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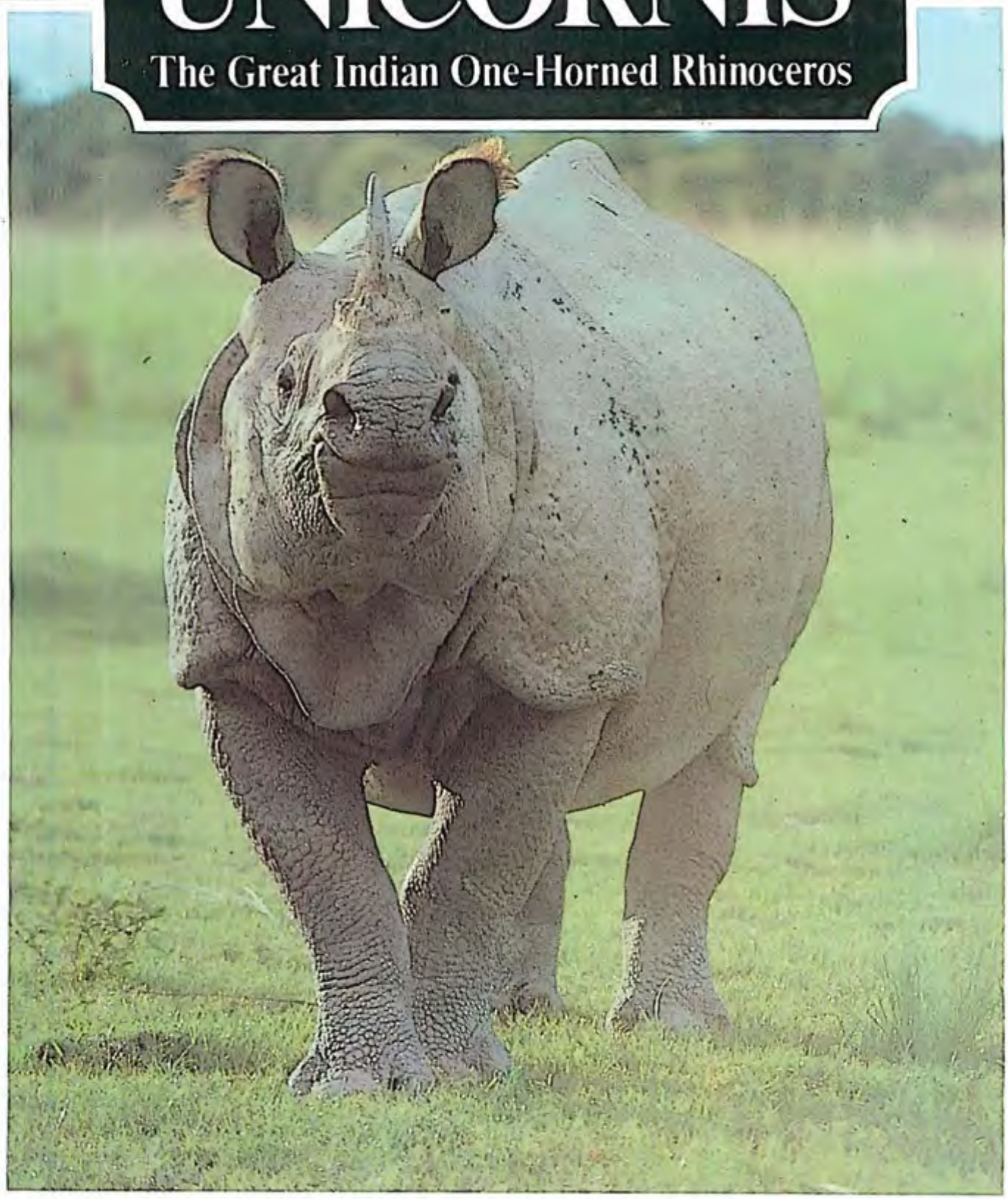
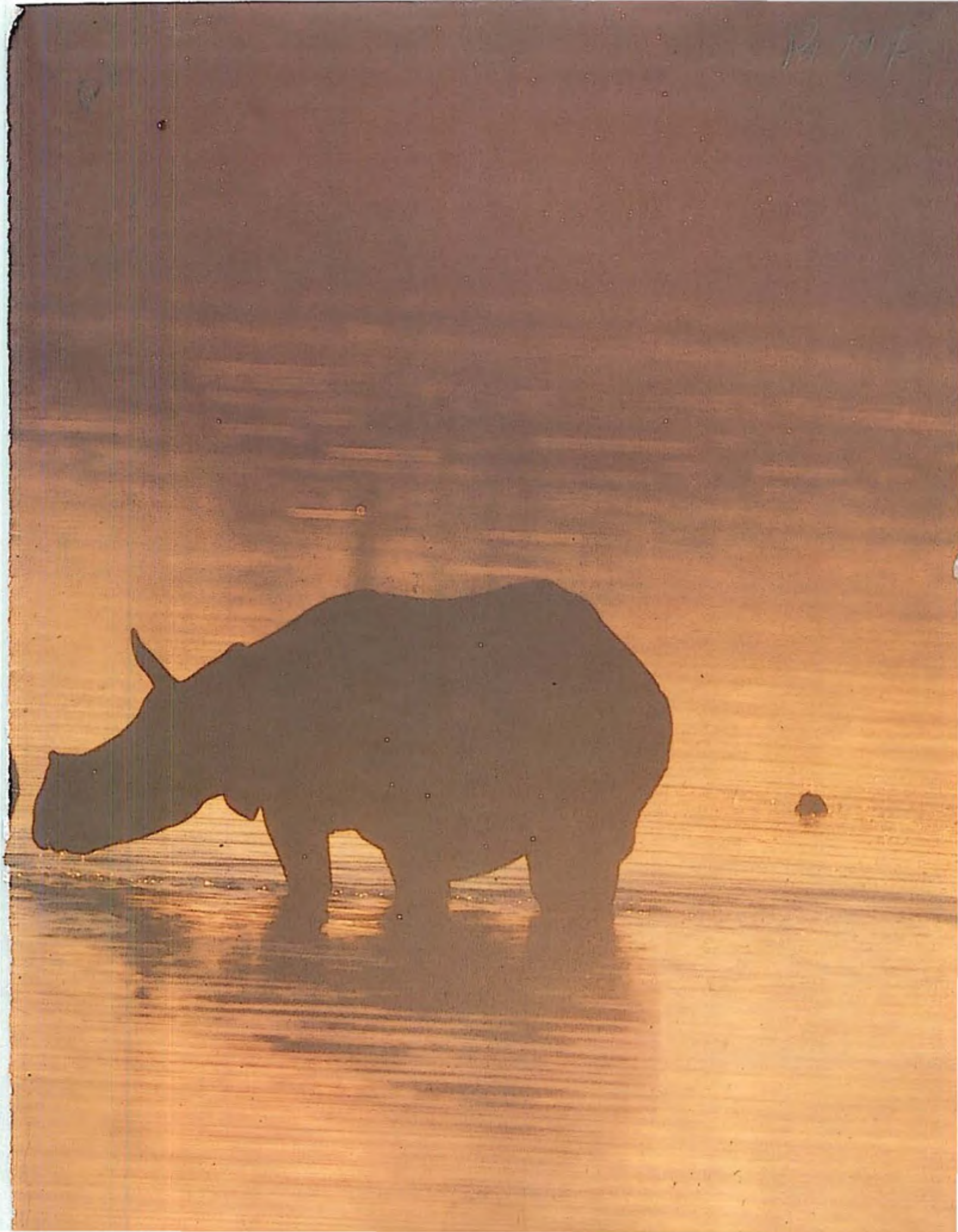
The Great Indian One-Horned Rhinoceros



Arup Kumar Dutta



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2. Mr. Durga Prasad Neog, Chief Conservator of Forests (General). An officer with vision and imagination, Mr. Neog has seen 32 years of active forest service, and has been responsible for quite a few measures for popularising evironment and wildlife conservation. His long stint in the field, especially as DFO in Kaziranga, has endowed him with deep knowledge of flora and fauna.

3. Mr. Sanjay Debroy. Till recently the Chief Conservator of Forests (Wildlife), Mr. Debroy has seen 32 years of forest service mainly in Kaziranga and Manas. From 1975 to '78 he was the Field Director of Project Tiger in Manas. His passionate devotion to the cause of protection of flora and fauna led to his being awarded the prestigious Norman Borlaug Award in 1988.

4. Mr. P. Lahan, Conservator of Forests (Wildlife). An authority on the Indian rhino, Mr. Lahan has seen over 24 years of forest service, 10 of them in Kaziranga. His depth of knowledge about the flora and fauna of Assam is nothing short of stupendous.

5. Mr. R.N. Sonowal, Divisional Forest Officer. Having spent the longest stint of 16 years in Kaziranga, both as Range Officer and DFO, Mr. Sonowal is a veritable gold mine of information on the habits and behaviour of the Indian rhino. He also is highly knowledgeable about the wildlife of Assam.

6. Mr. Hari Prasad Phukan, DFO, Assam State Zoo. Joined the Forest Service in 1974, and spent around 5 years in Manas. Has authored a book on the Bird Mystery of Jatinga.

7. Dr. Abedul Hussain, Forest Veterinary Officer, Assam State Zoo. A doctor with over 30 years of experience, Mr. Hussain is greatly devoted to the cure of ailing animals in his care.

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11. Mr. Romesh Gogoi, Ranger.

12. Mr. Dharanidhar Boro, Ranger.

13. Mr. Tosheswar Bora, Forester I, with 18 years of experience.

14. Mr. Harish Chandra Gogoi, Forester I, with 31 years in the field.

15. Mr. Tarun Chandra Roy, Forester II, with 17 years of experience.

16. Mr. Jogeshwar Deuri, Forester II, with 16 years of experience.
17. Mr. Thuleswar Hira, Head Mahout, with 29 years of experience.
18. Mr. Earnesh Momin, with 31 years of experience as a mahout.
19. Mr. Koney Borang, with 25 years of experience as a mahout.
20. Mr. Bapti Gogoi, with 25 years of experience as a mahout.
21. Mr. Muhidhar Gogoi, Motor Launch Driver for 31 years in Kaziranga.
22. Mr. Ashini Patowary, Forest Guard.
23. Mr. T.C. Talukdar, Veterinary Field Assistant, Assam State Zoo.
24. Mr. Krishna, K. Mech.
25. And many others.

PREFACE

THIS book had its genesis during the premiere show of a film whose title, appropriately, was 'Rhino'. The film was based upon *The Kaziranga Trail*, one of my adventure novels for youngsters. *The Kaziranga Trail* turned out to be a bestseller and has been translated into a number of Indian and foreign languages.

My close friend, Mr. Ashok Saikia, Education Commissioner, Government of Assam, was sitting in the balcony with Mr. Durga Prasad Neog, Chief Conservator of Forests (General). Before the show began I spent a few moments with them. It was then that Mr. Saikia suggested I write a more comprehensive and authoritative book on the Great Indian One-Horned Rhinoceros (Rhinoceros Unicornis). Mr. Neog responded warmly to the idea, and promised all assistance if I embarked upon the project.

That was over a year ago. It took many visits to Kaziranga, numerous long and exhaustive interviews with individuals and hours of toil in libraries before the book began to take shape. Throughout this period I received help and encouragement from Mr. Saikia and Mr. Neog. Without their active cooperation the book would never have seen the light of the day.

Others have written on the Great Indian One-Horned Rhinoceros before. But in all those books the animal was, to use cinematic parlance, just one of the members of the cast, not the 'star'. As far as I am aware no book has been written for the lay reader specifically on this particular species. Thus the primary objective of this book is to compensate for the paucity of literature on the Indian rhino for the lay reader. If, in the process, the book has something to offer to individuals whose perceptions are more scientific, it will be an added source of personal gratification.

The Indian rhino, despite its endangered status, is one of the least researched animals. The reason for this is not far to seek. Research on a single species is not only time-consuming but also expensive. For instance, just to resolve the controversy whether bull rhinos display territory-dominating instincts, one will have to follow a number of animals for a number of years to discover whether set patterns of movement exist. To make a comprehensive scientific study of the animal would require a lifetime!

Some amount of research on the Indian rhino has been done in Nepal. Mr. Andrew Laurie's Ph.D. thesis for Cambridge University on 'The Ecology and Behaviour of the Great One-Horned Rhinoceros' based on his investigations in Nepal may be mentioned in this regard. There are also a few scholarly treatises by workers in Jaldapara and elsewhere. But for an animal that is poised on the edge of oblivion, this certainly is not enough. In Assam, which houses the world's largest surviving population of the Indian rhino, there has been no scientific investigation worth the name. While the results obtained elsewhere may be applicable to rhinos in Assam, there might be subtle variations because the operation of

The Great Indian One-Horned Rhinoceros

factor compensation, even of ecotypes, may intrude. Life forms with wide geographical ranges may develop locally adapted populations, with somewhat different physiological acclimation or modified behavioural mechanisms. Thus the lack of scientific research data or published scholarly treatises based on research work on the rhino in Assam indeed represents a sorry state of affairs.

This was basically my problem while collecting material for the book. The Indian rhino is not only under-researched, it is also an animal about which much that is false and fanciful has been written. If I were to base my book solely on my limited personal observations and experience of the animal, or on material already published, I too would fall into the pre-set trap of purveying information that may have little relation to reality.

Fortunately for me a ready alternative existed. The Assam Forest Department is staffed with men of knowledge and wide experience, who have literally lived for decades with the Indian rhino. Individuals such as Mr. P.C. Das, who retired as Chief Conservator of Assam forests after 37 years of active service; Mr. Durga Prasad Neog, with 32 years of experience in forest service; Mr. Sanjay Debroy, till recently Chief Conservator of Forests (Wildlife), whose three decades plus contribution to forestry, especially in building up the Manas Wildlife Sanctuary, brought him the coveted Norman Borlaug Award; Mr. P. Lahan, Conservator of Forests (Wildlife), one of the foremost authorities on the Indian rhino, with 24 years of experience, 10 of them in Kaziranga; Mr. R.N. Sonowal, D.F.O., Logging Division, who had perhaps the longest stint in Kaziranga, spending 16 years of his career there; Mr. Hari Prasad Phukan, D.F.O., Assam State Zoo. Dr. Abedul Hussain, Forest Veterinary Officer and Dr. Faridur Rahman, Pathologist, both attached to the Assam State Zoo, and others.

These were the men who unstintingly imparted to me their knowledge of the Rhinoceros Unicornis. Being qualified forest officers they were trained and equipped to observe and infer with the same scientific precision as any zoologist or naturalist. They also provided a wealth of personal anecdotes and experiences which I have woven into the book's fabric. I unhesitatingly acknowledge that the bulk of the material for this book has been gleaned by me from the lengthy interviews I had conducted with these individuals.

Both Mr. Neog and Mr. Debroy had urged me to visit Kaziranga with the express purpose of meeting the field personnel and obtaining their observations. I agreed and found it a rewarding experience. What bowled me over was the ready enthusiasm with which these people—foresters, mahouts, *ghasis* and villagers—shared their observations with me. I particularly acknowledge the assistance offered by Mr. G. Saikia, Ranger, Kohora Circle; Mr. Promod Mahanta, Forester I, who has been in Kaziranga for 22 years; Mr. Romesh Gogoi, Ranger, Mr. Dharanidhar Boro, Ranger, Mr. Tosheswar Bora, Forester I (18 years of experience),

Mr. Harish Ch. Gogoi, Forester II (31 years), Mr. Tarun Ch. Roy, Forester II (17 years), Mr. Jogeshwar Deuri, Forester II (16 years), and others. Among the mahouts I interviewed particular mention must be made of Mr. Thuleswar Hira, Head Mahout (29 years of experience), Mr. Earnesh Momin (31 years), Mr. Koney Borang (25 years) and Mr. Bapti Gogoi (25 years). Mr. Muhidhar Gogoi, a motor launch driver with 31 years in Kaziranga, Mr. Ashini Patowary, Forest Guard and Mr. T.C. Talukdar, Veterinary Field Assistant, Assam State Zoo, also contributed their bit.

Quite a few of these field personnel have spent years in Kaziranga, in everyday proximity to the Indian rhino. Such is the range of their experience that they can identify individual rhinos from distinguishing marks such as a torn ear, a scar or a particular pattern of behaviour. However, their observations were not always of a precise, scientific nature—it would have been unrealistic to expect it of them. Contradictions in individual perception were bound to crop up, and whenever these occurred, I have been careful to check and cross-check before arriving at a conclusion. I discovered that the basic observations were invariably similar, the difference being of a quantitative rather than a qualitative nature.

The knowledge and experience of forest personnel, who have battled with natural calamities and poachers to keep the Indian rhino alive, constitute the core of this book. Their observations have been supplemented by my perusal of the limited literature available on this animal. Thus my role, as far as this book is concerned, has been that of an instrument rather than an agent. In all humility I acknowledge that I am merely a conduit for the knowledge and experience of others, and apart from collating the information gathered by me and transcribing it into the written word, I have done precious little else to deserve my name on the title page.

Individual observation, however, is no substitute for systematic study. The Great Indian One-Horned Rhinoceros is one of the oldest land mammal species existing, and is of immense cognitive value to scientists. It has retained its original characteristics for millions of years and can provide scientists with a deeper insight into the process of evolution. This rhino is also an indicator species of the wetland eco-system, one of the most complex eco-systems of the world. Studying it in relation to its habitat can enable scientists not only to understand the components of the wetland eco-system, but also the mysterious working of Nature herself.

Moreover, the Indian rhino is an endangered species, and has the dubious honour of being listed in the *Red Data Book* of the I.U.C.N. It is difficult to conserve an endangered species unless we have thorough knowledge of it. Serious research on the Indian rhino is a *sine qua non* if it is to be freed from the danger of possible extinction. A great deal of scientific research has been done in the case of the two equally endan-

gered African species of the Rhinocerotidae family. We know much more about their social instincts, mating habits etc. than we do about the three Asiatic species. For example, in order to study whether the African species display territory-dominating instincts and the extent of their home ranges, scientists insert miniature radio transmitters into holes drilled in the horns of tranquillised animals, and monitor their movements for long periods. I am told that such telemetric monitoring has been carried out in Nepal, but as far as I am aware, nothing like this has been contemplated in India.

There is no dearth in India of scientists willing to take up the difficult and time-consuming challenge of systematic study of an animal like the Indian rhino. Scientific research, however, is prohibitively expensive and funds are not readily available, especially in a developing nation like India. But surely in these days of growing awareness of the need of conservation, international agencies with adequate monetary resources can fund research on the Indian rhino. If this book can motivate even a single zoologist to take up research on this animal and an international agency to finance his or her studies, I shall consider my effort worth the while.

This book, based as it is on individual observations, can make no pretensions to being a scientific work, nor is it meant to be one. My objective in writing it is to acquaint the lay reader with the Indian rhino, its history, generic characteristics, habitat, temperament, behaviour and habits, and the reasons that have pushed it to the brink of extinction. Although I have had to make use of the little scientific material that is available, I have endeavoured to reduce it to the simplest terms compre-

A solitary rhino quenching thirst.

hensible to the ordinary reader. Technical jargon has also been kept to the minimum and explanations offered wherever possible.

The conclusions that I have arrived at regarding behaviour, habits, instincts etc. of the animal, because these have been based on random individual observations, are open to correction through proper scientific scrutiny. At the same time, while studying animals, we tend to forget that there might be differences in the psychological make-up of individual animals of the same species, just as there are differences in human beings. A placidly disposed rhino, on seeing a domestic elephant approach close, might give it a cursory glance, and resume grazing. But a hot-tempered one might consider such an approach as an unpardonable transgression, and charge. Random observations are also not reliable because the psychology of a particular animal at that particular moment of observation has not been taken into account. Female rhinos, for instance, may possess temperaments more equable than males; but a mother rhino which has just lost her baby to predators can be so dangerous that even male rhinos give her a wide berth.

Conclusions about wild animals, unless they are the product of dispassionate scientific appraisal, can at best be of a broad, generalised nature. The same is the case with time factors. How long is the gestation period among Indian rhinos? I have received half a dozen different figures from half a dozen different sources. How long does a rhino live? Different published sources have quoted 40, 50, 60 and 70 years. Frank Finn, a conservationist of yester years, compounds the confusion by stating that "It is believed to be a grass feeder and to live for a hundred years." Time factors based on unsystematic observations can also be only of a broad nature. Greater and more systematic collection of data as well as a scientific approach is required for firmer specifics.

Despite the drawbacks inherent in my approach, I am hopeful that this book will serve the purpose for which it has been written. The salvation of an animal like the Rhinoceros Unicornis lies in creating greater awareness among ordinary people of the factors responsible for bringing it to the point of annihilation. Ironically, the fate of mankind is also linked to the fate of an animal like the Indian rhino, and its disappearance will be but another nail in the coffin of humanity. If today we create conditions that will entail the extinction of this animal, tomorrow conditions might be created that will see the extinction of mankind too. If my book can convey this simple truth, my labours would be amply compensated.

I am deeply grateful to Mr. Satish Bhattacharya, Secretary, Publication Board, Assam, for offering invaluable assistance while researching for this book, and to Mr. Dalip Kumar Neog for editing the manuscript.

ARUP KUMAR DUTTA

CONTENTS

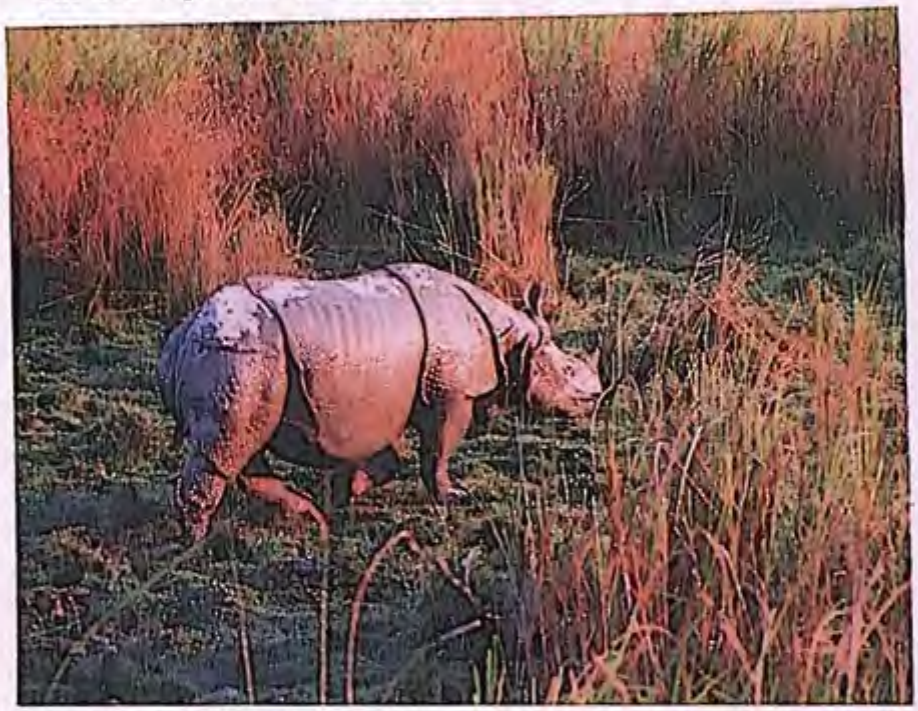
CHAPTER I

HORN OF THE UNICORNIS

KAZIRANGA National Park. A few minutes before sunset. The blood-tinged rays of the sinking sun seem to set the flat, undulating, grassy plains aflame. The huge pillars that rise like Brobdingnagians from the ground, with high voltage electric cables strung from one to the other, glow eerily in the amber light of the dying sun.

The sun dips over the horizon and dusk rushes breathlessly in.

"Her tubercled, armour-plated hide, short stocky limbs and the elongated, boat-like snout with a single horn on it impart to her an unearthly ugliness . . ."



Suddenly shadowy figures appear on the scene. Two men, dressed in black mingle with the half light. One carries a large roll of black wire, iron hooks at each end. The wire has been prepared for the job. Much of it still retains the original insulating material. But the insulation has been removed from one section, revealing naked copper.

One of the intruders uncoils the wire, twirls it deftly and flings it high in the air. The hooked end latches on to a high tension cable. His companion strings it along the ground ensuring that the naked portion falls over a much used *dandi* (animal track). The wire is bound to a bamboo shaft driven into the ground, so that it hangs a foot or so above the trail. The man takes the free end back to his companion who once more flings it in the air. The hook catches another adjacent cable, completing the circuit.

The wire throbs with powerful electric pulses. The deadly trap awaits its victim.

Hours later two animals appear on the *dandi* — a female rhino and her calf. Since late that afternoon mother and son had been grazing on a grassy patch by the side of a *beel* (small pool of water). Now they are returning to the thick cover of tall reed and elephant grass for a few hours of rest.

For almost a week this pair had been under close observation of the men who had set the trap. They know of the habits of the rhino. While grazing or seeking cover this animal moves to and fro over the same track. This makes it easier for them to lay their trap.

In the mellow moonlight the female rhino looks huge, monstrous and mysterious, a relic from some primordial past. Her tubercled, armour-plated hide, short, stocky limbs and the elongated, boat-like snout with a single horn on it impart to her an unearthly ugliness. Yet there is primitive beauty in that ugliness, a magnificent dignity in her lumbering, ungainly walk.

She ambles slowly over the path, conscious of the stirring in her womb. Her calf is over three years old. After the new one is born, the older calf will gradually separate from the mother and go his own way to a solitary, independent existence. But as long as he is with her, she has lost none of her protective instinct. She always makes him walk ahead of her, so that she can keep a wary, watchful eye over him.

That is why it is the calf who touches the live wire first. A thousand volts crackle through his body, momentarily paralysing him. Then he falls and lies motionless on the ground. Death is almost instantaneous.

The acrid smell of singed flesh suddenly fills the air. The mother utters a bewildered sound, half snort, half grunt, and runs to her calf. Her eyesight might be poor, but her sense of sound and smell are acute. She had heard and smelt no danger till now. Yet there is her offspring, prone on the ground, emitting the reek of death.

The enormity of what had happened to the calf has not penetrated her slow working brain. She nudges him with her snout to make him stand and move. The very moment contact is made with the lifeless form, the currents course through her. Such is the force of the bolts of electricity that,despite her ponderous bulk,she is felled and killed instantaneously.

Early next morning, as the stars overhead pale and the first light streaks across the sky, the two men are back. Their eyes light up as they see the female rhino locked in a death embrace with her offspring. The risks of entering the park illegally and laying the trap had been great. But in the end it has been worth their while.

With extreme caution the men undo the wire from the overhead cables. One of them, wielding a *dao* (broad bladed machete), hacks at the snout of the giant beast. Because it lacks a horn, they are not interested in the dead calf. Fifteen minutes later they are off. In the bag slung across the shoulder of one lies the booty—the priceless horn of the fabulous Unicornis.

Much later circling vultures lead forest guards to the site of the killing. A postmortem on the female carcass reveals a fully developed foetus in her womb. She would have delivered a calf within a week. Thus, though the official record put it as two rhinos killed, the actual toll had been three.

A moonlit night at Kaziranga. Four men make their way cautiously over a rhino *dandi.* While moving through the cover the animal

habitually bulldozes its way through the tall and dense elephant grass, forming a kind of tunnel. It uses the same track day after day, making it bigger and broader.

The men's caution is not misplaced. If they encounter a returning rhino in the tunnel, there is nowhere they can run.

The equipment that they carry reveal their intentions. *Kodalis* (hoes) for digging, *daos* for chopping, sharp pointed spikes of bamboo, and empty hessian sacks. They cross the tunnel-like path safely, and emerge onto a clearing inside the cover. The stench of defecation at once fills their nostrils.

A rhino dung heap, a metre or so high and wide at the base. The men know the habits of the rhino well. While traversing the *dandi* the rhino will always deposit its dung at that heap. Other passing rhinos, attracted by the smell, will also use that heap.

The location is ideal. Without delay the men commence digging a pit, approximately two metres deep, three metres long and over a metre wide. Two men dig, the other two pack the soil into sacks and spread it at a distance to obliterate tell tale signs. It is a sweaty, grimy, perilous job. But if they succeed in their objective, the reward will more than compensate the sweat, grime and risk.

At last the pit is completed. A man descends and drives spikes of bamboo at the bottom, upturned, sharp points gleaming in the moonlight. They spread dried *ikora* reeds crosswise over the opening. Thatch and grass are piled over the reeds to camouflage the yawning trap beneath. Their job over, the men depart.

Some time later a male rhino comes trotting over the *dandi*. A mature bull, it sports a magnificent horn. Near the dungheap it swerves sideways from the beaten track. Abruptly the ground beneath it gives way. It had approached the pit-trap forefeet first, so falls heavily down. Two factors are responsible for its death. The heavy fall breaks its neck. Its underbelly is impaled in the spikes of bamboo.

But death does not come at once. It is a horrible, slow, gory, painful death. Its frantic struggles serve to push the spikes even deeper into its body. In its death throes it utters piteous sounds. But the heavy grass cover mutes its cries.

The men return two days later. By that time the animal is dead. The horn, long and thick, brings smiles on the faces of the men. One of them, an expert with a *dao*, quickly hacks out the horn. Then they depart, leaving a battered, mutilated carcass behind them.

A few days later foresters are attracted to the site by the vultures circling above. The men of the department, after removing the skull to report the killing, refill the pit so that another animal might not fall into it. The dead rhino, or what remains after the vultures had been at it, at least gets a decent burial!

End of a noble animal, brought down by poachers' bullets. Note the bullet mark on lower belly. The horn has been hacked off.

High noon in Kaziranga. The landscape blazes white hot. The marshy

grassland steams in the heat as it awaits the advent of the monsoons.

Three men move in a single file through an unbeaten track, stealthy and cautious. The one in the lead is a local villager. He carries a *dao* in his hand. He moves with confidence, apparently familiar with the lay of the land. The other two follow at his heels. Their features are mongoloid, their gait that of hillmen. Each of them carry an automatic carbine slung across the shoulder.

Abruptly the guide halts and signals for absolute silence and caution. He parts some grass and looks into a small clearing. At its centre is a tiny waterhole, semi-dry in the heat. Two rhinos are wallowing in this muddy patch.

The guide is familiar with the rhino's habits. During the hot part of the day they are to be found in wallows. That was what the two strangers with him wanted. They wished to kill as many birds, or rather, rhinos, with one stone as possible, they had jokingly said. He had been paid a hefty advance for guiding them to the spot. The rest they would pay after the job was done.

That there are only two rhinos in this wallow is sheer bad luck. But the moment is opportune. They had been careful to ensure that the warm breeze blew towards them, so as not to alert the beasts. Also rhinos are at their most relaxed while in wallows. The two in the mud are obviously enjoying themselves. That is why the three men had been able to approach so close without alerting them.

Suddenly the wind shifts. The all too familiar scent of their hated enemy—man—reaches the rhinos. The sound, as the two men unsling their carbines, compounds the alarm. Water splashes and mud sprays as the beasts scamper for the bank. One animal decides that discretion is the better part of valour, and attempts to flee. The other, a headstrong bull, charges straight at the enemy.

The afternoon silence is shattered by the sound of gunfire. The two men, unfazed by the monster hurtling towards them, fire in rapid bursts. One shoots at the charging bull, his companion picks up the fleeing one. The jungle reverberates to the noise of automatic gunfire. Wild fowls screech and fly up into the air.

Another poaching victim. In Kaziranga alone 235 rhinos were killed by poachers in 7 years from 1983 to 1989.

A stream of bullets thud into the body of the charging rhino, bringing it crashing down on the run. The animal attempting flight is brought down too, its hind portions blown off by the bullets.

The guide, an expert with the *dao*, races towards the fallen bull. Even as he is hacking away at the horn, the two killers race towards the other beast. Deeply wounded, it is struggling desperately to drag itself into the cover. A short burst in the head suffices to end its suffering.

Within half an hour from the start of the shooting, the two horns are in their possession. Before the forest guards in the nearby camp, alerted by the gun shots, can react, the three men disappear with their precious booty.

Of the millions of Great Indian One-Horned Rhinoceros (Rhinoceros

Unicornis, Linnaeus) that once roamed the Indo-Gangetic plains of the Indian sub-continent, barely 2000 remain. These are scattered in small pockets of Assam, West Bengal and Nepal. Even today, despite the protection offered by the forest department, persecution of this animal continues. In the Kaziranga National Park of Assam, which holds the largest concentration of the Indian rhino, 235 were killed by poachers during the seven-year period from 1983 to 1989.

In the same period 368 rhinos died in Kaziranga due to natural causes such as floods, old age and illness. This figure does not include rhino calves killed by predators. However, natural deaths are part of the life cycle and in no way affect the growth in the population of a species. But when natural death figures are supplemented by unnatural deaths at the hands of poachers, the total of 603 deaths in seven years becomes alarmingly high.

The International Union for Conservation of Nature and Natural Resources (I.U.C.N.), in its compilation of endangered animals of the earth, ominously titled the *Red Data Book*, has included the Rhinoceros Unicornis among them. The RDB contains a list of animals whose number has decreased below 2000. A species of which fewer than 2000 are left is considered to be on the verge of extinction, and special conservation measures have to be undertaken if it is not to be wiped off from the face of the earth.

If tomorrow the Rhinoceros Unicornis becomes extinct due to natural causes alone, it should be of little concern to human beings. Nature moves in inscrutable ways. If Mother Nature deems a particular species to be redundant to the delicate balance she maintains on our earth, that

Two rhino skulls, one of an animal which died naturally, the other killed by poachers.

In the former the nasal boss upon which the horn rests is intact, while it has been hacked away along with the horn in the latter.

species has no business to exist except perhaps as mummified specimens in museums of natural history.

But man-induced extinction is a different matter altogether. This is what the Great Indian One-Horned Rhinoceros is threatened with. The story is same in other rhino habitats. Despite the protection afforded by the army in the Royal Chitawan National Park in Nepal, occasional cases of rhino poaching continue to occur. In the Jaldapara Sanctuary in West Bengal the number of rhinos have declined from 88 in 1970 to 39 in 1989. In 1983, when largescale violence and anarchy prevailed in strife-torn Assam, opportunist poachers wiped out the entire rhino population of Laokhowa Wildlife Sanctuary. In 1988-89, when a section of tribals in Assam agitated for a separate homeland, poachers made use of the anarchic situation to kill many rhinos in Manas Wildlife Sanctuary.

What is the mystique surrounding this creature that threatens its very survival? Why is it that so many men risk their lives and limbs in pursuit of this beast? What are the properties associated with the horn and other organs of this animal that draw poachers to it like flies to treacle?

For an answer to such questions we have to briefly trace our path through history. This will enable us to see how, in the course of centuries, false beliefs came to be associated with this animal, ringing its death knell.

The loner of the wilds.

Since time immemorial animals have had the pride of place in man's mythical beliefs. Primitive man's attitude towards animals was one of wonder and awe. They outstripped him in strength, agility and fleetness of foot. Armed as he was with rudimentary, unsophisticated weapons, he was vulnerable to their attack. At the same time they provided him with meat for food, hide for clothes and shelter and furs to keep him warm. They were mysterious beings who brought death and devastation, as well as food and warmth. Primitive man, therefore, responded by worshipping wild animals.

But as epochs unfurled, man gradually grew ascendant over the animal kingdom. He learnt to tame some and gathered greater knowledge about others. But his knowledge even then was woefully inadequate and he retained the cult of animal worship. Early human civilisations continued to deify animals, especially domestic ones, and those wild animals that rendered practical service. The ancient Egyptians worshipped over a hundred animals, including cats, dogs, cows, sheep, birds and crocodiles. The cat, for instance, was deified because it helped to contain hordes of rodents which were responsible for bringing famines. The Egyptians not only depicted the goddess of fertility as a woman with a cat's head, but also built temples in honour of cats.

Even when not actively worshipped, animals continued to be associated with religious mythology. In ancient Greece and Rome gods were often symbolised by animals. Zeus or Jupiter was represented by the eagle, Poseidon or Neptune by a horse, Hera or Juno by a peacock, etc. Worship of the cow was prevalent in Persia, Africa and ancient Greece. Veneration of animals prevailed all over the world, in Europe, regions of Asia, and among primitive tribes of the Americas and Australasia.

In India the association of animals with religious mythology was particularly marked. The myriad gods and goddesses of the Hindu pantheon rode birds and beasts as *bahon* (means of transport). Lakshmi, the goddess of prosperity, travelled on an owl; Saraswati, the goddess of learning, on a swan; Durga, the goddess of power, on a lion. At every level there was an inter-linking of animals with religious beliefs. Shiva, the destroyer, was linked to snakes; Vishnu, the preserver, reincarnated himself into animal forms such as the fish, turtle and boar. The monkey king, Sugriva, helped Rama to defeat the evil king Ravana. The benign, pot-bellied Ganesh, mankind's benefactor, had the body of man but the head of an elephant.

Quite often in ancient societies animals were invested with an aura of religious mysticism because of man's desire to protect them. At a time when laws safeguarding animals were non-existent, a protective religious shield was used as an instrument of social conservation. The cow, for example, was an animal of indispensable utility to human society. It was thus given a divine status so that it would not be killed for meat. Krishna, one of the most beloved reincarnations of Vishnu, was a cowherd. Such was the homage paid by Hindu society to the cow, that the phrase 'sacred

cow' has come to denote anything that is inviolable.

Veneration was accorded to wild animals sometimes out of fear. Human settlements in the early days of civilisation were few and at great distances and set like islands surrounded by vast seas of wilderness. The settlements with their croplands were vulnerable to depredation by wild animals, such as elephants and rhinoceroses, and these were offered homage to prevent them from being angry, and wreaking havoc on the crops. Even today the elephant is called Ganesha and propitiated in many places of India so that it will not damage crops and destroy settlements.

In the case of the rhinoceros at least, other factors such as its grotesque, out of this world appearance, and the air of immense strength packed into a stocky body that it exudes, also contributed to its deification. It retained its enigmatic quality through the centuries and man, who venerates anything that he cannot comprehend, continued to wrap it in a mystical shroud.

As the centuries rolled away and man's understanding of Nature as well as the animal world expanded stupendously he ceased to worship animals and, instead, began to exploit them for his own benefit. But traces of the past cult of animal worship or animal deification remained in the form of superstitions. Animals had throughout their short stay on this earth played an intimate and indispensable role in man's life. Little wonder then that a majority of prevalent superstitious beliefs all over the world are centred around animals.

Today, despite our pretensions to being governed by principles of scientific rationalism, superstitions continue to rule our lives. A cat crossing the road is enough to bring traffic to a standstill. We continue to read omens and portents in bipeds and quadrupeds, herbivores or carnivores. Fortunately, in modern times, most animals are not persecuted for superstitious and fanciful beliefs, as they sometimes were in the dark ages, although they continue to be decimated for commercial reasons. The Rhinoceros Unicornis is an exception. Tragically, the deification in the case of this magnificent animal has also led to its crucification, and it continues to be a victim of mankind's foolish, superstitious hangovers.

From ancient times man has woven a web of mythical beliefs around the great Indian One-Horned Rhinoceros. One of the earliest legends that evolved in connection with this animal was that of the Unicorn, a fabulous animal which ancient accounts, significantly, described as being an inhabitant of India. The Unicorn was depicted with the body of a horse, but larger in size, bearded and with cloven hooves. On its forehead grew a single helical horn, perfectly straight, about 0.5 metre to 1 metre long. The horn was coloured white at the base, black in the middle and red at the pointed tip.

The mythical Unicorn was first depicted in the earliest of the Mesopotamian pictorial art. It was referred to in the ancient myths of

Mohenjodaro seal.

Side views of ashtray made from the foot of a rhino.

India, South East Asia and China. In China, as early as the 27th B.C., appeared a mythical creature, a prototype of the Unicorn, called Ch'i-lin. Ctesias (400 B.C.) in Greece described a single-horned animal of the size of a horse, white bodied, purple-headed and blue-eyed, with a half metre long horn coloured red, black and white. Despite its polychromatic attributes the actual model for Ctesias's description was the Indian rhino.

Marco Polo, the famous 13th century traveller who visited Asia, described the fabled Unicorn in his accounts. Again the actual beast described by Marco Polo was probably the Indian One-Horned Rhinoceros. Many extant pictorial depictions in the medieval art of Europe, the Islamic world and China depict the Hunt of the Unicorn.

The Unicorn was an enigmatic symbol and was used by the church as an allegory to interpret Christianity. The Bible compares the Unicorn to Christ, who raised up the horn of salvation for mankind. This idea was elaborated in the Western medieval world to allegorise the birth and death of Christ.

The Unicorn, especially its horn, was endowed with many alleged magical properties. According to legend the Unicorn could sweeten the murky waters of a pool by dipping its horn in it. It could also detect poisonous liquids with its horn. Those who drank from its horn received protection from stomach trouble, epilepsy and poison. It was also supposed to be the only animal that dared to attack elephants. Very fleet footed and difficult to capture, it could be tamed, however, by a virgin maiden.

Many such ancient beliefs associated with the Unicorn have tended to reinforce the magical properties that popular superstitions credit to the horn of the Indian rhino. It is quite possible that beliefs regarding the miraculous nature of the Indian rhino's horn already existed, and the leged of the Unicorn sprang out of these beliefs. For instance, a seal depicting the Indian one-horned rhino was discovered in the ruins of Mohenjodaro, a civilisation that existed around 3000 B.C. The very fact that the Indian rhino was depicted in a seal shows that this animal was of some significance to that society. In the same way, it is also quite possible that somewhere during the passage of time the legendary attributes of the mythical Unicorn rubbed onto the Rhinoceros Unicornis, spelling its doom. It is interesting to note that powdered rhino horn is an essential ingredient of traditional Chinese pharmacopoeia, China being one of the countries where the Unicorn legend was widely prevalent.

Hindu mythology also placed the Indian rhino on a highly revered pedestal. According to one popular legend the rhino was created as a *bahon* for Vishnu, one of the members of the Hindu Trinity. At that point of time the rhino did not have a horn on its snout. After saddling the beast Vishnu mounted it, but the animal proved to be obstinate and did not obey commands. It moved in its own way which made Vishnu angry. The Preserver, in his wrath, took off one of the *kharams* (wooden clogs) he was wearing and threw it at the animal. The rhino, beholding Vishnu's rage, did not flee, but bowed its head reverentially. The *kharam* hit it on

its snout and was transformed into a horn. Since the horn is made of an object that touched the feet of God Himself, it attained divine powers. Also, because the rhino had not fled, but had bowed before Vishnu, it emerged as a true devotee of the Lord!

Another legend prevalent in the oral folk-mythology tradition associates the animal with the Ramayana, the great Indian epic. When Lord Rama went with Sita and Lakshmana for 14 years of *vanovas* (sojourn in the wilderness), the younger brother took a vow not to eat food and not to look at a woman's face for the period of exile. Such a vow was needed to destroy Ravana's son, Indrajit, who had acquired extraordinary powers through *tapasya* (a long period of meditation). Lakshmana, it is said, never looked at Sita's face, only her feet. But although he was undertaking *vrata* (fasting), Sita, as the dutiful sister-in-law, continued to serve him food which he stored away. The food that was kept aside turned into an animal — the one-horned rhinoceros —after Lakshmana killed Indrajit.

The Indian rhino is also linked to Lord Krishna, another incarnation of Vishnu. One such legend is used to describe how this animal acquired the armour-like platings on its body. Lord Krishna, it seems, discovered that elephants were a hindrance in war because the mahouts were easy prey to enemy archers. Looking for an alternative, he picked out the rhino, dressed one in armour, and put it under training. But the animal was found to be too stupid to obey orders, and was sent back to the forest—with its armour still on!

In Assam, the 20th century home of the Great Indian One-Horned Rhinoceros, the Usha-Aniruddha legend once again links the animal to Lord Krishna to explain how it came to live in Kaziranga. Usha, the daughter of King Ban (King of Sonitpur), saw a handsome prince in her dream, and pined for his love. Her friend, Chitralekha, sketched one by one the faces of all the princes of India. When her pencil drew Aniruddha, the grandson of Lord Krishna, Usha recognised the prince of her dream. Aniruddha learnt of her love and came to Sonitpur to fetch her. But King Ban, who was averse to the marriage, threw Usha and Aniruddha into prison.

Lord Krishna, legend has it, came from Dwarka to the kingdom of Ban to rescue his grandson, riding a rhino. He left his *bahon* to graze in the plains of Kaziranga while he crossed the Brahmaputra to wage war with Ban. After the battle was over and Ban vanquished, it was time to take the lovers back to Dwarka. So Lord Krishna played on his flute to summon his *bahon*. But the rhino did not hear because the melody of the flute mingled with the sound of the Brahmaputra waters. Lord Krishna was furious and disowned the rhino. But the animal loved its new environment on the banks of the Brahmaputra, the cool ambience and the lush grass, and stayed back happily.

Another story with the Usha-Aniruddha motif was narrated to me, but with a slight variance. Lord Krishna, according to this version, actually

came on his rescue mission on an elephant. At Kaziranga he commanded his elephant, *"toi shil hoi thak"* (you turn into a stone and stay here). Lord Krishna then saddled a rhino, mounted it, and proceeded on his mission. A temple with an elephant carved out of stone, called *Hatipathar mandir* (stone-elephant-temple) still stands at that spot in Kaziranga.

An interesting corollary to such myths is the one that explains why the Indian rhino does not have hair on its body. While riding the animal Lord Krishna used a saddle strapped to the back and sides of the animal. Animal hide is ordinarily covered with hair and that too was the case with the rhino. But the heavy saddle wore the hair away from the body, and that is why the rhino has hair only on its tail and the tips of its ears!

Similar legends abound in the folklore of Nepal, Burma, Thailand, other South East Asian countries and China. The cumulative effect of such myth making was to invest the animal with a divinity that it neither deserved nor desired. Superstitions that sprang from deification have proved to be extremely tenacious, and today, though the former reverence is absent, the false beliefs remain. These have credited the rhino's horn, flesh and other organs with almost supernatural curative and rejuvenating powers, and thereby contributed to its slaughter.

The list of so called 'benefits' to be derived from the horn, flesh and other organs is indeed long. The meat and blood of the animal is considered to be holy—after all, this animal was created from the food meant for the gods! Even today, in many parts of India, Nepal and South East Asia, partaking of the flesh and blood of this animal is considered to be the surest passport to heaven! In fact, in certain regions, a person who has consumed the flesh of a rhino is in danger of being eaten himself! A forester in Kaziranga, who had the misfortune of having eaten rhino flesh and told some tourists about it, found to his dismay that his audience wanted to lick his flesh. Since they could not devour him, licking his flesh was a logical alternative, albeit a consolatory one!

Previously, when rhinos were aplenty in Nepal, the flesh and blood of the animal was offered to the gods. After a rhino hunt, those who took part would disembowel the carcass, enter the body and offer libation of the animal's blood. In Assam a villager who has eaten rhino flesh is given social respect. Apart from its holy status, rhino meat and blood was considered to have medicinal value. Chewing the dry meat was supposed to make one immune to dysentery. Neog recalls his childhood experience of a medicine his mother used to prepare at home as a cure for the ulceration of the tongue, which contained dried rhino flesh, borax and one or two herbal ingredients. But he does not recall if anyone was actually cured by his mother's nostrum!

High caste Hindus in Assam do not consume the flesh of all parts of the rhino, because of the popular belief that rhino flesh is half deer and half buffalo. Since these Hindus do not eat buffalo, one half of the rhino is considered uneatable. Others, however, especially Nepali Hindus, do eat

rhino flesh without such finicky considerations. Gorkhas believe that by eating the flesh and drinking the blood, the enormous strength of the beast would flow into their veins. Rhino meat is soft and edible, but not particularly palatable, since it carries a peculiar smell. The flesh tastes like pork, though of a stronger flavour and coarser grain. It is not much different from the flesh of other animals, and contains similar nutritive value. Two factors, however, have added to the superstitions regarding its flesh and blood—its phenomenal strength and the fact that in the wild state the rhino is extraordinarily disease resistant.

The preference for rhino flesh is dying out, chiefly because of its unavailability. Poachers in game sanctuaries, for obvious reasons, cannot carry the carcass away and take only the horn. Even then the hankering is there, and rhino carcasses are stripped of flesh whenever the opportunity presents itself. Neog relates an incident that took place when he was a D.F.O. at Jorhat which illustrates this. A rhino was killed by a speeding truck as it was crossing the National Highway outside the confines of the sanctuary. On receiving this information he set off immediately for the spot. But in the couple of hours it took him to get there, the animal had been stripped to the bones by tribals living nearby.

Das narrates a highly interesting personal experience to show how people still clamour for rhino flesh. On a night in January, 1984, two male rhinos, while engaged in mortal combat on a railway track near Thakurkuchi railway station, were hit and killed by a speeding train. Forest staff arrived to collect the horn, and a police picket was posted to guard the two carcasses till veterinary doctors could conduct postmortem examinations. Meanwhile, from early morning, a sizeable crowd, keen on acquiring rhino meat, gathered at the site, armed with *daos*, axes, *khukris* etc. By the time the veterinary and forest team arrived, the crowd had swelled to five thousand strong, and the police were hard pressed to keep it at bay. As soonas had the postmortem team departed, the crowd disregarded all attempts by the police to regularise affairs, and broke through. A mad scramble followed, with *daos* and other sharp weapons hacking away—in the confusion the little finger of an old man was accidentally chopped off . A few days later when Das, in his capacity as Chief Wildlife Warden, visited the spot, only parts of the vertebra of the unfortunate animals were to be seen at the spot.

The urine of the rhino is also considered to possess extraordinary properties. In Nepal it is hung in a vessel over entrances to safeguard the household against ghosts and diseases. Drinking the urine is considered to be a cure for a number of skin diseases, asthma, epilepsy and other ailments. Many zoos sell rhino urine for which there is a great demand. It is true that rhino urine, which contains uric acid and acts as an antiseptic, may have some small medicinal value. After all some human beings drink their own urine for 'medicinal purposes'!

In fact almost all organs of the rhino are supposed to have beneficent value. A sliver of bone inserted into any part of the body imparts the

rhino's power into the fortunate recipient. If the umbilical stump is boiled and the soup drunk, rheumatic and arthritic complaints are cured! For swellings caused by physical injuries the treatment recommended is a plaster of rhino dung. Various bits of the rhino's body such as a nail or a piece of its tail are treasured as bringing good fortune to the possessor. Rhinoceros feet also make fine ashtrays — a usage which is abhorrent, to say the least!

Some Hindus also believe that if the gelatinous, bowl like boss by which the rhino's horn is attached to the snout is used to give 'pinda' after cremation, the individual as well as his progeny would ascend directly to heaven. A belief once prevalent in Assam, that if a rhino enters someone's paddy fields or drops its dung in a vegetable patch, it is a very auspicious omen, shows how false beliefs change with the change of circumstances. In former times, when virgin forest and grassland tracts were abundant, a rhino rarely raided human crops. As their number dwindled due to ceaseless persecution, such visitations became rarer still. So the myth evolved that if this godly creature entered someone's paddy fields, that individual's prosperity was assured.

Neog narrates how formerly forest personnel would use this myth to assuage villagers whose crops had been damaged by the animal. Some years back, for instance, a rhino gave birth in the vegetable patch of the *gaonbura* (village headman) of Mayong, adjacent to Pabitora Wildlife sanctuary, causing considerable damage. The irate *gaonbura* demanded compensation when forest officials visited the spot. The D.F.O. pointed out that since Vishnu's *bahon* had condescended to visit his backyard and give birth, his prosperity was assured. This not only assuaged the ruffled feathers of the *gaonbura,* but he was later heard boasting before the villagers that of all the households in the area, Vishnu's *bahon* had chosen only his house!

But, with the steady increase in the number of rhinos, such a belief is a thing of the past. Villagers around Kaziranga and other rhino habitats now consider the animal to be a pest, for during scarcity conditions, the animal makes frequent incursions into village paddy fields. In fact, the forest department has raised a special crops protection force to keep the animals away from village cultivations.

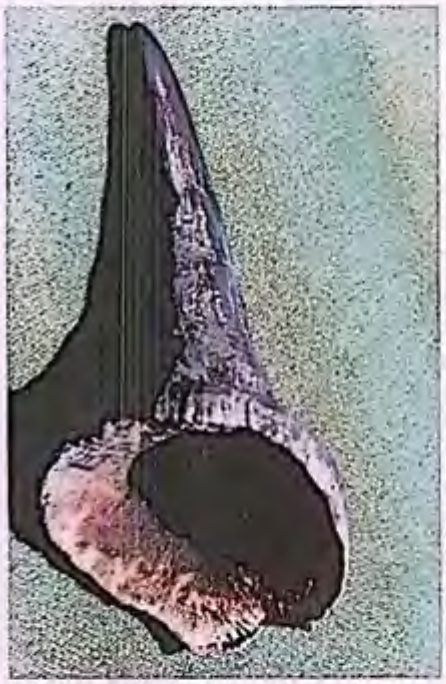
However, of all its organs, it is the horn of the Unicornis that is most sought after, being literally worth its weight in gold. Since ancient times magical properties have been attributed to the horn. Like the fabulous Unicorn, the horn of its namesake in the animal kingdom was supposed to have powers of detecting poison. Thus a goblet wrought out of the horn could protect its owner from any type of venom. If a secret enemy, for instance, served poisoned wine in a rhino horn bowl, it would break into pieces. Another variation of this belief asserted that the wine would start frothing if poured into such a goblet!

Medieval rulers were in perpetual terror of being poisoned by their rivals. Rhino horn cups were therefore in great demand. It is surprising

how widely this superstition gripped rulers all over the world. Whether it be European monarchs, sheikhs from the Arab sheikhdoms, kings of Eastern Asia, the Ranas of Nepal, the Mughal monarchs, crowned heads of India's princely states, each carried his personal rhino horn goblet wherever he went! Even Popes in medieval Europe used such goblets, as did the Ahom Kings of Assam, and the heads of Assamese *Satras* (Vaishnavite institutions). It is not recorded how many monarchs saved their uneasy heads through this precaution, but there must have been quite a few who paid dearly for their credulity. Some of these 'magical goblets' can still be viewed in museums.

Another fanciful belief is that powdered rhino horn could sharpen jaded sexual appetites and restore manly vigour. The rejuvenating properties of the horn and its prowess as an aphrodisiac are still widely believed in some parts of India and South East Asia, and this acts as a powerful incentive for the persecution of the Rhinoceros Unicornis. The various legends apart, two other factors serve to perpetuate the myth of the horn's aphrodisiac properties. From ancient times the horn, because of its shape, was believed to represent the *linga*, or the male sexual organ. At the same time the rhino's period of copulation during mating is

Forest staff refilling a pit trap dug by poachers.



Of all its organs, it is the horn of the Unicornis that is the most sought after, being literally worth its weight in gold.

inordinately long, in fact far longer than other animals of the bigger variety. Perhaps these two characteristics have convinced hopeful homosapiens that taking powdered rhino horn would impart similar prowess to their dwindling libidos!

Rhino horn is also credited with wonderful medicinal properties and in its powdered form accounts for much of the usage of those available in the clandestine market. It is not very prevalent in the traditional system of medicine in India, except in a limited way in Gujarat and Assam. But Chinese pharmacopoeia firmly believes that medicinal properties exist in the horn. The Chinese traditional system of medicine, like the Ayurvedic system in India, uses natural components. But while Ayurveda confines itself to natural herbs, the powdered horn of the rhino is indispensable to the Chinese system. They even specify on the bottles that the medicine contains genuine rhino horn ingredients. Such medicines are sold all over South East Asia as cures for a wide variety of ailments such as influenza, stomach disorders, headaches etc. though its chief medicinal value is supposed to be of an antipyretic nature. In South East Asian countries the demand for the rhino horn is proportional to the presence of ethnic Chinese population.

Apothecaries in medieval Europe also advertised the so-called medicinal value of the horn. Fortunately such beliefs no longer exist in that part of the globe. Curiously enough, the horn of the African species of two-horned rhino is not in great demand either as an aphrodisiac or medicine in the traditional Chinese system although there is, for obvious reasons, a far greater supply of such horns. African rhino horns, however, have a lucrative market in Asian countries such as Korea, as

The horn, because of its shape, is believed to represent the 'linga'. This serves to perpetuate the belief in its supposed aphrodisiacal powers.

well as the oil rich West Asian countries, mainly South Yemen, where they are used to make dagger handles because Arabs consider a dagger with rhino horn handle to be both prestigious and propitious.

Apart from such diverse usages, rhino horn is directly or indirectly used for numerous other purposes. In Nepal on *shradh* days (after-death rituals), a libation of water and milk is poured from a rhino horn cup. In many South East Asian rituals an *argha* (a spoon-like receptacle used in sacred ceremonies to pour out libation) made of rhino horn is used, in the belief that any impurities in the liquid would be neutralised by the rhino's horn. Small deities carved out from the horn are also in great demand and bought at high prices. Many tribes believe that a small piece of horn used as a charm makes the wearer invincible to enemies. Some tribes also bury pieces of horn in their fields to ensure a good harvest. In India rings made of rhino horn are used to guard against a host of ailments. Such rings are also supposed to prevent piles. Childless couples, people afflicted with lunacy etc. are given rhino horn rings to wear.

An Assam, Nepal and elsewhere many families secretly keep rhino horn pieces with them because these are supposed to bring wealth. Horns are sometimes kept submerged in a bucket of water, turning the liquid into a kind of elixir of life, which family members sip everyday. Keeping a rhino horn under the bed of a pregnant woman and making her sip this 'elixir of life', is supposed to make delivery easier. So, in parts of South East Asia, persons owning rhino horns rent them out to expectant mothers at exorbitant prices!

Lahan relates an amusing anecdote about an experiment that was tried in Kaziranga. The wife of a range officer was expecting—so she was made

False rhino horns of which there is a flourishing market.

to sip water in which a rhino horn was kept, from a cup made from rhino horn. As an additional precaution a horn was also placed under her bed. Since horns of rhinos killed naturally are kept for safe custody with the Kaziranga forest personnel, they could indulge in such experimentation. But the result, according to Lahan, was an absolute failure, for that particular delivery was a very difficult one, and almost ended in disaster.

Many such beliefs regarding the so called miraculous powers of the rhino horn flourish even today, all equally foolish, but some downright preposterous. Roadside apothecaries often attempt to dupe gullible customer by passing off spurious stuff as genuine horn by showing one such 'miracle'. Rhino horn, as already stated, is supposed to cleanse liquids of all impurities. So the charlatan will drop a piece of the 'horn' into a glass of water to which ink has been added. A few minutes later, after a lot of abracadabras and mumbo-jumbo, the ink would vanish and the water would become colourless.

The explanation behind such a phenomenon is, of course, ridiculously simple. There are two types of ink, permanent and washable. The latter type will vanish from water of its own accord after a while. The vanishing process will be even quicker if a porus substance (for example, charcoal) is dropped into the tumbler. A simple test is enough to judge whether a piece of horn is genuine or not. A genuine piece of horn is very hard; just to flatten it many blows with a hammer will have to be delivered. It is very difficult to cut, tear or scratch. So if a piece of 'horn' is beaten with a hammer, its pretensions to being genuine will soon be exposed.

In fact, in Assam and elsewhere, side by side with trafficking in genuine rhino horn, a parallel 'trade' in spurious imitation horns also flourishes. On many occasions the authorities, acting on tip-offs, have nabbed suspected poachers, only to discover that they had false horns in their

A genuine horn beside two false ones.

possession. A false horn is usually made of bamboo or buffalo horn coloured to look like the original, with pieces of genuine rhino skin attached to the base to lend a touch of authenticity. Dealers in false horns not only take advantage of a buyer's gullibility, but also the fact that the transaction, because of its illegal nature, must be a hurried one, where the customer has no time to inspect the wares properly.

But serious attempts have been made by conservation agencies to chemically analyse the horn of the Unicornis, in order to explode the myth of its aphrodisiac and medicinal properties. The horn, of course, is not a horn at all, but a compact mass of agglutinated hair. The magazine *Cheetal* (Vol. 10, No. 2, 1968) reported that in 1967 the International Union for Conservation of Nature and Natural Resources had analysed samples of the rhino horn and found it to contain no known aphrodisiac components. Tests were conducted in chemical research laboratories in Basle, Switzerland and it was discovered that the rhino horn is composed of Keratin tissues (a fibrous protein, the chief constituent of hair). It is totally inert, displays no chemical reaction, has no biochemical or hormonal properties, and possesses no medicinal value whatsoever.

An uncovered rhino pit trap.

If, despite such clearcut evidence that the so called aphrodisiac and medicinal properties of the horn of the Unicornis are nothing but figments of popular imagination, conservationists and experts refuse to commit themselves, it is only because this horn for centuries has been extensively used in Chinese pharmacopoeia, and is a part of the 'traditional Chinese wisdom'. It is difficult, of course, to contradict a usage that has been prevalent for thousands of years and thus most assertions against the possibility of the rhino horn having potential aphrodisiac or medicinal value, understandably, have a big 'but' appended to them.

This was made clear after the Convention for International Trade in Endangered Species of Flora and Fauna (CITES) came into existence in Washington on 3rd March, 1973. Under this convention signatory countries cannot engage in trade, both internal and external, of any endangered animal, or products derived from any endangered species. India being a signatory had to stop the existing system of selling accumulated rhino horn. Other signatory countries too cannot import rhino horns. Thus legal trading in rhino horn was stopped. The problem countries like India and some in Africa faced was what to do with the accumulated stock of horns? In Africa this accumulation was greater because not only do African rhinos have two horns, but these are bigger. One school of thought advocated total destruction of all accumulated horns, because by fixing monetary value to these encouraged poaching and illegal trafficking. But a second school of thought emerged which argued that although we do not have sufficient knowledge today, in some future time we might suddenly discover that rhino horns have great value. This school of thought was of the opinion that without greater research it is impossible to assert that rhino horn has no value, for the

myths of today might well be the realities of tomorrow. Since it was an animal product, why not keep it for posterity?

The upshot of this controversy was that the world body could not take a decision whether to destroy or preserve such animal products. But the consensus opinion that finally emerged was that these should not be destroyed. Thus except for Botswana which has destroyed all its accumulated horns, other CITES signatories like India continue to hoard their accumulated horns in the fond hope that posterity might one day proclaim them to be of great value.

Such reasoning clearly shows that mankind continues to look at conservation from its own point of view—for human self interest—rather than from the animal's point of view. The basic question that should have been asked was not whether the retention of the accumulated stock of rhino horns might benefit mankind, but whether it would benefit the rhino. No doubt the new meaning of conservation is wise use of natural resources without destroying them. But by keeping the horns in the hope that they might yield something for human beings in the future we are merely providing fuel to the age old superstitions about possible benefits to be derived from them. On the other hand, by destroying them, we might have at least prompted their users to seek other alternatives.

Even if, purely for the sake of argument, we grant that the rhino horn does have aphrodisiac or medicinal value, what will happen if the 2000 odd animals yet alive are wiped out and the species become extinct? Would not Chinese pharmacopoeia then have to find alternatives? As is clear, rhino horn in medicines is used for its supposed antipyretic and aphrodisiac properties. Surely in this age of modern medicine some substitute can be formulated for the same purpose?

In fact, international conservation agencies, such as the Survival Service Commission of the IUCN, have suggested the use of synthetic substitutes in Chinese pharmacopoeia to prevent the few rhinos remaining from being poached upon by horn traffickers. The Commission went to the extent of considering the possibility of putting an artificial substitute in the market. But the ethics of putting such a spurious substitute was questioned, and the idea was finally dropped.

With the kind of miraculous properties attributed to the horn, flesh, blood and organs of the Great Indian One-Horned Rhinoceros, it is a wonder that it has survived at all. Throughout the centuries hundreds of thousands of them have been sacrificed at the altar of human superstitions. Two aspects of the animal's horn invest such killings with greater poignancy. First, the Indian rhino has no earthly use for its horn. African rhinos do employ their horns as weapons of offence and defence, to dig out roots and, during times of water scarcity, to dig dry river beds. The Indian rhino, on the other hand, contrary to popular belief, does not use its horn, but its cutting teeth, while fighting. Thus, while the horn is sold at fabulous sums, it has absolutely no practical value to the animal and exists only in the form of a useless appendage.

Moreover, the horn is not fixed to the skull but rests on a bony boss, and can be knocked off by a hard blow. If by accident the horn is dislodged, there would be slight bleeding, but later another horn will grow in its place. Thus, ironically, a rhino does not need to be slaughtered in order to be deprived of its horn.

The rapacity of human beings knows no bounds. Man through the ages has killed animals for sport or gain. Even in modern, enlightened times animals continue to be killed. But, at least in most cases, the animals that are killed do provide something useful to man, although this in no way dilutes the heinous nature of man's crimes against the animal world. The rhino is one animal that has been decimated not because it provides anything of even remotely tangible benefit to humanity, but to feed the superstition of credulous people. That is the tragic irony surrounding the horn of the fabulous Unicornis.

Although, for a while, some countries continued to dispose of their accumulated stock, the CITES, to a great extent, succeeded in stopping the legal trade in rhino horn. Till 1986, for instance, Singapore was the main market, but after it adopted CITES, it lost that status. Now the main disposal centres of illegal smuggled horns are non-signatory

The Great Indian One-Horned Rhinoceros.

countries like Taiwan and trade centres such as Macao.

When the supply of legally sold horns dried up, the effect was to boost up the price in the clandestine market to unimaginably high levels. It is, of course, impossible to keep track of the prices in such a market, given its secretive nature, but a comparison of past prices shows that while ancient accounts described the value of rhino horns to be 'half their weight in gold', today, in the clandestine South East Asia market, the value would be equivalent to that of gold itself!

In the beginning of this century in the Calcutta market its value was around £150-200 per horn. The average weight of an Indian rhino horn is around 750 gms. As per record of the Guwahati Forest Division, from where all Indian rhino horns were sold when, in the past, there was legal trade in accumulated horn, the biggest horn sold had a base circumference of 56 cm, height of 44 cm, length of 60 cm and weighed 2.894 kg. At the Guwahati sales the price secured was around Rs 65,000 per kilogram. A 1979 survey of International Trade in Rhino Horn put the price at 18,000 American dollars per kilogram in the Taipei market. Another report in 1986 stated that the prevailing price was 40 American dollars per gram of dry, powdered horn, which means a price of 40,000 American dollars per kilogram. Such fabulous prices prove to be the strongest incentive for poaching.

Naturally enough, with such profitable incentives and a starving market, the spurt in killing of the Indian rhino has also shot up lately, as a comparison of the following poaching figures in Kaziranga National Park would reveal.

Year	*1965*	*1966*	*1967*	*1968*	*1969*	*1970*	*1971*	*Total*
No. of rhinos killed by poachers	18	5	12	10	8	2	8	63
Year	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	
No. of rhinos killed by poachers	37	24	41	41	24	24	44	235

If the demand and high prices continue to prevail, it can be surmised that in the near future there would be even greater intensification of poaching. The figure of rhino killings in the first two months of 1990 (sixteen) is a pointer to this ominous trend.

The horn of African rhinos, weight for weight, is two-thirds cheaper than Indian rhino. In this not only usage, but also principles of demand and supply operate, for African rhinos being more numerous, there is a greater supply of their horns. But even there the persecution of the animal is so great that they are finding it difficult to keep alive the few rhinos left. It must also be noted that the value of the horn, like that of drugs, is not very high at the point of origin. In Assam, for instance, the local poachers will not get more than Rs 20,000 for their pains. But the horn keeps changing hands till it reaches the place of usage, its price increasing with each transfer, till the final street value reaches unimaginable proportions.

In rhino poaching a chain of operators is involved, one link leading to the next higher level. At the bottom of the chain is the poacher, who is paid by a petty financier, usually a local man, who himself is financed by a higher financier having links with international smuggling networks. Since the horn is small and of insignificant weight, it is not difficult for smugglers to evade customs check, and dispose it off in the international market. Such smuggling networks are known to operate from Bokakhat (nearest township to Kaziranga), Guwahati, Dimapur (township in Nagaland), Jakhalabandha, Calcutta etc. Another chain operates from Siliguri, which is close to three rhino habitats—Manas in Assam, Jaldapara in West Bengal and Chitawan in Nepal. The horns are smuggled through either the Calcutta (Siliguri)-Nepal-Singapore route, or the Calcutta-Singapore route.

Rhino poachers have traditionally used the pit system to kill the animal. Ironically, they were taught this method by the forest department itself. Since British times, before the tranquillising gun was invented, the forest department had been capturing rhino by digging pits on rhino *dandis*. Rhinos trapped this way were usually sent to zoos. Villagers hired to dig pits etc. learnt of the system and this has become the favourite method of poachers. It has the advantage of being a totally silent operation that can be carried out without alerting forest guards. Such is the effectiveness of the camouflage that even the most experienced forest guard finds it difficult to spot such pits. But whenever a pit-trap is discovered forest personnel refill it. If it is not possible to fill it immediately, they cut stems of *ikora* reeds and stick them vertically around the pit so that a rhino will no longer use that *dandi*.

Das tells of the time when a group of Forest Ranger trainees were taken to the site of a pit (without bamboo spikes) so that they could familiarise themselves with the camouflage technique adopted by poachers. As the local forest officer broached on the effectiveness of the camouflage, the Principal of the college, who had been listening attentively to the talk, took a step backward—and suddenly vanished from sight. He was rescued uninjured from the 'camouflaged pit', but the trainees were absolutely delighted with such a practical demonstration of the effectiveness of the camouflage.

Previously guns were not used for poaching, although European shikaris did hunt the rhino with rifles. This was not only because gunfire and the accompanying flash could alert forest guards, but also because of the curious belief among villagers that the rhino was impervious to bullets. The thick skin and seemingly invulnerable armour-like platings of the rhino contributed to perpetuate this belief. Even later, when they did discover that it could be killed by bullets, with the kind of unsophisticated weaponry at the command of local poachers, most extraordinary feats of shooting were required to bring down a rhino.

But for the past few years a dangerous trend has crept into rhino poaching—the intrusion of insurgents from North-East India into the

business. Previously the extremists from Nagaland, Mizoram and Manipur used to rob banks in order to acquire money for purchasing arms. But this was in the form of Indian rupee, while much of the arms purchase required foreign currency. Rhino horns, like drugs, have the advantage of being easily barterable, and arms can be procured without any hassles about currency. Rhino horns procured by insurgents are smuggled into Burma, which has become a major supplier of illicit horns to South East Asia. Since Burma does not have any rhino now, these horns obviously are the one got from Indian insurgents.

To serve the insurgents' purpose, large-scale collection of horns is needed, for which the pit method is inadequate. So more and more semi-automatic and automatic SLRs and carbines are being used to effect extensive killing of the animal. In such cases the extremists employ local villagers as guides. There have been quite a few instances when extremists from the north-east have been killed or captured within the rhino habitats of Assam. The intrusion of extremists and the use of automatic weapons also explain the rapid rise in incidents of poaching in recent years.

The devilish ingenuity of human beings and their capacity to destroy is limitless. This is illustrated by the growing incidents of poaching by electrocuting the unfortunate rhino. The poachers got the idea that animals could be killed this way from an unfortunate accident at a place called Tangla in Assam. A wild elephant had accidentally touched a high tension overhead cable and was electrocuted. Six other elephants in the herd were killed while attempting to rescue their companion.

The first incident of poaching by laying wires connected to high voltage electric cables over a rhino *dandi* took place in the Pabitora Wildlife Sanctuary in Assam. Since then there have been a few similar killings in Kaziranga too. The poachers often use very long wires to cover as many *dandis* as possible. This has posed deadly problems to forest personnel during night patrolling, when they are unable to distinguish the black wire in the dark.

Not that poachers always have to enter the protected sanctuaries to kill rhino. During the monsoons each year the plains of Kaziranga are inundated. Many animals flee and take shelter in the nearby Mikir Hills, where they are open prey to poachers. Also, whenever there is civil unrest and consequent anarchy, as prevailed in Assam in 1983 and 1988-89, wild animals are the first to suffer.

The constraints faced by the forest department in tackling poaching are many. Most of the rhino habitats are like islands of greenery hedged on all sides by populated villages. Poachers, who operate from these villages, can sneak in from any point, kill the animals, and then sneak out again. In the case of Kaziranga the sand banks on the Brahmaputra which flows on its northern boundary are full of human activity, and poachers often use these as bases for their operations. With no natural barriers to protect the perimeters, keeping a lookout for intruders

becomes a Herculean task.

The anti-poaching infrastructure erected by the forest department to combat poaching is also inadequate. The set-up at Kaziranga, for example, has a Director at the apex, with a D.F.O. and A.C.F. under him. The entire National Park is divided into three ranges — Kohora, Bagori and Agaratoli, with range offices under forest rangers in each. There are beat offices under each ranger, and every beat office has anti-poaching camps, numbering about 60 in the entire park. These are temporary structures that can be shifted, but there are also some permanent camps in strategic areas.

However, for manning these camps, the number of actual anti-poaching combatants available is only around 150 from the Director down to the Forest Guard. The 60 plus camps cannot be manned by such few people, so what the department does is to place a single armed guard in a camp, and strengthen it with unarmed casual labourers who are paid daily wages. Since only one individual in such a camp is armed, even if the staff encounter a gang of poachers, they are not able to apprehend the heavily armed intruders.

Added to the paucity of trained personnel is the antiquated nature of the firearms provided, lack of training in the use of arms, and absence of facilities for speedy and efficient communication. This is one of the oft-repeated complaints of the field personnel involved in anti-poaching operations. While the poachers of today come armed with sophisticated automatic weapons, the forest guards have to face them with outdated .303 rifles or .315 bolt action rifles with a magazine for five shots. While strengthening the number of combatants without proper motivation may not be the solution and may merely create problems of man management, equipping the existing staff with more sophisticated weapons and training them will go a long way in strengthening the anti-poaching structure. The creation of an elitist animal protection force in order to combat the extremist elements is worth serious consideration.

Yet, despite all the drawbacks and having to stay away from family and social life for long periods, the forest personnel have done a magnificent job of protecting the Indian rhino. Many have been wounded in shootouts with poachers and some have suffered death. Without the sacrifices of these personnel by now the Great Indian One-Horned Rhino would have become a relic of the past.

A major constraint in containing the menace of poaching is the inadequacy of existing laws protecting wildlife in general and the Great Indian One-Horned Rhinoceros in particular. In ancient times no laws existed for protecting wildlife. Man wove religious myths and sentiments around them and accorded them a privileged position in an attempt to safeguard them. The pitiable state of wildlife all over the world today shows that such religious shields proved to be of little use against human rapacity. Later, attempts were made by some enlightened rulers to impart

legalistic protection to wild animals. One of the earliest such monarchs was Ashoka, the Great. In his Fifth Pillar Edict of the 3rd century B.C. we discover the first laws to protect fish, game and forests.

Laws to protect the floral and faunal wealth of entire India were enacted only towards the end of the 19th century by the British. The Indian Forest Act (1879, 1927, 1950) gave basic protection to wildlife. Penalties for violation of the Act, however, were paltry—imprisonment upto 6 months or a fine of Rs 500 or both. In addition to the Indian Forest Act there was the 1887 Act for Preservation of Wildlife and Game or the 'Wild Birds and Animal Protection Act' as it became in 1912. Besides these there were separate acts for the states.

The Assam Forest Act of 1891 did not have any laws separately for the rhino. The Assam Rhinoceros Protection Act came only in 1954. Till then there was no attempt to strictly protect the rhino in Assam. Through the Forest Act of 1891 reserved forests were declared, and thereby the habitats of wild animal like the rhino were given legal status and protection. Forest officers were empowered to evict encroachers and prevent trespassing and exploitation of forest wealth such as fuel-wood was banned.

After India's independence the Indian rhino was given a special status in Assam because it had disappeared elsewhere. A special act for the rhino, called the Bengal Rhinoceros Preservation Act, 1932, had already been framed in Bengal. This act prohibited killing, injuring or capturing a rhino, except in self-defence or under licence. The penalty for killing or capturing rhinoceros was one month's imprisonment and/or fine upto Rs 1000. For the sale or purchase of any part of a rhinoceros there was a fine upto Rs 1000 and Rs 2000 for second conviction. Failure to report

A creature with a horn on its nose . . .

within three days the killing, injury or capture of a rhino was penalised with a fine of Rs 500.

The Assam Rhinoceros Preservation Act of 1954 was patterned on the Bengal Act, though the penalties were slightly more severe. It prohibited the killing, injuring, capture or attempt to capture the animal without licence, except in self-defence. The onus of proving self-defence lay with the person claiming it. Penalty for violation of the act was imprisonment upto one year and/or fine upto Rs 1000. The power to arrest without warrant and seize weapons was given to police officers not below the rank of Assistant Sub-Inspectors and forest officers not below the rank of Assistant Foresters. The latter were also empowered to search without warrant any building or enclosed place and to seize weapons etc. connected with a suspected offence.

The law currently in force, the Wildlife (Protection) Act of 1972, which was a Central act and adopted by Assam in 1976, has increased the penalty for poaching or trafficking in wild animal products. A person violating this act can be sentenced to imprisonment for not less than six months and extending upto six years.

With the rhino horn fetching staggeringly high prices, it is quite clear that such petty deterrents can hardly curb poaching. Moreover, forest acts are special acts and the lay magistrates are not attuned to the provisions therein. Here the onus of proving innocence lies on the suspect, while in ordinary law it is upto the prosecution to prove a suspect guilty. The common law also depends largely on evidence given by independent and unbiased witnesses. But in cases of encroachment and poaching within reserved forests there can be no witnesses except rangers, foresters or game-watchers, since no one else is allowed to enter without permission. But the very fact that a person is apprehended within a protected area should be suspicious in itself, for no one enters such an area without an express purpose. Such considerations are unacceptable to lay magistrates who always want independent witnesses. In fairness to these magistrates it must be conceded that their attitude is dictated by the possibility, however negligible, that a person might be picked up outside a sanctuary and charged with poaching.

Thus poachers who had been caught red-handed cannot be convicted because of lack of independent witnesses, since departmental witnesses are not considered to be significant. Lahan relates many cases where he had unearthed rhino horns in people's houses, and yet was unable to secure convictions. It is also difficult to prosecute forest staff who act in collusion with poachers.

Neog tells of a judgement delivered by a magistrate while he was D.F.O. at Jorhat in 1964. "A man was apprehended with a gun, cartridges and torch light at 2 o' clock at night in Kaziranga Wildlife Sanctuary," so said the judgement. "Witness No. 1, Range Officer; Witness No. 2, Beat Officer; Witness No. 3, Forest Guard; Witness No. 4, Game Watcher. There is no independent eyewitness. Thus the

prosecution has failed to prove beyond reasonable doubt that the person was not merely roaming inside the sanctuary. So he is acquitted." The suspect, however, was fined a nominal amount for trespassing. One of the facts that the learned magistrate had taken into account was that the man's gun had not been fired, which meant that he had been caught before he could do any damage with it. The learned magistrate had therefore concluded that no crime had actually been committed and set the man free. Neog and his fellow foresters knew that the man was a notorious poacher, but could only watch helplessly.

In the past there have also been a number of cases where the forest officer himself was arrested and charged with purloining the horn when he reported rhinos killed by poachers. In a game sanctuary the practice is that whenever forest personnel come across a carcass of a rhino, they remove the skull and report the killing. Other foresters on seeing a rhino without a skull know that its death has been reported. In deaths by poaching the skull, naturally, would be without the horn. But in many instances the police authorities counter-accused forest personnel of removing the horn themselves. Things grew so bad that many rhino killings went unreported. But today, because of strict departmental action, unreported rhino killings have become rare.

If poaching of the Indian rhino, as also other animals, is to be contained, the existing laws have to be made more stringent. When a human being murders another human being, he is punished with life imprisonment, and sometimes capital punishment. Even non-homicidal crimes such as armed robbery carry harsh punishment. Crimes against helpless wild animals are no less heinous than crimes against humanity, and deserve stronger punitive deterrents than a year in prison or a thousand rupee fine.

But laws by themselves are not enough unless there is a positive endeavour to implement them. The existing legal provisions, despite their inadequacy, are there—till new legislations are enacted these have to be rigidly implemented. "A lot of hue and cry is made," says Das, "when poachers are caught either by the Forest department or the police. But the interest seems to be rivetted in obtaining publicity in the news media, and later on it dies down. There are no sustained follow up efforts for prosecution either by police or the forest department. As a result there have been very few convictions in courts of law in recent years. "So, apart from more stringent laws, what is also required is a special apparatus for follow-up action such as Special Environmental Tribunals, with powers to summarily try those responsible for any form of environmental degradation.

"Can you guarantee the safety of gold or diamond in your own house?" asks Debroy. "We are trying to protect something in the wilds, which is a far more difficult task. We therefore need more stringent laws, their rigid application, and greater support from law enforcing authorities."

More than anything else, a change in social perspectives is required, if

poaching is to be contained. Social deterrents have always proved more effective than legal deterrents. A thief might escape the law, but the stigma attached to his profession will make it difficult for him to find a wife, or get his daughter married. Greater awareness among ordinary people will attach similar stigma to animal poaching and lead to the social ostracism of animal killers.

Without exception, forest personnel are unstinting in their praise of villagers around rhino habitats. "Assamese people are born conservationists", Neog asserts. "That is why the rhino has survived in Assam when it has been wiped out elsewhere." Neog points to the example of Pabitora which was declared a reserved forest for endangered animals like the rhino, only after local people pressurised the government to do so, surely a rare instance in the history of conservation in India. Field personnel in all the rhino habitats of Assam testify to the help they received from nearby villagers, without whose cooperation the forest department cannot proceed against poachers. Villagers inform the authorities against poachers, ignoring the risks involved, nor getting paid for the information. Thus in any successful anti-poaching operation, villagers are always in the background.

This despite the fact that it is these villagers who bear the brunt of depredation caused by the wild animals and are not recompensed for it. Injuries due to animal attack are very poorly recompensed, while damages to house or paddy are not compensated at all. Yet many villagers around Kaziranga have told me that they were proud to be custodians of one of the rare animals of the world. If these villagers are to retain their motivation, adequate compensation must be paid for damage to house and paddy caused by the wild denizens of sanctuaries.

Whatever steps at legal, social or other levels may be taken, the stark truth, however, is that as long as the demand for rhino horn and the price it commands exist, poaching will continue. What is needed, therefore, is a sustained endeavour to dispel the myths surrounding the horn of this uniquely magnificent creature, and expose the utter foolishness of the beliefs regarding its medicinal and aphrodisiac value. The horn of the fabulous Unicornis is nothing but hair, chemically inert and without any hormonal properties. One might just as well eat one's own hair for all the medicinal or aphrodisiac value it possesses! Only when this reality sinks home among the users will the beleaguered Great Indian One-Horned Rhinoceros find real safety in an increasingly inimical world.

CHAPTER II

HISTORY OF THE UNICORNIS

IF the Paleocene epoch (70 million years ago) of the Cenozoic era witnessed the first appearance of placental mammals on earth, it was the Eocene epoch (60-40 million years ago) of the same era that saw a varied wealth of mammalian development, when many forebears of modern animals first appeared. Fossil and other paleozoological remnants reveal that the ancestors of the family Rhinocerotidae first appeared during this period. Such fossil forms have been discovered in many locations in North America, Europe, Africa and Asia.

Thus rhinoceroses have been roaming upon the earth for more than 60 million years. Their fossil history is somewhat convoluted. They are believed to have evolved from the early tapiroids, but took a different evolutionary route. Hyrachyus, a forerunner of the rhinoceros, is known to have existed in the Eocene. There were several species of them, varying in size from that of a large dog to a horse. Though prehistoric rhinoceros species began to be recognisable towards the end of the Eocene, both in Europe and North America, the first form of which definite knowledge is possessed is Hyracodon of the Oligocene (30 million years ago) epoch. True rhinoceroses are probably the descendants of Hyracodonts, which had long, slender legs with three toes on each foot and typically rhinocerotoid cheek teeth.

The progress of the Cenozoic era saw several dozen genera that can be said to belong to the Rhinocerotidae family. The largest among these in the past were the Baluchitherium Gangeri and Indricotherium in the Oligocene and Miocene (25 million years ago) epochs. They were denizens of Asia, and were perhaps the largest terrestrial mammals ever known. Long-necked and having long forelegs, they stood about 5.5 metres at the shoulders, with a length of 9 metres and probable weight 25 tons—i.e., 4 times the weight of a present day African bull elephant!

During the Miocene a hornless species, Aceratherium, existed as revealed by fossils found in Europe. This animal's range stretched across Europe and Asia. During the same period similar species inhabited North America including one known as Diceratherium.

The rhinoceros, therefore, was common in North America in the Tertiary period and probably died out there during the Pliocene (10 million years ago). But in Eurasia many different species survived right upto the Quaternary period, becoming extinct only in the Pleistocene (1 million years ago). Large horns were a prominent characteristic of rhinoceros in the Pliocene epoch. In the Pleistocene there was the Coelodonta, or wooly rhinoceros, so called because of its thick coat of hair. Bones of this species have been found in almost intact form in caves and river beds from the British isles across Eurasia to China. The Coelodonta has been immortalised by stone age artists in cave paintings.

During the Pleistocene there was another species, Elasmotherium, which had an immense horn between the eyes, and which inhabited Siberia, Russia and Germany. Although considerably larger, this animal resembled the Indian rhino in appearance and was a grazer.

In India too the rhinoceros, like North America, Africa, Europe and other parts of Asia, made its first appearance in the Eocene. Apart from six species of rhinoceros, fossilised remains found in the upper layers of the Siwalik ranges and in other parts of the country reveal an unimaginable mammalian richness in this region during that period.

Geological upheavals, climatic changes, as well as biotic factors have ensured that most of the several dozen genera of the family Rhinocerotidae have become extinct. At present there are only five species distributed in four genera living in the world, two in Southern and Eastern Africa and three in tropical Asia. All five extant species today are also threatened with extinction due to interference by man.

The extant rhinoceros species are:

(1) The African White, or Square-lipped Rhinoceros (Ceratotherium simum).

(2) The African Black Rhinoceros (Diceros bicornis).

(3) The Asiatic Two-Horned or Sumatran Rhinoceros (Didermocerus or Dicerorhinus sumatrensis).

(4) The Lesser One-Horned or Javan Rhinoceros (Rhinoceros sondaicus).

(5) The Great Indian One-Horned Rhinoceros (Rhinoceros unicornis).

An aged bull rhino.

All the existing species are old world forms. A comparison of extinct species with extant ones shows seven main lines of evolution and descent, from which the lesser branches have diverged. Thus though all the extant species are externally similar, they differ a great deal in history and anatomy. Certain zoologists also attempt to further classify the animal, but such classifications have been shown to be merely subspecies of the same genus. The Sudanese White Rhinoceros, for instance, has been shown to be a different species from the South African White Rhino, although they in fact belong to the same species, despite the 3000 km distance separating them. While zoologists in the West were aware of the existence of the South African White, they came to know of the Sudanese White only in the 20th century, the first living specimens of which were brought to the Antwerp zoo only in 1950.

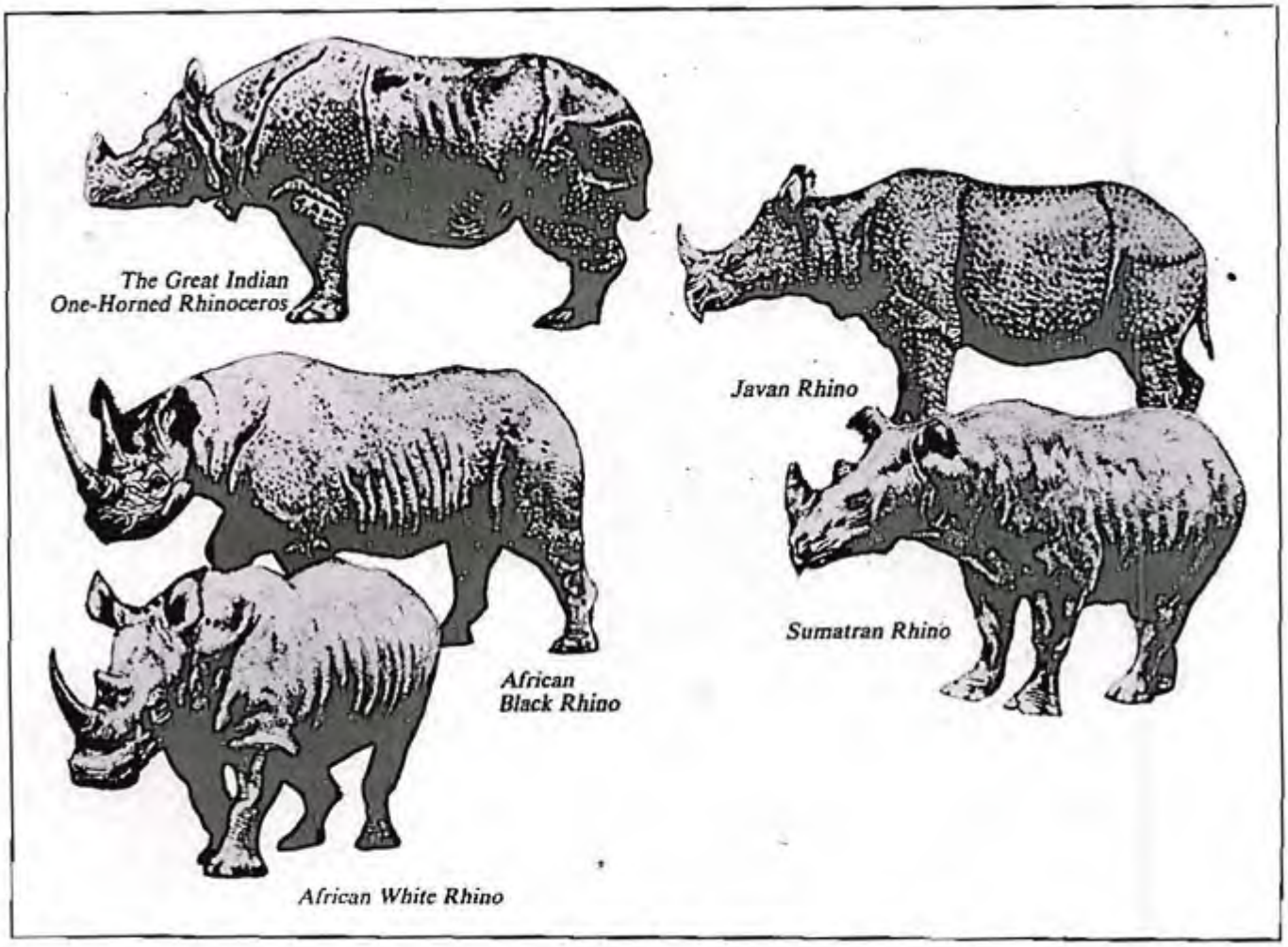
Naturalists in the past have also recorded the existence of fabulous rhinoceroses with outrageous characteristics, but these were nothing but figments of wild imagination. Such a tendency persisted even in the early 20th century, as the observations made by Frank Finn, in his book, *Mammalia of India,* written in the 1920's, show: "Mason says that the Karens are afraid of a 'fire-eating' Rhinoceros, the animal being

A mother rhino and calf beside a beel with a flock of ducks in the foreground and cover and jungle background.

supposed to attack fire. Blanford doubts this, but Mason quotes an African author on the propensity of one of the African species to do so. Rhinoceroses have poor sight, but good hearing and their scent is keen. They are touchy animals in some cases, and there would be nothing more wonderful in such a beast charging on the scent of fire and glare than in most mammals being scared by these."

The various species of extant rhinoceroses probably separated from each other and became distinct species millions of years ago. Though the genealogical histories of the African and Sumatran species are relatively well defined, the genealogy of the Indian and Javan varieties, both true and typical rhinoceroses, is somewhat obscure. No fossil remnants of these two species have been found except in South East Asia. Moreover, in India, the more ancient Siwalik beds do not show remains of these animals. But they appear with relative suddenness in the upper most and more recent beds in the forms of two species known as Siwalik Rhinoceros (Rhinoceros sivalensis) and Rhinoceros paloeindicus, the ancient rhinoceros of India.

The five extant rhino species



The African White Rhinoceros is not white at all—its actual colour is grey. The 'White' comes from the Afrikaan word 'weit' or wide, and describes the wide, square mouth of this animal. It is the second largest terrestrial mammal after the elephant. Formerly it was widespread in Africa south of the Zambesi river. Today it is confined to game reserves in Zululand where it has the largest concentration. Its northern counterpart was once prolific in Southern Sudan, Uganda, Zaire and the Central African Republic, where a much reduced population still remain.

The African Black Rhinoceros is the most numerous of all rhinos. Formerly it was distributed over great areas throughout Africa, from the Cape to South Western Angola, throughout Somalia, Ethiopia and Sudan, Northern Cameroons, Volta and Ivory Coast. Today it is to be found in much reduced numbers in South Africa, South West Africa, South Western Angola, Zimbabwe, Mozambique, Malawi, Zambia and Zaire. Northern Tanzania and Kenya have the largest concentration of the Black rhino, while some inhabit Somalia, Ethiopia, Uganda and Sudan.

In the first half of the 20th century the African species numbered over a million. But large scale killings by big game hunters and poachers have brought about a dramatic decline in the population. In the 1920's, for instance, the Frenchman Canon killed 350 rhinos in 4 years, while in the 1940's the Britisher John Hunter killed over 1,600 rhinos. As late as the '70s the Black rhino population in Africa was estimated at around 65,000. The figure quoted now in various reports places it at less than 4,000. Kenya, which in the '70s had a Black rhino population of about 20,000, today has less than a thousand of them. Civil unrest in many parts of Africa also contributed to the depletion. Even today the persecution of this animal in Africa continues, and wildlife authorities there are experimenting with translocation of the animals to safer, better protected zones to save them from being totally wiped out.

The Asiatic Two-Horned or Sumatran rhino is the smallest of the five species. In the prehistoric past it was the most widely distributed of the three extant Asiatic species, inhabiting a forest belt which stretched from the east coast of England southward and eastward across Southern France, Northern Italy, to India. It also ranged throughout Burma, Thailand, Cambodia, Laos, Vietnam, Malayan Peninsula, Sumatra and Sabah. Even to the end of the 19th century it was found in large numbers in Bengal, Tripura and the North East India, as well as South East Asia. By 1935 it had been greatly depleted, the second world war contributing to its being wiped out from much of South East Asia. Today, despite its once broad range, the Sumatran rhino survives in small, widely separated pockets in Burma, Thailand, Malaya, Sumatra and Sabah. Little is known of its status in Burma, which once held a subspecies, with slight physical differences. The total population of the Sumatran rhino is estimated at about 100, and some of the survivors in Sumatra are protected in reserves.

The Sumatran rhino is of great historical interest because, unlike the other two Asiatic species, it has hair on its body, thus relating it to some of the extinct species such as the Coelodonta or woolly rhinoceros. Also, being a two-horned animal, it forms a link between the Asiatic and African species.

The Lesser One-Horned, or Javan rhino, was once distributed throughout the orient, from Bengal and the North East India on the Southern side of Brahmaputra, through Burma and the Malaya peninsula to the islands of Sumatra and Java, as also Thailand, Cambodia and Laos. The recorded distribution of the species as known about 150 years ago saw three discrete populations of which only the nominate subspecies, Sondaicus, survives in only one population and at one place. What was believed to be the last animal in Malaya was shot for the purpose of preservation in an American museum of natural history. Today it is the most precariously poised of all rhino species, being restricted as a single population of 25-50 animals to the Udjung-Kulon Reserve in the western most extremity of the island of Java.

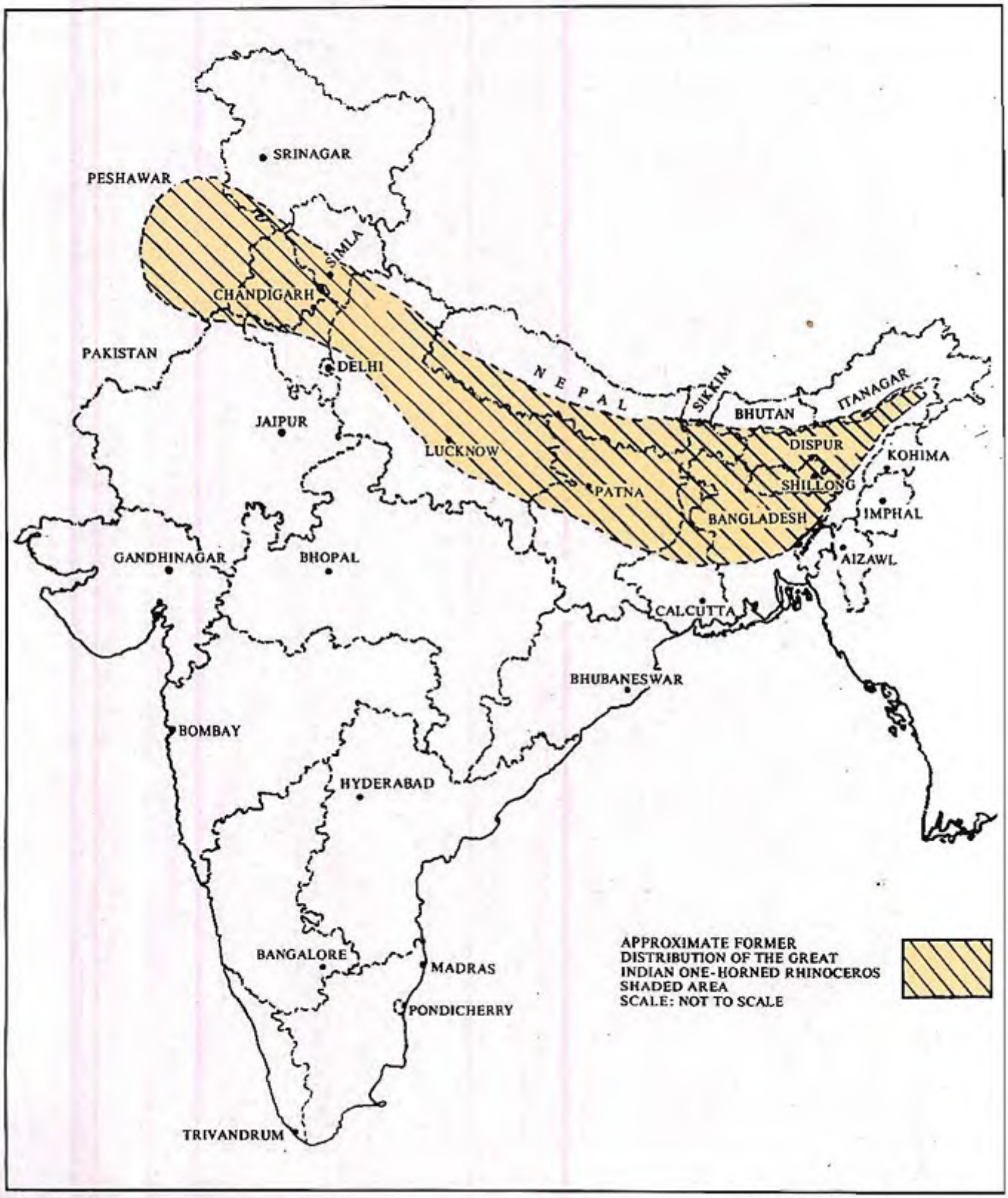
All three species of Asiatic rhinos were to be found in India in the prehistoric past. Fossil remnants in the Siwalik hills show that the Sumatran rhino existed in India during the Pliocene. All the three Asiatic species were to be found in Bengal and North East India well into the 20th century. Writing in the 1920's, Frank Finn states that the Lesser One-Horned's habitat extended 'locally from the Sunderbans east to Borneo' and the Sumatran's from 'Tipperah (Tripura) east and south to Siam and Borneo'. Finn also provides a picturesque description of the capture of a Sumatran rhino in Chittagong in 1868.

"The type of the hairy-eared variety was caught in Chittagong in 1868 owing to getting bogged in a quicksand. It was noticed that when approached by elephants when tied up she roared with fright and when conducted to a river could not swim, but only paddle enough to keep her head above water, so that she had to be towed. Anderson, however, heard of a rhinoceros being seen swimming in the Mugui Archipelago. The Chittagong rhinoceros above alluded to made a record price for a wild animal, the London Zoological Society having paid £ 1,250 for her."

Only one out of the three Asiatic species survives now in Assam and Bengal. The Javan rhino perished in the first few decades of the 20th century, while the Sumatran spcies existed in the Mizo hills till about 1935, after which it too disappeared.

Today, none of the five extant species of rhino can be said to be out of danger of extinction. Except for the Great Indian One-Horned, which in the last seven decades has shown a hopefully increasing trend mainly due to conservation efforts in Assam, all other species have dwindled in number. Thus an animal that once dominated the mammalian scene in the prehistoric past has today been reduced to a precarious condition.

The Great Indian One-Horned Rhinoceros previously occupied an



[*Courtesy*: Assam Forest Department]

extensive range across the whole of Northern India and Nepal from what is now Pakistan in the west as far as Peshawar and the North Western passes to Assam in the east. It is, however, not known whether its range extended further eastward through Burma and South East Asia, as that of the other two Asiatic species. But given the total absence of any fossil evidence or historical reference, this is highly unlikely. The Indian rhino was extensively found in the alluvial flood plains of mega rivers like the Indus, Ganges and the Brahmaputra, as well as the terai regions of Nepal and Sikkim. There are a host of historical and hunting references to show that it was present in large numbers.

The earliest relic of the animal was discovered by archaeologist at the Mohenjodaro excavations. It consisted of a seal bearing the figure of a one-horned rhino. The Mohenjodaro civilisation existed around 5,000 years ago and the fact that this animal was used as a seal indicates the

[*Courtesy* : Assam Forest Department]

significance it held in the popular imagination of that era. That the region then was green and fertile is also indicated by the rhino's presence. The rhino seal is now preserved in the Indian National Museum at New Delhi. Rhino bones have also been discovered at the Harappan excavation sites, this civilisation being almost contemporaneous with that of Mohenjo-daro.

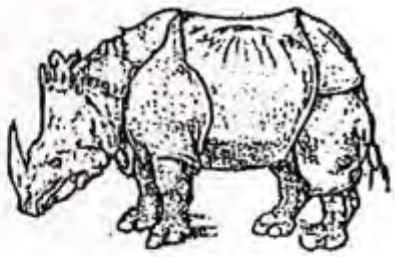
The Fifth Pillar Edict of Ashoka, the Great, in the 3rd century B.C. also mentions the Indian rhino. The emperor's edict enumerates the animals that were to be preserved, thus indicating that by then exploitation of animals by human beings had commenced. Among the fauna to be preserved are mentioned "bats, monkeys, rhinoceroses, tree squirrels, barasingha stags, brahminy bulls and all four-footed animals which were not utilised or eaten."

Historical references also reveal that in ancient times there were attempts to tame the rhino for various purposes, but with what degree of success is not known. Old kings of India were believed to have used rhino in warfare, with iron tridents fixed to the horn, which implies a certain degree of training. In Assam it was once used for ploughing fields, just as small elephants are used even today. Frank Finn mentions another somewhat unconventional use, no doubt apocryphal, to which the rhino was put, namely "as a pack animal to carry a rajah's ladies' attire to be washed"! Finn also states that "It could quite possibly be domesticated and used for ploughing. . . the old rulers of India used to put rhinoceroses into the battle field with iron tridents fastened to their horns, a use which implies some amount of discipline." P.D. Stracey of the Indian Forest Service, a conservationist of renown, also alludes to such uses in his *Wild Life in India, Its Conservation and Control*—"The animal was once domesticated and is supposed to have been used for battle and by the people of Assam for ploughing. This is not unbelievable as its reputation for ferocity is much exaggerated and even a full grown male rhino becomes docile within a fortnight after its capture."

It is not quite clear whether the existence of the Indian rhino was known to the ancient Western world. Some writers refer to the beast being used in the gladiatorial games in the Roman Circus by Pompei, but such animals could well have been the two-horned African variety. Yet the widespread myth of the Unicorn prevalent in the West makes it quite possible that ancient Europe knew at least of the existence of the Indian rhino. After the fall of the Roman empire, however, it was lost to memory so completely that till the end of the 15th century Western naturalists were of the opinion that if it existed at all, it had become extinct. Only after the Portuguese opened a sea route to India the existence of this animal was rediscovered and many of them sent to Europe.

One such historical animal was dispatched in 1513 by an Indian potentate to the king of Portugal, probably the first to set foot on European soil. Describing this Balakrishna Seshadri in his book, *The Twilight of India's Wildlife*, says: "It was a present from the King of

A historical rhino sent by King of Cambay to King of Portugal in 1513 A.D. as sketched by the noted German artist Dürer.



Cambay to King Emmanuel of Portugal, and was shipped from Goa to Lisbon. A fight was arranged in Lisbon between this rhino and an elephant, and the elephant, upon seeing the rhino, is said to have burst the arena and fled; King Emmanuel then decided to present the rhino to Pope Leo X. It was shipped again, but the ship was caught in a storm in the Gulf of Genoa and sank with all hands and the rhino. This was the animal immortalised by Albrecht Dürer in an engraving. Dürer never saw the rhino but did his work from a sketch by a Protuguese artist." Seshadri also refers to the first Indian rhino to enter England in 1684, which was paraded round the country for the next two years.

From ancient times the Indian rhino was a favourite 'game' for hunters who saw in its intimidating appearance and size vindication of their own prowess as hunters. As early as 1398 Timur Beg hunted the animal on the frontiers of Kashmir. In 1519 the Emperor Babur hunted rhino in Peshawar (now the N.W. Province of Pakistan) and on the banks of the Sorju (Ghagra) river in North India. In his memoirs Babur describes how he killed three rhinos near Peshawar while hunting with his son Humayun. In the book of Sidi Ali is mentioned the sighting of rhino near Kotal pass, west of Peshawar in 1554. Abul Fazal states that rhinoceros could be seen in Sambal Sarkar of Delhi during the reign of Akbar.

Even in the 19th century the Indian rhino was prolific in number although by then it had disappeared from much of Northern India. In the second half of that century the Indian rhino abounded in Coochbehar and the Maharaja there once recorded having killed 5 rhinos before lunch. Nepal too had a large rhino population and the hunt of the Unicornis was a particular favourite of its rulers. One Rana of Nepal is credited with having killed 97 rhinos in a month.

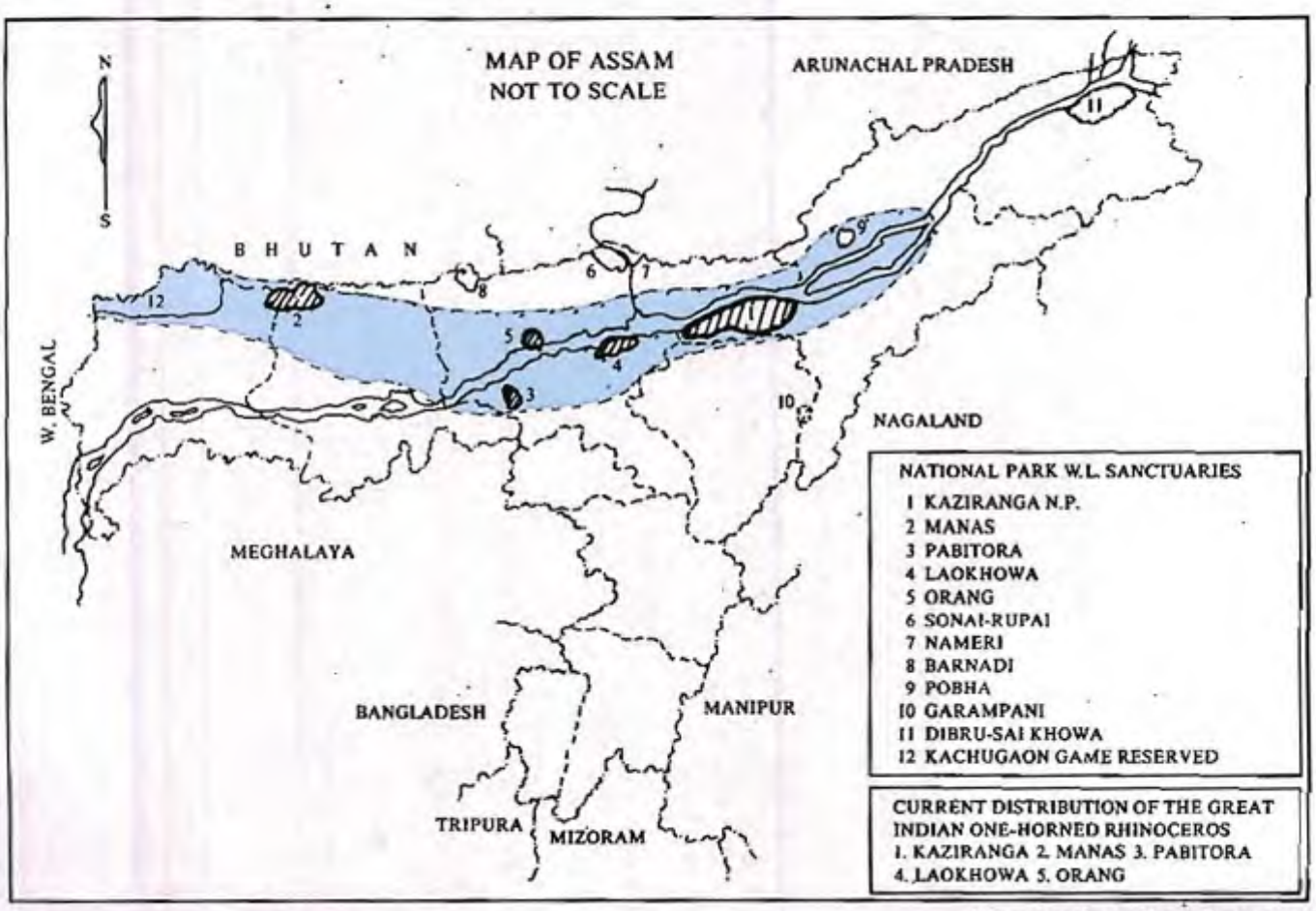
In Assam too the picture was no different. Medieval Ahom kings were addicted to hunting the rhino. When the plantations were established in Assam during the British period, European tea planters, armed with guns, slaughtered rhinos by the score. Old District Gazeteers of the later part of 19th century record how tea planters, on rhino killing sprees, would camp around the river Mora Difloo, and routinely shoot "2 or 3 rhinoceroses before breakfast."

The absence of any further historical references shows the gradual elimination of the Indian rhino from the Indo-Gangetic plains of the Indian subcontinent before the advent of the 18th century. Hunting apart, climatic, biotic and temperature changes, as well as growth of human settlements and cultivation were responsible for its disappearance. The fertile plains and grassy areas, ideal as rhino habitats, unfortunately were equally ideal for cultivation. So with an increase in population such areas were taken over by man, and the rhino habitat was irrevocably destroyed in these regions.

By the end of the 19th century its elimination from the Gangetic plains was almost total. The last rhino in Uttar Pradesh was slaughtered at the beginning of the 20th century. The Rajkamal hills of Bihar were

inhabited till 1850 and some residual numbers were present in that state even into the 20th century. But in 1960 the last rhino was killed in the Champaran district of Bihar. The last of the survivors in the Purnea district were eliminated when the Kosi river project was started.

In Bengal rhinos were present in Malda district till the latter part of the 19th century. In North Bengal and Coochbehar there were plenty of the animal left well into the 20th century. In fact such was their number at one point in the 19th century that shrinking habitat brought them into conflict with villagers, and the government, holding the animal responsible for damage to paddy crops, offered a reward of Rs 20 per animal for their destruction. But now, apart from a small area in Jaldapara on the foothills of Bhutan by the Teesta river, and the even smaller Garumara sanctuary, rhinos have disappeared from Bengal. Previously there were rhinos in the Kachugaon forest contiguous to Jaldapara also on the foothills of Himalayas through Buxar. The last rhino disappeared from that area in 1968. Even in Jaldapara refugees have settled over large tracts of grassland so that only a small part remains, and the rhino population there does not show an increasing trend.



[*Courtesy :* Assam Forest Department]

The Terai region of Nepal and Sikkim once teemed with rhino but due to organised killings, by the first half of the 20th century rhinos were not seen in Nepal except in a portion of Terai east of the Gandak river, less than 150 kms from Mount Everest and Annapurna. This is a sparsely populated jungle area, possessing the swampy habitat suitable for rhino, which explains why the animal survived there while being decimated elsewhere. Now called the Royal Chitawan National Park, the animals there are guarded by the Nepalese army. Despite strict vigilance poachers continue to operate, but the animal here has shown an increasing trend. In the '60s its number was around 200, in 1970s 300 and the population has grown to around 400 by now.

Today, the beleaguered Great Indian One-Horned Rhinoceros, which once roamed in great numbers throughout the Indo-Gangetic plains and the Brahmaputra valley, survives in a few places in Assam, West Bengal and Nepal. Their survival is precarious, and without armed protection, the remaining animals would have been slaughtered long ago. The present population break up is:

In Assam:

Kaziranga National Park	—	1,400
Orang Sanctuary	—	100
Manas Sanctuary	—	100
Pabitora Sanctuary	—	50-60
Sonai-Rupai	—	50
Deosur, Kukrakata, Panidehing, Kuruwa and other scattered places	—	100

In West Bengal:

Jaldapara Sanctuary	—	30
Garumara Sanctuary	—	9

In Nepal:

Chitawan National Park	—	400

During the disturbances that took place in Assam in 1983, the entire armed police pickets in Laokhowa and Burachapori were withdrawn, and unarmed forest staff fled from the interior camps. This resulted in opportunist criminal elements having a field day, and the entire rhino population of Laokhowa-Burachapori-Kochmara complex was massacred. Meanwhile Das, who had been away at that time in Africa on an U.N. sponsored study tour, returned and redeployed the available field staff. Carcasses of killed animals were located and counted, and it was discovered that the toll in the massacre numbered 47. But after restoration of normalcy, a renewed buildup of rhino population in Laokhowa commenced, and from recent sightings it has been established that around 10 rhinos are there. A few young ones had apparently survived the massacre and radial dispersal from Kaziranga also contributed to this. If proper protection is accorded, the population in Laokhowa area will attain the previous level in due course.

The figures of the Assam rhino population quoted above are subject to certain qualifications. In Kaziranga, for instance, the census of 1984 gave the following data of the total rhino population:

(1) By the method of visual whole count — 950 (undercount due to inclement weather)

(2) By the method of area sample count — 1,080 ± 17%

The 1990 census was conducted in March, but apparently it was taken under adverse weather conditions, and the results so far have not been divulged. However, in 1989 a sample census was taken, which placed the rhino population of Kaziranga at around 1,400.

Similarly, a census in 1985 put the rhino population of Orang at 64, and at Pabitora in 1987 at 56. Thus the 1990 figures for Orang and Pabitora quoted above are based on estimations and will have to await another census for verification. There have been no rhino census in Manas and the other areas; the figures quoted for them are estimations of forest personnel and subject to verification.

Panoramic view of Kaziranga National Park.

Individuals like Das believe that the latest figures for the rhino population in Assam are 'exaggerated' and not supported by census data. Basing himself upon available census data, Das feels that it would be more appropriate to quote the following for Assam rhino population:

Kaziranga	—	1000+	based on last census data
Orang	—	64	
Pabitora	—	56	
Manas	—	100	guesstimates
Sonai-Rupai	—	12	
Other areas	—	38	

In Assam, periodic census of animals (after every 6 years) has been conducted in Kaziranga only. The interval of 6 years is rather long, and Das and others have been advocating in various forums a census at shorter intervals, which will give more reliable data and ensure proper monitoring of population trends. Census of animals in other habitats of Assam must also be regularly conducted in order to give a clearer picture of the existing population trends in an area possessing the largest concentration of this endangered species.

Any history of the Unicornis would be incomplete without a brief mention of the history of the Kaziranga National Park, the true home of the animal and one of the conservation successes of the century. Assam till the 19th century was sparsely populated with vast virgin tracts filled with an astonishing variety of wild fauna. All the three Asiatic species of rhino were found in this region.

The discovery of the indigenous tea plant in Assam in the beginning of the 19th century sounded the death knell for its faunal wealth. Large areas of virgin jungles were cleared for setting up tea plantations and the wildlife habitat began to shrink. At the turn of the century the railway line into Assam was constructed, and hordes of migrant settlers and labourers colonised the Brahmaputra valley. European tea planters joined hands with local shikaris in decimating animals in large numbers. Records also show that large numbers of rhinos had to be killed when the North Trunk Road was built. Gradually wild life began to disappear from the valley. The Javan and Sumatran species of rhino were among the first casualties and the Indian rhino too was brought to the verge of extinction. In the beginning of this century the realisation suddenly dawned on the British authorities that less than a dozen of this species remained in the valley.

Debroy narrates a story which throws a new and interesting light on how the attempt to protect the rhino in Assam first began. An old Assamese villager, past 80 years of age, told him about this incident when he was in Kaziranga in 1969. Later Debroy verified it for himself. According to the story the actual credit for launching the rhino conservation campaign in Kaziranga should go to Lady Curzon, the wife of the then Viceroy of India.

Lady Curzon, it seems, had heard from her friends that a peculiar, one-horned animal with three toes on each foot lived in Assam. She may have also seen some specimen of this beast in the Barrackpore Zoo. She immediately associated it with the legendary Unicorn, and her curiosity drove her to Assam in the winter of 1904-5 to see the animal for herself.

Her party, which consisted of British officers as well as tea planter friends, camped at a spot in Kaziranga where the present P.W.D. Inspection Bungalow is located. For two days, on elephant back, they entered the swampy hinterland of Kaziranga, but failed to sight a rhino. Late in the second afternoon her mahout excitedly pointed out a rhino on the other side of a *beel*. But the lady was not convinced as she thought the animal was a wild buffalo. By the time they circumnavigated the large *beel* the rhino had disappeared. They, however, found hoof prints with three toes, which convinced Lady Curzon that such an animal did exist. She was unable to have any further sightings during the rest of her stay.

But the tales related to her while she was in Assam made her sure that the one-horned rhino had existed in large numbers once, though it was now greatly reduced as her failure to sight one indicated. On her return she persuaded her husband to do something to save this animal from total annihilation. Lord Curzon set the wheels of British bureaucracy rolling and on 1st June, 1905, a preliminary notification announcing the intention of the Government to declare 57,273.60 acres of Kaziranga as a reserved forest was issued. Finally, an area of 56,544 acres of land was declared as a reserved forest on 3rd January, 1908, and Kaziranga was officially closed for shooting. This must have been the sole ironic instance when the mythical Unicorn, perhaps indirectly responsible for the persecution of its namesake, came to the rescue of the Indian rhino.

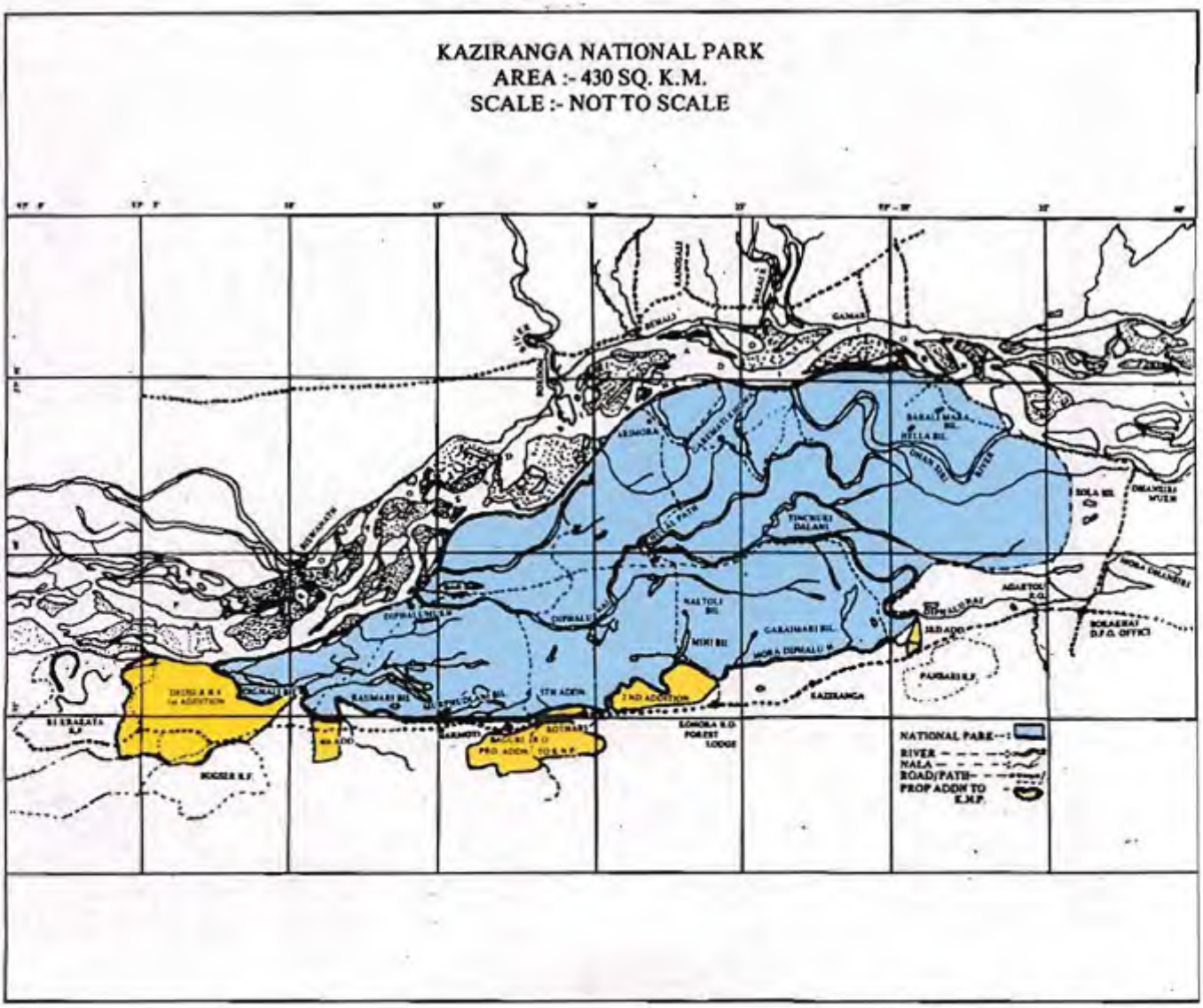
On 28th January, 1913, the area of reserved forest was expanded with the inclusion of another 13,506 acres. This was done in the teeth of opposition from the European planters, who objected vociferously that the area available for shooting game would be greatly reduced. But Major A. Playfair, the then Forest Settlement Officer, overruled the objections by pointing out that less than 20 pairs of rhino were left in the reserved forest at that time.

Kaziranga was declared a 'Game Sanctuary' on 10th November, 1916. In 1938 the then Conservator of Forests, A.J.W. Milroy, stopped all poaching and opened Kaziranga to visitors. Because the word 'game' connotated animals for hunting, in 1950, the then Senior Conservator of Forests, Mr. P.D. Stracey, changed the term to 'Wildlife Sanctuary'. Gradually the sanctuary, begun as a nucleus encompassing a small area, expanded to its present size. Finally, on 11th February, 1974, the designation was changed to 'Kaziranga National Park'.

In his book, *The Wildlife of India*, E.P. Gee, one of India's foremost conservationists, tells about his experience of Kaziranga in the 1930s, when the place was "a sort of terra incognita completely left to itself by the Forest Department":

"I have talked to the Forest Officer who was the first to be deputed to survey Kaziranga in the mid 1930s. He found poachers' camps at every *bheel* (small lake) and about forty carcasses of rhino with the horns removed. The Mikirs, the simple, peaceful but very interesting tribal folk who dwell in the Mikir Hills just on the southern boundary of the sanctuary, were among the many poachers. And when they ran away from the Forest Staff their "tails" (the ends of their embroidered loin-cloths) were caught hold of by the pursuers. The Mikirs would then draw out their sharp chopper knives and cut off their own 'tails' to facilitate their escape."

With hunting prohibited and protective measures strengthened, the number of rhinos in Kaziranga gradually increased. Many rhinos from this part migrated to other similar habitats, creating new pockets of rhino



[*Courtesy* : Assam Forest Department]

population at places such as Orang and Laokhowa. The rhino population at Kaziranga crossed the magical figure of 1,000 in the '80s. Today Kaziranga alone contains over half the surviving population of the Great Indian One-Horned Rhino in the entire world.

From less than a dozen to above a thousand — this indeed is a success story in a world of rapidly dwindling wildlife. This success has been made possible only through the dedication and sacrifice of the personnel of the Assam Forest Department. Rhino habitats in Assam such as Kaziranga and Manas have their unsung heroes—individuals who have given their all for the welfare of the animals, such as Mohi Miri, E.A. C. Forest, who died due to Blackwater fever, Gobinda Thakuria, who was killed in Kachugaon, Romesh Das, A.C.F., a dedicated conservationist responsible for setting up the Guwahati Zoo, Bhakharu Kachari, Heman Nath, Ramnidhi Choudhury and others.

A grazing Indian rhino

Obituary references of forest personnel killed on duty bear ample testimony to the sacrifices made by them. For example, the following obituaries under the title "They also sacrificed their lives" appeared in the July, 1985 issue of the *Assam Forest Bulletin:*

"Bolo Ram Das Fgd. and Karuna Kanta Kakaty Fgd. while on patrolling duty on the night of 28.10.84 at Balapara area were suddenly attacked and assaulted by miscreants and sustained fatal injuries. Bolo Ram Das died on way to hospital and Karuna Kanta Kakaty succumbed to the injuries at the hospital on the same day.

"On 27.2.85 Kulu Barpatragohain, Fgd. of Sonari Range, Sibsagar Division, while returning from duty was ambushed and shot dead in Abhayapur Reserve Forest by a group of Naga miscreants. . . . Moti Ram Barua, a Fgd. of Kaziranga National Park, had to face fatal shots of poachers who were hiding on a tree after attempted poaching of a rhino. This sad incident took place on 28.3.85. Moti Ram Barua met his end in the jeep while being rushed to the nearest hospital for medical treatment."

Fittingly enough, at the initiative of Neog, a memorial park has been established at Kaziranga to commemorate those individuals who have made supreme sacrifices to protect the animals of the wilds.

It is indeed fortunate that conservation consciousness vis-a-vis the Indian rhino came at the nick of time. But the same consciousness has not been shown in the case of the Javan and Sumatran rhino, and efforts to protect them in their native habitats are comparatively of recent origin. There has been no proper monitoring of these species and hardly any study on them. The kind of consciousness that the people in Assam, and the dedication that the Assam Forest Department have displayed, has not been shown by the people of those areas. That is why while the Indian rhino has literally been snatched from the jaws of annihilation, the population of the other two Asiatic species has not increased appreciably, and they continue to linger on the edge of oblivion.

CHAPTER III

UNICORNIS: GENERIC CHARACTERISTICS

PREVIOUSLY zoologists had classified all herbivorous mammals into a single group, the Ungulates (from Latin *ungulatus*), or hoofed animals. Later it was found more appropriate to divide the Ungulates into two natural orders—Artiodactyla, or even-toed ungulates and Perrisodactyla, or odd-toed ungulates.

The term 'Perrisodactyla' derives from the Greek *perissos* meaning odd, and *daktylos*, meaning finger. The order Perissodactyla therefore is a group of herbivorous mammals with one or three-hoofed toes in each hind foot.

The Perissodactyla were the dominant herbivore group in the Tertiary period, inhabiting Africa and the northern continents in vast numbers. But now the Artiodactyla has attained dominance. Today the Perissodactyla are a declining group represented by three families of living mammals: six species of horses (Equidae), four species of tapirs (Tapirdae), and five species of rhinoceroses (Rhinocerotidae). In all these animals the number of toes in the hind feet are odd; the third or middle toe is most prominent; it is always symmetrical by itself and always larger than the other toes when present. Horses have one toe in each foot, tapirs four in front but three in each hind foot and rhinos are tridactyl, having three toes in each foot, each tipped with broad, blunt nails.

All the five existing species of rhinoceros are grouped in a single family—Rhinocerotidae. They are massive, graviportal pachyderms (hoofed nonruminants), characterised by thick, solid bones and short, stumpy legs. The limbs are broad and massive and are padded with elastic connective tissues designed to bear their weight. The sheer size of the animals makes them free from natural predation except in the calf stage.

Though belonging to one family and possessing the broad characteristics of that family, the five existing species of rhinoceroses differ from each other in diverse ways. As a result of adaptation to different evironments, the extant species became distinct from each other at a very early stage in their evolutionary history.

Rhinos are tridactyl, having three toes in each foot, the third or middle toe being most prominent.

Among the five species the African White is the biggest, followed closely by the Indian, African Black and Javan, while the Sumatran is the smallest of the family. The African White stands at around 198 cm (6½ feet) at the shoulders and weighs upto 3.6 tons. The Indian rhino averages 170-180 cm (5 ft. 10 inch to 6 ft) at the shoulders with a girth of 335 cm (11 ft.) behind the withers and weighs around 2 tons. The African Black is slightly smaller than the Indian, weighing between 1.5-2 tons. The Javan one-horned is also smaller than its Indian counterpart. An old bull may reach 170 cm (5 ft. 10 inch) at the shoulders and weigh 1.5 to 1.8 tons. The average Sumatran bull may reach a height of 135 cm (4 ft.4½ inch) and weigh around .85 ton to 1 ton.

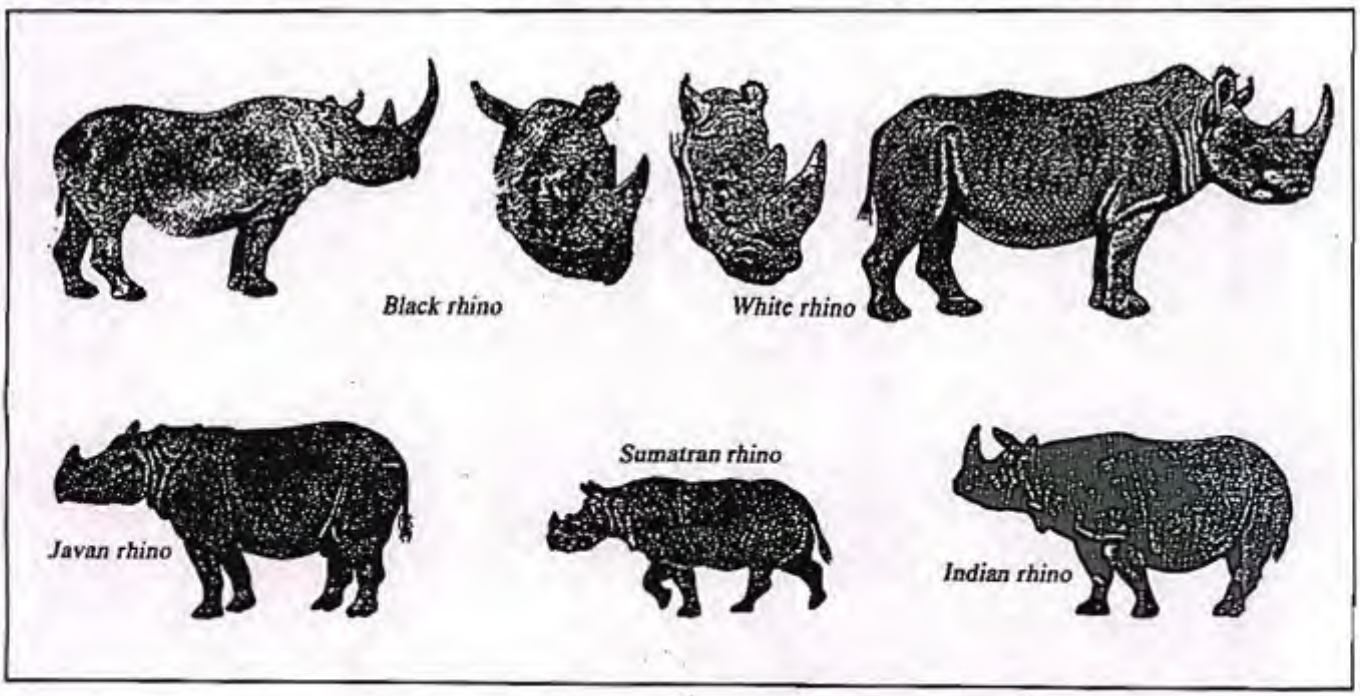
No thumb rule law to measure the length or height of a rhinoceros exists as in the case of an elephant, the height of which can be discerned from its footprints. I was told once that some experts claim to be able to calculate the length of an animal by tripling the distance from the tip of

the muzzle to the last of its three folds at the neck. But such a rule is meaningless because if this distance can be measured, the entire length too can be measured, which will be more accurate. In fact heights, weights etc. for animals are always mere approximations, and rarely tally in different accounts.

The word 'rhinoceros' is a combination of two Greek words *rhis*—nose and *Keros*—horn. Thus the word literally means a creature with horn on its nose. In fact nasal horn or horns is the most prominent characteristic in all the five species. The Great Indian and Javan sport one horn each, while the African White, Black and the Sumatran have two horns on their snouts. When there are two horns they are located one behind the other, the second horn standing on a protuberance of the bones between the eyes. In the African species the front horn is sharp pointed, curved slightly backward and averages 1.25 metres in length. A record specimen was measured at 1.52 metres. The hind horn is usually shorter and more conical.

The Great Indian rhino has a single horn of average 35-40 cm length. A record specimen exhibited in the British Museum had a length of almost 62 cm and a base circumference of almost the same. While in the Indian rhinos both male and female have horns of equal length, the male Javan rhino has short horn of about 25 cm but the female has no horn or, if present at all, only as a low boss. The longest horn recorded is 27.3 cm (10¾ inch). The first horn of the two-horned Sumatran is longer than the other Asian species though the second horn is short. The front horn can reach a length of 82 cm (32 inches).

As stated earlier, the socalled 'horn' of the rhino is not a horn at all. A



Comparative sketch of five species showing external generic differences.

typical horn consists of a core of bone, covered by a sheath of keratin (fibrous protein). The presence of a keratin sheath distinguishes horns from antlers which, when fully developed, consist entirely of bone. The horn of the rhino is not a true horn because it does not have a core of bone. Instead it is a compact mass of keratin fibres, not fixed to the skull in any way, but resting epidermally on a bony cushion. When a hard blow is delivered the horn can be dislodged and although there will be some bleeding, a new one will begin to grow in its place.

There are numerous instances of rhinos actually losing their horns and these being replaced. At the zoo in Guwahati a male was kept in an enclosure beside which another enclosure held a female in heat. The male grew so frantic with excitement that it dashed its head against the enclosure wall and was promptly dehorned. About a year later a new horn appeared in the place of the old one. In fact a proposal to dehorn all the Kaziranga rhinos to save them from poachers was contemplated once. But, fortunately, such an attempt at genetic engineering was not seriously pursued.

African rhinos not only use their horns as weapons of attack and defence, they also keep them well sharpened by rubbing them against trees etc. The Indian rhino has no use for its horn and is not observed sharpening it.

The process of evolutionary adaptation also brought about changes in the arrangement of the teeth of the Rhinocerotidae. The cutting teeth or incisors were reduced and canines almost disappeared. None of the five extant species have upper canines, but the Sumatran and Javan have a short lower canine on each side. All the species have three upper and

A rhino skull. The bony, nasal cushion on which the horn rests is prominent.

The posterior molars. The molars and premolars are complicated with folds and ridges of enamel to increase their efficiency as grinding organs.

An incisor and a premolar worn with usage.

Molars.

lower molar teeth. The African White and Sumatran have three premolars, and the rest have three or four premolars. The molars and premolars are complicated with folds and ridges of enamel to increase their efficiency as grinding organs. The tough cellulose walls of plants are difficult to crush and grind and as the teeth are worn by abrasion, their surface becomes rough and uneven. One typical characteristic of the Perissodactyla is that their molar and premolar teeth lie in one continuous series, the posterior molars resembling the premolars in shape and size.

Like all Perissodactyla which are non-ruminants, the stomach of the rhinoceros is simple and undivided and, compared to its body weight and size, smaller than that of ruminants. Herbivores require the assistance of bacteria, yeasts or protozoa in their digestive tracts to break down the indigestible plant cellulose into starches and sugars that can be absorbed. As time is required for the microorganisms to act, the digestive tract of herbivores is much longer than that of carnivores. In non-ruminants the intestine and colon are larger and longer, and the caecum, the pouch in which some bacterial digestion takes place, occupies a great part of the total length of intestines. There are many blind pockets in the intestinal system where food is macerated and fermented. The Perissodactyles do not have a gall bladder along with their liver.

Anatomical studies on the Indian rhino, however, show that though apparently it has the simple stomach of non-ruminants, it is not truly a simple stomach. A simple stomach has only a single chamber of mucous linings. In the case of the Indian rhino while the upper half of the stomach has a mucous membrane, the lower half has some villi like projections

Side view of rhino skull showing dentation as well as bony projection below the prehensile upper lip.

Incisor or cutting tooth, used with deadly effect by the animal.

like that present in the complex stomachs of ruminants. A fold bifurcates the mucous lining to separate the upper half of the stomach from the lower half having the villi like projections. The lower half does play a role in more efficient digestion and therefore the stomach cannot be called a truly simple stomach.

The skin of the rhinoceros is extremely thick and is a part of the animal's defensive mechanism. The colour of the skin in all rhinos is either grey or brown, including the White rhino, although it is somewhat paler than the others. The hair in four species is absent or sparse; the Great Indian has hair only on its ears and tail. The Sumatran rhinoceros is an exception, for at a young stage it has a dense coat of crisp hair, black or brown in colour. The ears and tails of this animal are particularly hairy. But as the animal grows older, much of the hair on its ears and hide are lost.

The lifespan of an animal is governed by the state of its teeth. This animal's cutting teeth and premolars had been worn away before it died.

Thick skin and hairless body are attributes of the Indian rhino. Note the tubercled appearance of the hide.

The Asiatic species of rhino are distinguishable from the African variety by the heavy folds in the skin, although in the Sumatran the skin folds are not very prominent. Apart from its single horn, the physical characteristic that distinguishes the Rhinoceros Unicornis from its brethren is that its skin is divided into great shields or sections by heavy folds before and behind the shoulders and in front of the thighs. These large, practically immovable plates are separated by joints of thinner skin to permit movement. Three folds around the neck form a kind of collar, the last of which is deepest and forms a conspicuous dewlap in front of the chest. The folds in front of the shoulders are not continued right across the back. The skin on the flanks, shoulders and hindquarters is studded with masses of tubercles that resemble steel rivets and give the animal a formidable, armour-clad appearance.

In the Javan rhino also heavy folds exist, but the folds of skin before the shoulders are carried right across the back of the animal, thus marking it out from the Indian rhino. The throat folds also do not hang below the anterior ones and are generally less heavy than the Indian rhino. Moreover, the hide is not tubercled, but tassellated in a curious, mosaic like pattern of small, polygonal discs.

Though the skin of the Indian rhino, like the others, is unusually thick, and seems to be impenetrable, in reality it is quite soft, and is easily cut by a knife or penetrated by bullets when the animal is alive. Zoo doctors tell me that they have no problem administering injections to ailing rhinos with ordinary hypodermic needles. But after a carcass is stripped and the skin dried, it becomes very tough and practically impenetrable. In ancient India shields made from rhino hide were used in battles; the army

Three folds around the neck form a collar. . . these are not continued right across the back.

The skin of the Rhinoceros unicornis is divided into great shields by heavy folds before and behind the shoulders and in front of the thighs.

of the Ahom kings of Assam as also many hill tribes used such shields. The Rengmas and other tribes of North East India believed that if they carried rhino hide shields in battle, they became practically invincible. The Rengmas had another quaint belief that a rhino, when sleeping in hilly areas, hooked its horn around a tree to prevent it from slipping! The Ahom rulers of Assam also made *samota* (leather thong or whip used for punishing offenders), which is one of the truly practical uses to which any organ of this animal has been put!

The prehensile upper lip of the rhinoceros performs the same functions as the flexible proboscis of elephants and tapirs, or the long, flexible tongues of giraffes and okapis—they help it in reaching food. All the rhinoceros species except the African White have a pointed upper lip that acts as a kind of finger to pluck leaves and twigs. The White rhino, with its square muzzle, feeds mainly on grass.

The brain of the rhinoceros is small compared to its body size, which perhaps explains why it is so slow witted and foolhardy! Except for the horn, the large face and head are pig like. The eyes too are small and set against the elongated, boat-shaped head, seem tinier than they really are. The rhino's vision is extremely poor, limited to a hundred metres or so. But its sense of hearing and smell are acute.

In the case of the Indian rhino at least, identifying a male and female in the wilderness from external appearances, is very difficult, for the genitalia is not visible, and the horns in both sexes grow to the same length. But experienced forest staff can distinguish males from females through tell-tale physical characteristics. This is required on certain occasions such as while taking a census of the animal. Their thumb rule is

Front and rear view

that the male is more stocky, its shoulder and neck portion thicker and bulkier. In females the skull is slightly thinner, the base of the horn is narrower and the horn is slimmer. However, for sub-adult rhino and calf such discrimination is impossible without physical examination.

Despite their bulk rhinoceroses are extraordinarily agile creatures —their slow, ponderous gait and lazy way of grazing is deceptive, as many a tame elephant has discovered the hard way. Their power of endurance too is phenomenal. A rhino can easily outstrip an elephant, can gallop, jump, twist and turn quickly, none of which an elephant can perform. As E.P. Gee points out, elephants, contrary to popular belief, cannot run, but can only shuffle along at a fast walk of about 32 km per hour speed, and cannot jump a ditch more than two metres wide, which is the maximum length of their stride. The Indian rhino can not only stop quickly and swerve sideways while on the run, and jump over ditches, it can also attain a speed of 48-50 km per hour when in full flow. The African Black can attain a speed of around 45 km per hour even in thick cover and can wheel rapidly after missing a charge. It is this agility combined with strength that makes them such dangerous adversaries that even elephants and tigers are afraid of them.

Due to the strength in their limbs they can enter muddy patches where other animals dare not tread. They do get stuck sometimes, of course, and have to be bailed out by forest staff. The rhino is also the only animal that swims across rivers in a straight path from one bank to the other, no matter how big the river and how strong the currents. Most animals prefer to take advantage of downstream currents and chart a diagonal course. Forest personnel confirm sighting occasional rhino crossings across the mighty Brahmaputra river, their powerful limbs making a sound somewhat akin to that made by paddle steamers of yore.

The lifespan of the rhinoceros has not been scientifically measured nor are there records that might help one to arrive at a definite conclusion. Four different sources consulted by me gave the lifespan as 60, 40, 70 and 50 years. Frank Finn, while believing that a rhino dies at the ripe old age of 100, qualifies his statement with "—at any rate it has lived for half that time in captivity, more than once. A pair lived forty five years in the Barrackpore Park, and Blanford cites fifty or sixty years."

A study based on the natural deaths of rhino in captivity recorded at the Guwahati zoo, which has the largest number of captive Indian rhinos in the world, places the average lifespan at 50 years. The longest living specimen here lasted for 57 years 11 months, and the next for 51 years. But the lifespan of animals in captivity is not a true indicator for animals living in the wilderness, and the number of recorded natural deaths in this zoo is too few for a definite conclusion to be arrived at. But from circumstantial evidence it can be surmised that the Indian rhino's lifespan is between 50-60 years.

Like its cousins elsewhere, the Indian rhinoceros, one of the oldest land mammals, has retained its original characteristics for millions of years.

As such, its interest to natural history is great. That it has not only survived the ruthless evolutionary process, but also the equally ruthless predation by man, is a miracle in itself. Now it is the turn of mankind to do its bit to help perpetuate this miracle by ensuring that this magnificent animal is saved from total extinction.