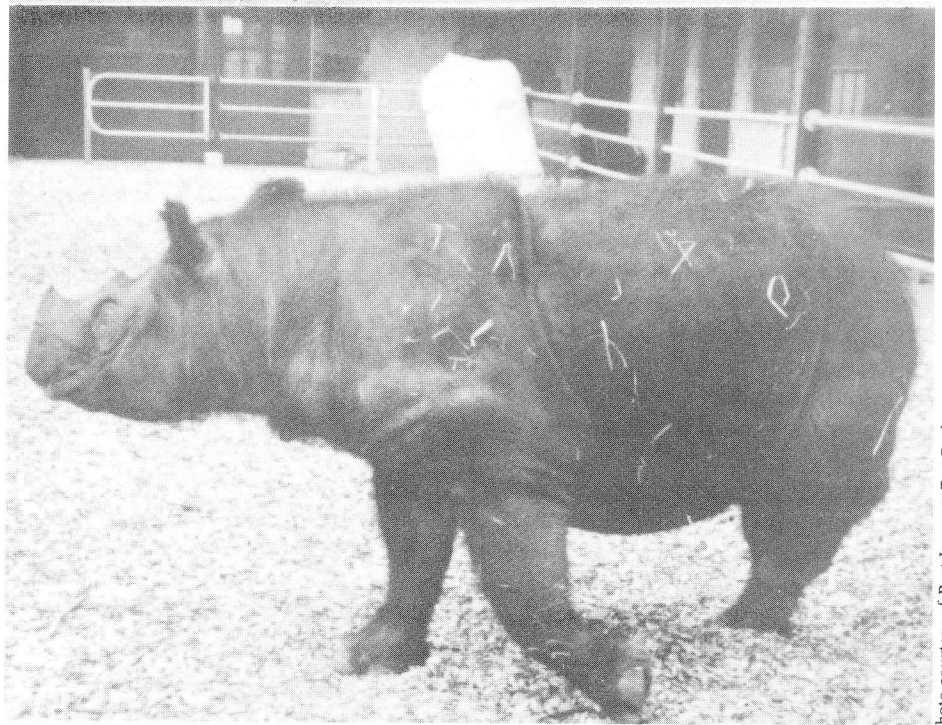


Photo courtesy of Port Lympne Zoo Park

The Sumatran rhino, smallest of the five living rhino species, stands around 135 cm at the shoulder.

last female, Subur, arrived on July 4, 1959 at the Copenhagen Zoo. She got on well in her new home, but all subsequent attempts to find her a mate failed, and Subur died at the zoo on February 24, 1972.

More years passed while the zoo world lacked a live specimen, but then in 1984 some farmers in Malaysia captured a female. Jeram, as she was named, was kept at the Melaka Zoo, operated by the Malaysian Department of Wildlife and National Parks. On May 24, 1985, in England, an historic agreement was signed — establishing a joint project between the Indonesian Forestry Department and Howletts and Port Lympne Foundation (HPLF), calling for the procurement of eight Sumatran rhino (four pairs). Two pairs were to remain in Sumatra, the others to be held at the Port Lympne Zoo Park in England.

A team of zoologists from that zoo and forestry officials from Indonesia set up headquarters in Sumatra. The first success was achieved in November of 1985 when a male was trapped in the Torgamba forest. Another male was caught two months later but died in the trap.

The first male, Torgamba, settled

down and was transferred to the headquarters camp. His diet was changed gradually to items that would be available at Port Lympne. From Sumatra to England is a long way, and therefore required careful planning for shipping. A road was built through the jungle to the port of Dumai, on the east coast of Sumatra. From there, a 31-hour sea voyage to Singapore, followed by a 17-hour flight on a Boeing 747, landed Torgamba in Manchester, England. The remaining distance to Port Lympne Zoo Park was made in a heated truck.

Tom Beggs, a veterinary surgeon at Port Lympne, accompanied Torgamba on the entire trip.

The animal adjusted to his new abode, accepting his diet of fruit and vegetables with no problems.

In January of 1986, the joint venture captured a female, but she died while still in her jungle forest corral from self-inflicted injuries. On June 22, 1986, another female was caught and after she was tamed down, she was shipped to Port Lympne, arriving on August 26, 1986. Named Subur, she was a difficult feeder at first. But after five weeks she seemed to change, eating well for a couple of weeks.

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Vanishing World

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collected and burned as fuel than is harvested for commercial use. The sheer volume of people using forests for food and fuel is the most serious threat to tropical forest survival. Because of the way nutrients are recycled, tropical forests are much more vulnerable to irreversible damage than temperate forests. It has been estimated that recovery of a tropical forest would take about 1000 years.

Indeed, all this is alarming. But you probably still wonder about the initial question: *What are the world's tropical forests worth to you?*

Think about the animals you see when you visit the zoo. Ninety percent of the world's primates are tropical forest dwellers, including many monkeys, great apes, orangutans and gorillas. Other tropical forest animals at the zoo include the jaguar, Asian elephant, Australian king parrot, Bali mynah and the emerald tree boa. Most of these are endangered, and loss of their habitat is the main reason.

Tropical forest animals are all around us, not only at the zoo. Many of "our" popular songbirds are migratory species which spend up to two-thirds of their lives in tropical countries. Of the 660 species of birds found in North America, nearly half winter in Latin

It is estimated that tropical forests contain two-thirds of the world's agricultural gene pool.

America and the Caribbean. Recent observations show that thrushes, vireos, warblers, and flycatchers are declining in numbers. Every year more and more birds arrive at their tropical wintering grounds to find cleared land that once was forest. Studies of wood thrushes show that the species probably won't survive if the bird's

migratory home in tropical forests is leveled.

Not only are the animals struggling to survive; so, too, are the native people of the forests. These people, an intrinsic part of the tropical forest ecosystem, understand the dynamics of the forest and know how to use it without destroying it. They, themselves, are a valuable resource.

Forest natives can recognize thousands of different plants and tell of uses for a large number of them. Chacobo Indians, when shown a two-and-a-half acre plot of rainforest randomly selected by researchers, identified 95 percent of the trees in that plot as medically

valued many wild plants that are richer in nutritional value than some of the domesticated plants we now use.

Like animals, plants do best if they possess hybrid vigor. In order to improve hardiness and resistance to pests and disease in food crops, farmers need wild plants as a gene pool of desirable traits for cross-breeding. It is estimated that tropical forests contain two-thirds of the world's agricultural gene pool. Because of their constant battle with plant-eating animals, tropical plants have evolved many forms of chemical defenses. Scientists know little about these natural pesticides.

Humanity has only begun to realize the potential of the tropical forest. This job would be much easier with the help of the native forest people who are disappearing along with their forests.

useful. The Indians of Amazonia use at least 1,300 plant species as medicines. Forty percent of the prescriptions written in the United States are for medicines derived from plants. Plants supply 76 major drug compounds, of which only seven can be commercially synthesized. Plant products treat such medical problems as malaria, amoebic dysentery, hypertension, schizophrenia, glaucoma, and heart problems. Alkaloids found in the rosy periwinkle of Madagascar's disappearing tropical forest are used to make medicines that treat Hodgkin's disease and leukemia. Since 1960, these medicines have increased the remission rate for Hodgkin's disease from 19 percent to 80 percent and, for childhood leukemia, from 20 percent to 99 percent. Worldwide sales of the alkaloids alone now exceed \$90 million per year.

Wild plants are the original source of the world's food crops. Although more than 80,000 plants are potential food sources, 90 percent of the world's food comes from only a dozen plants, half of these descended from tropical forest plants. Scientists have disco-

Tropical forest plants also produce industrial products worth billions of dollars annually. Natural rubber was originally found in the rainforests of the Amazon, as was the cocoa tree, the source of chocolate. Rattan, used to make furniture, is a fibrous, climbing forest plant from Asia. These products can all be harvested from the forest without destroying it.

Recently, naturalists have found that the copaiba tree of Amazonia produces a heavy oil that can be used in truck engines. Tropical forests provide spices, flavorings, edible oils, latexes, dyes, lubricants, water-proofing agents, waxes and pesticides. Forest products are used to make chewing gum, postage stamp glue, golf balls, nail polish, deodorant, toothpaste, shampoo and lipstick. All of this — a vast array of medicines, food and commercial products — and still humanity has only begun to realize the potential of the tropical forest. This job would be much easier with the help of the native forest people, who are now disappearing along with their forests.

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Woolly Rhino

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On the morning of October 29, 1986, she was discovered in great pain, and despite all treatment, she deteriorated during the day and died that same evening.

Fortunately, more Sumatrans have been captured and at present writing, 18 specimens are being maintained in captivity. The Melaka Zoo has eight females and one male. One is a baby female, Aminah, born May 23, 1986 out of Rima, a female discovered pregnant on capture. Captive births have, of course, been rare, with only three others recorded before Aminah's.

A Sumatran gave birth in Calcutta, India in February 1885. The mother and calf were sent to Hagenbeck's in Germany the same year. Another calf born at the Alipore Zoo in Calcutta on January 30, 1899. The third birth occurred on December 7, 1872 aboard the steamer Orchis, at Victoria docks in London. Mother and calf were unloaded and taken to their owner, a Mr. Rice, but this calf only lived two weeks.

The Ragunan Zoo in Jakarta, Indonesia has a male, Jalu. They recently traded another male, Napanga, to the Melaka Zoo for a female by the name of Dusun. This zoo has since received another pair. There is a single male being held in Sabah after two others died there from recent capture operations.

In July 1988, three females were caught by the joint operation. Two of these have come to the United States and arrived at the Los Angeles International Airport on November 25, 1988. One female will be held at the Los Angeles Zoo for the winter before going to its final destination, the Cincinnati Zoo. The other female is undergoing quarantine at the San Diego Zoo before being placed on exhibit. This female is 12 years old, tame and in excellent health.

All this is part of an agreement between the Indonesian Government and the American Association of Zoological Parks and

Aquariums (AAZPA) for the procurement of seven pairs of Sumatran rhino. Five pairs will go to major American zoos and two pairs will remain at the Jakarta Zoo.

But what of the wild state of the species?

Recent wildlife surveys give an estimate of 300-550 in Sumatra, roughly 100 in Malaysia and 40 in Sabah. In Sumatra, the most important concentrations are in the Gunung Leuser Park, Kerinci Seblat Park and the Barisan Selatan Reserve. The major locations in Malaysia are the Taman Negara National Park and the Endau-Rompin Park. In Sabah, there is the Tabin Wildlife Reserve, Silabukan and the Danum Valley.

Despite the game ordinances passed in 1931 prohibiting the hunting or possession of rhinos (and also the sale or export of rhino products), poaching still remains an important factor in their decline. Rhino horn is in constant demand in the East for varied medicinal purposes, guaranteeing to cure everything from swamp fever to impotence. In Malaysia in 1970, Sumatran rhino horns sold for \$1437 a kilo. In 1975, it was up to \$2165 a kilo — and in 1980 it reached an amazing \$12,500 a kilo. Is it any wonder that these rhinos are in danger of extinction?

The cooperative projects now existing between the governments of England, Indonesia, Malaysia and the United States offer us some promise for their future survival in captivity.

The situation in the wild state presents a different story. The battle there is yet to be won. Man's expansion into the Sumatran rhino's forest home will continue to take a toll. Poaching is a never-ending threat. But the battle must be won. To preserve the "woolly rhino" is a must. To allow this harmless beast to fade into extinction would be a terrible mark indeed on the world's conscience.

Bill Johnston has had more than 40 years experience keeping and training wild animals of all kinds with circuses, zoos and safari parks.

Dryland Plants

(continued from page 8)

Other hardy plants which are useful in creating a desert effect are shrubs: *Artemesia* (Sagebrush), *Fallugia paradoxa* (Apache plume), and *Chrysothamnus nauseosus* (Chamisa, Rabbitbrush) and wildflowers: *Penstemons* (Beardtongues), *Oenotheras* (Evening primroses), and *Zinnia grandiflora* (Desert zinnia). They are all showy, most being grown for their flowers, with the exception of the *Artemesias*, which are grown for their silvery foliage.

In designing a desert exhibit, there are several things to take into consideration as far as the plants are concerned. They all need full sun, good drainage, and slightly alkaline soil. Basically, areas west of the Mississippi River will meet these requirements, and little needs to be done in order to grow these plants.

East of the Mississippi, the soil will have to be amended to accommodate these plants. In order to provide the drainage they need, a sand bed seems to be the easiest solution. This basically involves placing several inches of sand over the ground and planting the desert plants directly into the sand. The addition of lime to the soil will help decrease the usually acid soils of the eastern states. (Do *not* add lime in the west.) Be sure to test the pH of your soil before adding any amendments.

Anyone who has been to the southwest has also noticed another striking feature of the landscape: rocks. Rocks should be used as specimens or in odd-numbered groups of 3, 5, 7, and so on in the desert garden. Be sure to bury them part way instead of just sitting them on top of the ground. Rocks in nature are much like icebergs — you only see part of them above the surface.

Even though cacti and native desert plants are often thorny, they may also be the only edible plantlife available in an exhibit. Many animals, such as jackrabbits and javelina, regularly eat prickly pears

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