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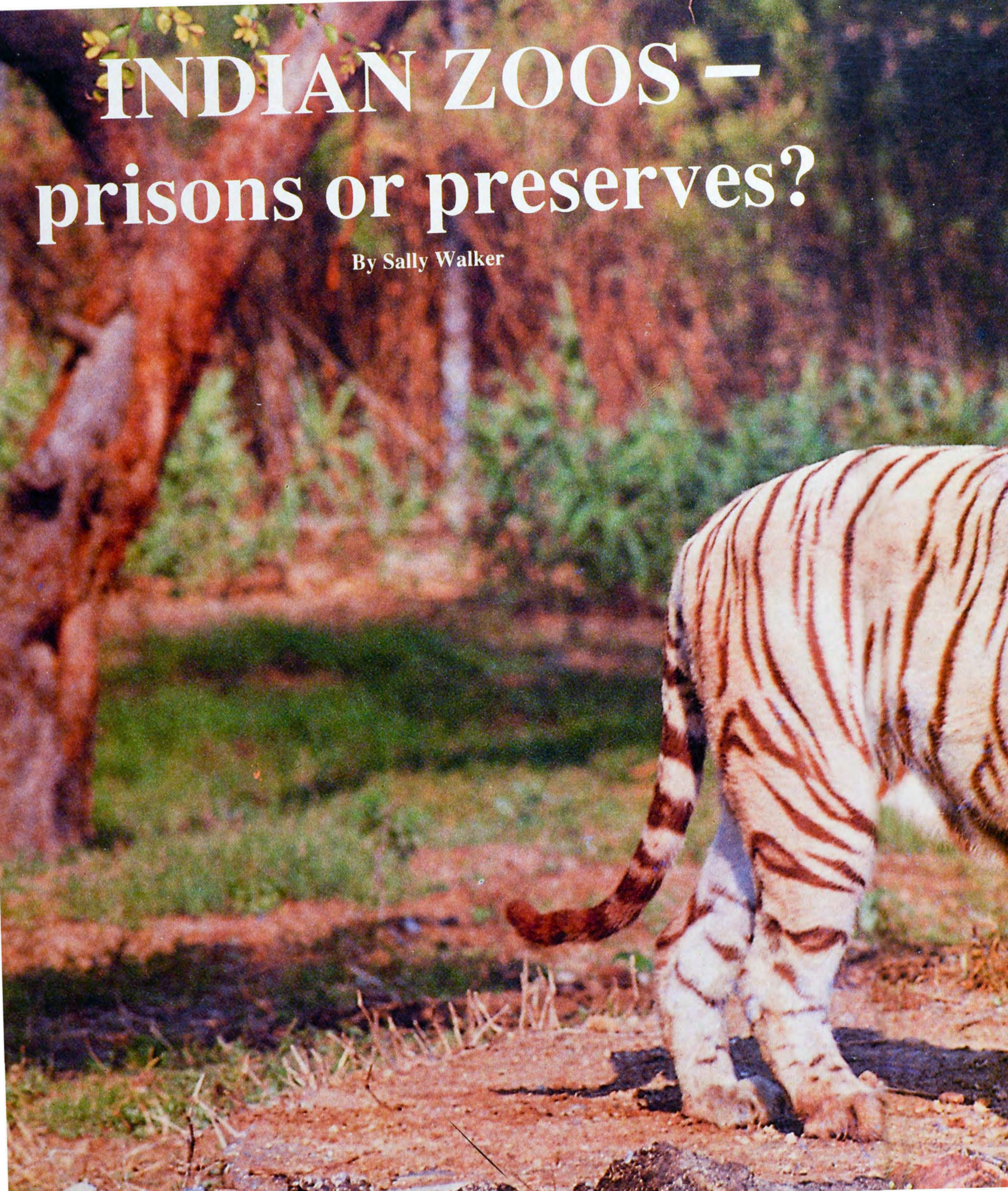
INDIAN ZOOS – prisons or preserves?

By Sally Walker



There is no denying that most zoos in India are, both, popular and disgracefully run. The few that shine out as examples of good conservation are the exception and so far there seems no indication that better zoos are on the horizon. Little wonder then that most conservationists see red when the subject of zoos comes up. They would prefer that all wild animals be allowed to roam as free as on the day they were born. Unfortunately, as India's lopsided development projects continue to consume habitat after habitat, almost all our wild animals face a bleak future. ***Sally Walker****, a noted authority on zoos, therefore makes a case for 'good zoos' where captive breeding and conservation objectives can go hand in hand with entertainment. With pragmatic management and clear-cut policies, she suggests, even existing zoos could be turned into model conservation centres.*

Since the dawn of civilisation humans have captured and displayed wild animals as oddities meant primarily for the entertainment of society. It is only very recently that the voice of the animal rights movement has begun to be heard. The thought has finally percolated through society that putting on such freak shows actually underscores our own baser nature.

Nevertheless, even today the throngs that flock to zoos do use the surrounds to escape the trials and tribulations of urban life, occasionally even managing to touch base with nature through renewed bonds with creatures with whom our ancestors once shared the earth.

The role of zoos

The role of zoos is fast coming to be recognised as a vital input to conservation efforts. In November of 1989, a symposium on mammallian re-introductions was sponsored by the Zoological Society of London entitled "Beyond Captive Breeding: Re-Introducing Endangered Species to the Wild." In his presentation, Simon Stuart, Species Programme Officer of the Species Survival Commission of IUCN. commented that in the 14th published Action Plans of the Commission Specialist Groups, there were 68 projects suggested in which a significant part of the methodology was captive breeding, while 24 involved reintroduction.

The World Conservation Strategy, written a decade ago and presently undergoing revision, recognised zoo or controlled breeding of wild animals as well as domestic livestock as a major method of maintaining genetic diversity and saving endangered species. Ten years later, with the self-inflicted war against our planet undiminished, contrived methodologies may assume even greater significance.

In India the Wildlife Action Plan encompasses captive breeding, as well as zoos as centres of conservation education. Recently, at an International Symposium on the Role of Zoos in Wildlife Management held in Junagadh on the occasion of the 125th anniversary of the Sakkarbaug Zoo, it was pointed out that unless alternative habitat could be provided and the small population of lions presently inhabiting Gir spread out, future zoo lions might provide more genetic diversity than wild ones! Resolutions unanimously passed at the Symposium by zoo personnel and conservation biologists asked for urgent action to prevent such a tragedy. And if it could not be prevented it was felt that it should at least be provided for.

Also in November 1989, at a Symposium entitled Conservation and Sustainable Management of India's Genetic Estate, Mr. Pushp Kumar, Principle CCF, Andhra Pradesh Forest Department, also pointed out that efforts to save endangered species in the wild had to be supplemented by various methods of controlled breeding.

Captive breeding

In October 1988 the Fifth World Symposium on Breeding Endangered Species in Captivity, held in Cincinnati, heard many success and near-success stories in captive breeding and reintroduction. Zoos, breeding centres and private breeders have cooperated the world over to produce captive populations of species whose numbers in the wild had diminished to the point-of-no-return, without active intervention. From the pink pigeon and the red wolf to the golden lion Tamarin, coordinated breeding programmes have begun to make the most strategic use of the least number of captive individuals in a species by computerising their genetic profile and subtly manipulating subsequent pairings. India was also represented with its own success stories at this conference for work on the Malabar giant squirrels, muggers and turtles.

Although the need to save habitats in order to save species is clearly supreme, there are too many pressures on existing small populations for us not to step in now. The political, economic, social and ecological factors in favour of habitat salvation are too few and too weak in many countries, and some species too far gone to justify doing 'nothing'. Clearly, breeding wildlife under controlled conditions has emerged as a major tool for conservation. Controlled or captive breeding is being

done by a variety of institutions and individuals: zoological gardens, research stations, commercial breeding centres and individuals keeping pets. The most ''successful'' of the alternatives for conservation are zoos -- for several reasons:

1. A zoo, being essentially a ''public'' institution, is practically the only organization which is able to generate sufficient funds and acquire sufficient land for itself to carry out effective captive breeding conservation programmes.

2. While private individuals with enormous wealth and land have certainly contributed to conservation of some species, there are too few of them to satisfy all the needs of all the species to be saved. Besides it is difficult to organise and control private and solely commercial enterprises. Moreover, it is an unsavoury fact that many private efforts, successful though they may be on one level, have had their own agenda which may not have been in the best interests of the species. Indeed, not all zoos, public or otherwise, are fully focussed on conservation and high ideals, but being public or at least in the public eye, they can be controlled more easily.

3. Successful conservation efforts today must necessarily include an education component, which is only possible if the institution is open to the public.

Cooperation and coordination

Established zoos around the world have now woken up to the fact that their own survival as institutions as well as the survival of many endangered species depends entirely on the degree to which they cooperate and coordinate their breeding and research (and even education) programmes with each other -- sharing progeny, space, ideas and expertise.

In many countries national level zoo associations have emerged as effective self-governors of strict ethics and standards pertaining to animal trade and care, wielding the powerful sword of peer pressure. It is the opinion of this writer, after studying more than 150 zoos on four continents, that it may be taken as a rule: the efficacy of peer pressure in a zoo association is the strongest indicator of maintenance of standard quality and morals in administering zoological institutions. Legal strictures may be there in abundance, but peer pressure (which includes withdrawal of recognition, cooperation and coordination) gets the job done. Zoos can't survive -- and maintain quality -- without one another.

"Unless alternative habitat can be provided and the small population of lions presently inhabiting Gir spread out, future zoo lions might provide more genetic diversity than wild ones! "

Indian zoos -- the way they were

The first Indian zoos, or collections of wildlife kept alive in captivity for viewing pleasure, were private collections of rajas and zamindars. The first public zoo was opened by a private noble family in Calcutta in 1854, beating the municipality of Madras to the honour of being first by a year. The Marble Palace Zoo and Aviary was opened for the amusement and edification of the public by the Mullick family who were philanthropists. This zoo is still operating today, but has fallen on hard times.

Over half a dozen zoos were opened to the public by Maharajas or various government bodies in the next quarter century -- Madras, Calcutta, Trivandrum, Trichur, Junagadh, Jaipur, Mysore. It is clear that conservation ideals were not prominent in motivating the founding of these institutions, but it is equally clear that the motives were not entirely frivolous. For example, exactly 100 years ago on April 2, 1890, in the Resolution of the Government of Bengal, on the Report of the Managing Committee of the Calcutta Zoo, it was suggested that a handbook be produced from the 13 years of recorded experience of caring for animals in captivity ''which would be of interest to the scientific world and to persons interested in zoology'' as well as ''of practical use to the managing bodies of other zoos and individuals who have private collections.'' The Resolution also states clearly that ''it is incumbent on all persons who keep animals in captivity to avoid anything like cruelty in their treatment.''

The suggested handbook was written -- by an Indian incidentally -- and published in 1892. A Handbook of the Management of Animals in Captivity in Lower Bental, by Ram Bramha Sanyal, is a 400 page volume elucidating the care, feeding, breeding, transport and medical treatment of 241 species of mammals and 402 species of birds. It is unquestionably the first zoo management book to be published in the world, and the first scientific effort (including those whimsical books which came out of the London Zoological Society!) for several more decades!

This Handbook and the methods taught therein, although very much outdated, nevertheless still could be used to improve probably 90 per cent of the zoos in India today and even some aspects of zoo management in other countries. One example of Sanyal at his best is when he states of polar bears: "A polar bear is one of those animals which should never be acquired for exhibition in this climate."

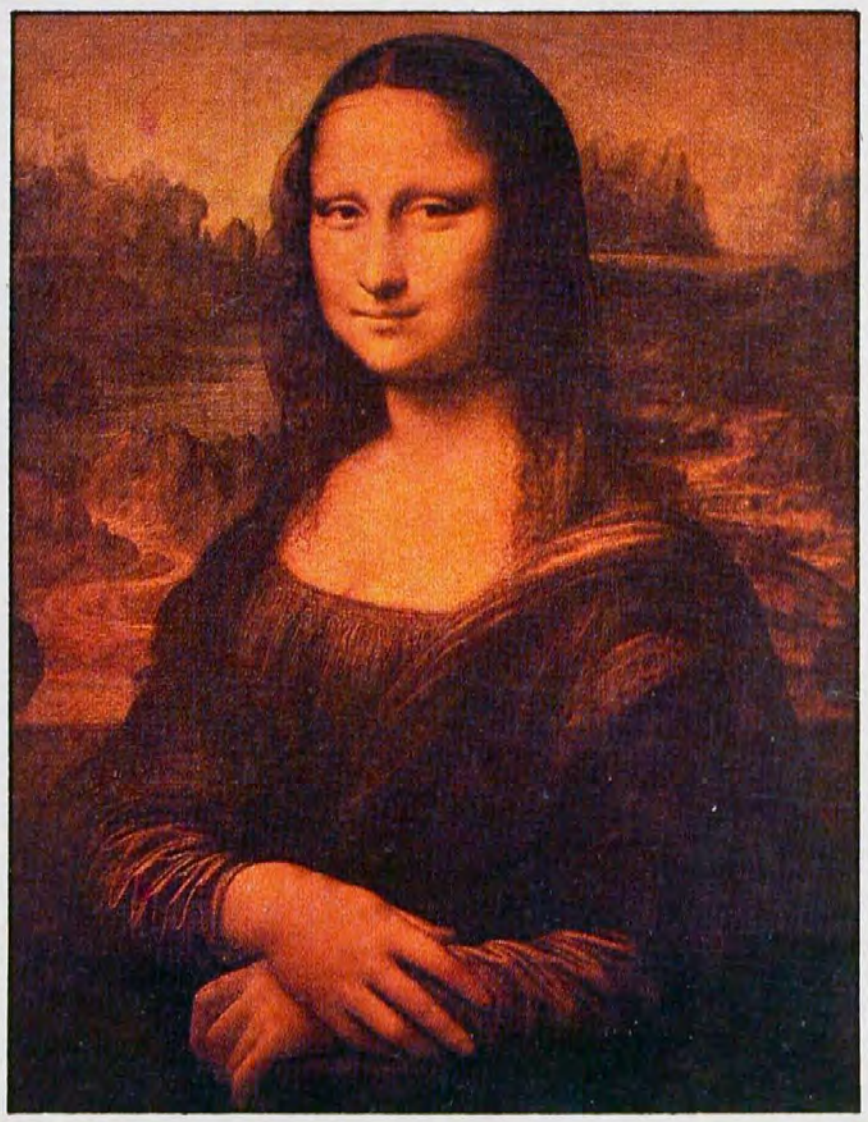
Furthermore, some of these zoos such as Jaipur, Jodhpur and Sakkarbaug boasted open moated enclosures for big cats before Hagenbeck (the famous German zooman credited with inventing the modern zoo) was born! It is interesting to examine the holding cages for big cats in these enclosures; they are large, designed to stay cool in summer and warm in winter, and contain built-in furniture, unlike the shoeboxes modern zoos often keep their tigers and lions in today, when they are not in their "open" enclosure. At this time in history Indian zoos were probably on par or even ahead of those in the rest of the world. (NOT due to the efforts of the British as some like to claim!)

What happened?

After Sanyal's book the next significant event in the history of Indian zoos took place in 1955, when the Madras Zoo celebrated its centenary with the first All-India Zoo Superintendents' Meeting. The proceedings were impressive and involved sophisticated topics such as inbreeding, insect zoos and conservation education.

By this time, however, judging by the topics discussed at this meeting, Indian zoos had fallen behind the rest of the world in various areas of scientific management. Considering the fact of Independence and the growing pains of an infant democracy, this is certainly

Mona Lisa — the masterpiece that was destined to be imitated.



understandable and forgiveable. What is not so easy to comprehend (or forgive) however, is the fact that a number of the subjects and problems, discussed at this meeting of Zoo Superintendents thirty-five years ago, were still unresolved at the Sixth All-India Zoo Directors meeting held at Sakkarbaug Zoo just months ago!

The management of zoos

In the early days of the IBWL, luminaries in the field of wildlife conservation, such as K.S. Dharmakumarsinhji, were convinced of the potential of zoos in conservation and the importance of scientific management. There was even a Zoo Wing of the IBWL which met separately and their resolutions were taken quite seriously. Admittedly existing zoos did not improve much as a result, but on the face of it new zoos begun by the Central Government and State Forest Departments were very good indeed.

By 1972 it was acknowledged that the subject of zoos needed to be addressed seriously. An Expert Committee was therefore formed to tour the zoos, assess the potential and problems, and bring out a Report which would not only serve as a status statement but also as a guide, or handbook for zoo managers. This Report, entitled, "The Management of Zoos in India: Report of the Expert Committee for Zoos," is excellent. Even today, two decades later, if all the zoos in India were in a position to follow the guidelines laid down in this Report, they could compete with practically any zoo in the world. If the concerned Ministry had implemented the more important recommendations of the Committee at that time, the zoo story in India today would read very well indeed. But they didn't.

Fortunately, today the formulation of an official Zoo Policy for India, the setting up of a separate Zoo Authority and the formation of an Indian Zoo Director's Association are in the very final stages of being implemented. After a decade of no action at all, wheels began turning in 1982 which ultimately resulted in concrete proposals about three years ago. Since then, a refining process has taken place which had the effect of improving the supporting documentation for these all-important milestones. Since then, however, a new government has taken over and it remains to be seen whether

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those responsible will push forward the result of years of work by many competent and knowledgeable people, or whether matters will only be further delayed.

If, however, the captive breeding effort is to be of use in conservation of wildlife in India, the instruments described above -- as they are presently formulated or with very minor changes -- absolutely must be implemented with immediate effect.

Today's zoo situation

On paper there is no dearth of laudable pronouncements about zoos: the Wildlife (Protection) Act 1972 exempts zoos from most of its strictures (which is about to change in the amendments now on the anvil) and the Wildlife Action Plan includes a section on zoos and captive breeding. There was a centrally sponsored scheme for selected zoos which gave matching funds in lakhs to zoos which proposed good breeding and education projects. The National Zoological Park was named as coordinator of all zoos and given additional funding to produce a magazine and conduct various activities for all zoos.

In the last quarter century, several very well-planned and well-funded zoos have been constructed. The National Zoological Park in New Delhi, the Nehru Zoological Park in Hyderabad, Allen Forest Zoo in Kanpur, Nandankanan Zoo in Bhubaneshwar, Indira Gandhi Zoo in Visakhapatnam, Aregnar Anna Zoo in Madras, the Van Vihar National Park Zoo in Bhopal and M.C. Zoological Park Chandigarh. These Indian zoos would give any of the world's zoos a run for their money in terms of size, layout, (to some extent) construction, topography, and (without a doubt) potential. No less a luminary than William Conway, President of the prestigious New York Zoological Society ranked Nehru Zoo with the top ten in the world some years ago and now there are other Indian zoos which are as good.

Even in these beautiful, spacious, modern zoos, however, scientific management falls below international standards. There is, comparatively speaking, a low birth rate and a high death rate even in some of the best of these zoos. Only a handful of the hundreds of endangered species of Indian wildlife have bred beyond the second generation. Those which have done, have not been well managed, so that there is much inbreeding. Truly important species are not given their due importance in favour of spectacular freaks or mutants such as white tigers, black panthers and albino porcupines. Valuable space, finance and attention goes into such animals when lesser cats, civets, ratels, and so many other ''low profile'' creatures are consigned to substandard conditions.

I might hasten to add that there are many exceptions to the above statements. I have made very general observations to make a point. Definitely individual zoo personnel and individual zoos have excelled with a few species; but these are exceptions that prove the rule and do not reflect the overall situation which requires immediate, positive attention.

Further, ''controlled breeding'' really does mean CONTROLLED. It means that zoos should not breed more than what they can exhibit, exchange or dispose properly. Even the better zoos, when confronted with a surplus of tigers or lions, would probably breathe a sigh of relief and despatch them to any small shabby zoo which will take them off their hands. This is called ''death at a distance'', meaning one doesn't have to see the results of one's carelessness. If the bigger and more responsible zoos lack this sense of ethics, how can they set an example to the smaller zoos?

Cooperation and coordination between Indian zoos is a desirable objective which is yet to be truly fulfilled. Again, some of the components of cooperation and coordination are there and certainly there is a sincere desire on the part of most of the zoo managers to do so, but they are constrained by their own uninformed and perhaps disinterested superior officers in often entirely unrelated fields.

Central coordinating required

These are only a few aspects of scientific management and we relate them not with the intention of being critical for the sake of criticism, but for highlighting the effect of years of neglect of zoos by the concerned official establishment. One is forced to use the term ''concerned official establishment'' because it has changed so many times over the last quarter century. The zoo subject has been the purvue of the Forest and Wildlife establishment, which itself has been administratively shuffling around and may even do some more shuffling before all is said and done.

And this is one of the major problems with the Indian zoo community: the fact that Indian zoos are run by so many different administrative bodies, that it has been impossible to unite and develop as a community with a common moral and ethical position.

Similarly, with the trend of the last 25 years being that the new

big zoos have been constructed by the Forest Department in the various states, the system of transferring officials has destroyed the possibility of developing a cadre of zoo professionals. If there are no zoo professionals, there is certainly no hope of evolving a professional zoo-community. Such a community is absolutely essential to good, ethical, scientific zoo management, without which peer pressure, the greatest deterrent to wrong-doing and the greatest adjunct to cooperation, is impossible.

Probably nothing has done more damage to the development and progress of scientific management of zoos than the system of deputation and transfer of directors and veterinary doctors. Continuity is impossible when personnel are transferred every one to five years and replaced, not with another zoo manager or vet, but with someone who has to learn the subject from scratch. Systematic captive breeding programmes have to be long-range affairs in order to succeed; we are talking about programmes which cover several generations of species, which cannot be rushed like the construction of a rest-house.

If the middle and lower-level staff were trained, educated and caring such as is in the case in western countries, the transfer system would not be so destructive. These people are extremely important to good zoo management and could easily provide continuity even under an uninitiated director. There is no doubt, however, that Forest Officers are superb administrators and could tend to such matters, leaving the technical staff free to look after the animals. But this is not what normally happens. Middle level staff are often no more than clerks or the usually illiterate lower level staff. The keepers, so critical to the success of zoos, have had to accept the lowest status job in India. When one considers that middle level staff in Western zoos are often Ph.D.s and even most zoo keepers are college graduates and post-graduates, the plight of Indian zoos and their inmates begins to come into focus.

Many of the problems enunciated above could be mitigated and finally solved by bringing all the zoos under one separate central coordinating body -- the Zoo Authority of India. The National Zoo Policy which is currently awaiting approval by the Government of India provides for such a body.

The Zoo Authority of India

An excellent, detailed proposal for the establishment of such an Authority has been drawn up and approved at the recent All-India meeting of Zoo Directors. Under a Zoo Authority it may be possible for a young officer interested in captive breeding to opt for "zoo service" and remain in the field for the duration of his career. He could then undergo extensive training which would be an investment -- instead of a risk as is the case today!

Several Indians have taken the superb training course at the Jersey Wildlife Preservation Trust Training Centre and returned to their zoos either to be transferred to social forestry or refused permission to implement the new techniques by a jealous superior. Others who were not in any service have taken the training, thinking it would enable them to work in Indian zoos, only to find the field which desperately needs them is closed to them! Such anomalies abound in the Indian zoo establishment.

A zoo service could and should also include specialised zoo veterinary doctors, zoo architects, zoo engineers, zoo animal care technicians and zoo educationists as well as conservation biologists and zoologists. The lack of trained and experienced personnel in all of these fields is very much responsible for the low birth rates and high death rates in our zoos as mentioned earlier. No zoo director, no matter how enthusiastic or effective, can do all these jobs. In spite of all the problems they face, the fact that Indian zoos are stil as good as they are indicates clearly that the precedent set by Sanyal could once again allow Indian zoo personnel to lead the world in this field, if they are properly encouraged.

A centrally administered Zoo Authority could coordinate the import of much needed drugs and equipment for zoo management, implement zoo training programmes for all levels of zoo personnel, confront problems with other agencies responsible for transport of zoo animals and a variety of other subtle and vital activities.

The Need for a National Captive Breeding Strategy

Perhaps the most urgent need, from a long-range conservation standpoint, is for us to take a hard look at the *national* captive breeding and holding capacity of our zoos. A strategy for breeding and conserving the most vulnerable of our fauna is imperative in the face of the threat to habitats which we see all around us.

But this is not as simple as some lay persons may think. William Conway once performed a most interesting and useful exercise with information drawn from the International Zoo Year book (IZY) about zoos and the Red Data Book of species. He added up all the available space in zoos, allocating the bare minimum space for a viable population of endangered animals and concluded that *there was not enough space in the world's zoos to maintain and breed the major and most taxonomically unique wildlife under threat.* This is why some western zoo persons turn apoplectic when we in India talk of breeding white tigers and black panthers in our limited zoo space! Conway's exercise should be done here along with an overview of what species of Indian wildlife need salvaging.

If this were done, it may be found that we desperately require all of the nearly 150 wild animal viewing facilities which presently exist in India, purely from a spatial point of view. When one considers that the wild population of Gir lions is in-bred, some idea of minimum viable zoo populations for last ditch salvation efforts is self-evident.

There has been, is, and will be loud talk of closing down many small, shabby, inhumane zoos which exist for no good reason in India today. When it comes to actually closing them down, however, there is more talk than action. The fact of the matter is this: it is nearly impossible to close down an existing zoo under the present laws and in the absence of an official zoo policy. Particularly if it is run by any government agency, such as a municipality -- no matter how small or shabby. For example, a zoo in one of the southern states has been notified for closure for quite some time. Among its many sins of commission and omission is the sale of surplus Axis deer to a butcher. The Municipal Corporation which runs this zoo is able to keep the wildlife department wolves at bay by appealling for extensions of time and making assurances of great improvements. Improving a one acre zoo is possible but improbable in the present context, yet the Municipality can keep this game going for years.

Most cities and towns which have poorly maintained zoos do not want to invest more time and money in improving them, but they also don't want to close them. ''What about the people,'' they say, and it is a fact ''the people'' of a town protest vigorously when their zoo is threatened, although they may never visit it! Municipal or district authorities do not want to offend ''the people'' and who in this world wants to offend a Commissioner or Collector! Certainly not a wildlife warden; not even a Chief Wildlife Warden.

The way out of this is forward. If these facilities can't or (for reasons of zoo space requirements) shouldn't be closed, then they can be renovated. Again if there is a central authority for zoos, much can be done even for these small zoos. Some excellent zoos in the west cover no more than two or three acres. Small species and less of them in expertly designed enclosures can satisfy every requirement of a modern zoo if care is taken. But care - spelled CARE - has to be taken.

Wild, or captive-born animals in zoos?

In an article published in early 1990 in a major weekly magazine, someone who should know better stated that ''all the animals (in zoos) are taken from the wild.'' This is simply not true. Although Indian zoos are not breeding some of the more delicate and rare species, they are definitely holding their own with many popular and attractive animals which are standard for most zoos: tigers, lions, panthers, deer, antelope, primates (even rare ones such as lion-tailed macaques, etc). And even though cooperation is limited compared to western zoos, exchange of animals does go on so that most zoos can fill their enclosures with captive-born wildlife.

The animal baggers, unscrupulous dealers from Patna, Calcutta, Lucknow, etc. still ply their trade to some extent but most of them have had their licenses withdrawn and have had to go completely underground. Most zoos, even those which do not mind dealing with them, have stopped entertaining them due to fear of punishment. In this aspect, the efforts of the Central Wildlife Department and their Regional Wildlife Wardens are exorably closing every loophole. What abuses still exist are shameful in the extreme: red pandas, a marble cat, many slow

loris and other rare primates and birds are just a few of those the writer has viewed, sometimes "off exhibit" in not-so-scrupulous zoos.

Getting animals for zoos

Ironically, however, the number of wild animals coming into irresponsible zoos through dealers is minor compared to what comes in to legitimate and supposedly responsible zoos through the "old boy network" of the Forest Department. In some states, Department zoos are able to obtain nearly anything they want. So much is legitimately confiscated or trapped as nuisance animals that the occasional extra-legal capture can be absorbed easily.

Department officials who do this justify their action by claiming the Wildlife Act is too strict, that zoos need occasional stock from the wild. They are right too. If captive breeding is to be a viable conservation tool, viable breeding groups have to be kept. Some Schedule I animals are not actually so rare that capture of a pair for scientific breeding or upgrading a depleted gene pool is anti-conservation. On the other hand some Schedule I animals, are so very rare and live in such disturbed habitats that their only chance may well be capture for captive breeding and later reintroduction.

The wilds should not be depleted of wildlife for zoos but if captive breeding is acknowledged as part of a nation's conservation strategy, some capture from the wild is justified and necessary. To be fair, the wildlife establishment has been unduly strict in the last few years to cope up with widespread abuses. There is reason to believe that when zoos develop a more coordinated and systematic breeding strategy, the central wildlife authorities will follow suit with the necessary permissions.

Another reason by which wild animals come into zoos is becoming more and more common: man and animal in conflict. The habitat has shrunk so alarmingly and population has grown so rapidly that, combined with the highly successful conservation measures instituted by Project Tiger, wildlife is more and more in search of new territory. When that infringes on a voter's precinct, the animal is nearly always the loser: he gets a life sentence in a zoo. This is happening so often now that it is a problem for many zoos to house these animals and certainly to "adjust" them to their captive cousins.

Irony abounds: a thousand acre zoo with a fifty-five acre tiger enclosure is forced to keep some wild tigers and panthers which were captured as trouble-makers in small cramped cages. The budget doesn't include a fund for spacious enclosures for animals which can't be exhibited. These wild animals can't or won't adjust to the zoo routine of returning to the inner den every night which safety and security demands. The Director is not happy about this but he has no alternative. Perhaps, we need, as the writer's Chief Wildlife Warden suggested, a Pinjerpole for wildlife!

What to do with these animals? And if all the small shabby zoos are closed, what to do with all their animals? The larger and more scientifically oriented zoos have their breeding agenda well-planned. If they have to make space for such animals, it may prevent their carrying out breeding programmes for very rare animals! The animals from such zoos also may carry diseases, having not had the advantages of good sanitation and veterinary care.

Reintroduction: fact or fantasy?

The zoo community the world over today gets much mileage from the promise of "breeding endangered wildlife for return to the wild". How much of a reality is this actually and how much of it is being done by Indian zoos.

In fact, much is being done in the area of reintroduction but it is still in the very early stages. Too soon to tell how workable it may be, and certainly some species are easier to return than others.

One fact is very clear however and that is that *successful reintroduction requires suitable habitat.* Many conservationists criticise pro-

"A strategy for breeding and conserving the most vulnerable of our fauna is imperative in the face of the threat to habitats which we see all around us."

ponents of zoos claiming that promoting zoos as havens for displaced wildlife and emphasizing captive breeding for reintroduction creates a sort of complacency, a false sense of security about rare wildlife, which may work against the more important preservation of habitat. They have a point and a good one too.

Reintroduction efforts in India by the zoos and breeding or rearing centres which have attempted them have been highly successful for some species of reptiles and ungulates, and notably disastrous for large carnivores.

Reintroduction attempts for certain species of ungulates, such as the Manipur brow-antlered deer, made by wildlife officials NOT in consultation with a zoo-man have also ended tragically. Wild animals born in captivity have a different behaviour altogether to wild-born wildlife. Reintroduction is a delicate operation which requires the expertise of field and zoo personnel alike.

Ironically, no reintroduction work whatsoever has been done for some of the vanishing species of small mammals which, posing little threat to humans, could be very successfully reintroduced. Again, one reason is that no zoo has concentrated much on small mammals to build up a stock suitable for reintroduction. This is fertile ground for future projects.

Although reintroduction, introduction, etc. is dramatic and fascinating, there are so many problems to get around that the effort required and the indirect and unexpected results of reintroduction may negate all the supposed good. A more viable use of captive breeding for wild conservation may depend on high-tech reproductive science which enables field biologists to enhance a wild gene pool in one area with genetic material (sperm, embryos) from another which has been nurtured in a zoo. Some wild populations are so small today that the zoo population is needed to enhance their gene bank!

Conservation education

Finally, the most effective conservation activity which zoos can carry out is education. This they can do better than any other agency, institution, facility or centre. Rather than become complacent about breeding for return to the wild, zoos would do better to use their educational potential to create a panic in the general public which would inspire the common man to do his bit for habitat protection. In this area, of conservation education, Indian zoos have a potential which has not even begun to have been tapped.

Although solid statistics have not been calculated, a casual glance at the yearly visitation figures for a few zoos tells us that zoos are very popular in India. Even small zoos, such as exist in medium or small towns, draw hundreds or thousands of visitors a day and may be the only recreational outlet for hundreds of miles. Systematic educational programmes both in the zoo itself and outreach activities to schools and other institutions can not only create awareness and excitement in millions of people about wildlife and conservation, but also ensure that their behaviour is correct when they visit zoos and national parks. A major problem in zoos is badly behaved visitors who cause stress to animals by teasing, and disease or ill-health by feeding them inappropriate food.

Few zoos in India have an Education Officer or Curator of Education, much less an adequate budget, supplies and staff to carry out the myriad projects that are possible on this subject. Every zoo, even the smallest, should have an education programme. In this area, voluntary societies could be invaluable, particularly to small zoos with no budget or staff for education. In the west, Friends of the Zoo societies often take on the entire responsibility for educational activities in the zoo. With their hundreds of members they have an adequate work force to act as guards, guides and programme implementors.

Into action

The conservation community the world over appreciates the way in which India has taken up wildlife protection. Although there are still a myriad problems to solve (many of them a result of successful conservation), on the whole the Forest and Wildlife establishment has done a very good job.

That zoos have been neglected in favour of wildlife in the wild is forgiveable up to this point, but now there is really no excuse for such useful institutions to remain in the background.

All the spadework has been done for initiating a quantum leap in the improvement of zoos and captive breeding efforts in the country. The National Zoo Policy, combined with the proposed Zoo Authority of India, and amendments pertaining to zoos in the Wildlife Protection Act provides a complete framework for improving existing zoos, preventing spurious new zoos, and even closing incorrigible zoos. For the first time a coordinated, scientific and systematic overview of Indian zoos is on the horizon. Hopefully, captive breeding programmes and plans to implement the Zoo Policy will follow suit.