2 Gonyon, H W, Hemsworth, P H. and Barnett, J L., *Appl Anim Behav Sci*, 1986, **16**, 269–278
3. Hemsworth, P H, Barnett, J. L and Hansen, C., *Appl. Anim Behav Sci*, 1986, **16**, 259–267.
4 Denenberg, V. H., *Psychol Rev.*, 1964, **71**, 335–351
5. Hemsworth, P H, Barnett, J L. and Coleman, G. J, *Anim Welfare*, 1993, **2**, 33–51
6 Grandin, T., *Lab Anim*, 1986, **15**
7. Csermely, S., Mainardi, S and Spano, S, *Appl. Anim Ethol*, 1983, **11**, 177–182
8. Breland, K and Breland, M, *Am Psychol*, 1961, **16**, 661–664
9 Hutson, *Appl Anim Behav Sci*, 1985, **15**, 263
10 Kiley-Worthington, M and Savage, P., *Appl Anim Ethol.*, 1978, **4**, 119–124.
11 Brenner, K., *NZ J Agric*, 1980, September, 25.

Conflicts or coexistence?

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The sprawling American city of Los Angeles has obliterated vast areas of natural habitat in southern California, and its suburbs continue to encroach upon the remaining fragments of forest and coastal sage scrub, for condominiums and recreation. The Angelenos forest has, amazingly enough, survived to this day, and is one of the remnant fragments of wilderness near the city. Even this is surrounded by suburbia – and is a source of frequent conflicts between humans and wildlife.

A young mother jogging alone one evening on a mountain trail in the suburbs got killed by a mountain lion: the first known mountain lion attack on humans this century! The local police and fish and wildlife officials immediately swung into action and, in a couple of days, tracked down and killed a female mountain lion. Shortly after they confirmed – using genetic tests of hair samples – that it was indeed the same killer animal, a solitary mountain lion cub was found near where the jogger was attacked. The cub was then sent to a zoo. It seems likely that the jogger strayed too close to the cub – *Had she seen the animals? Did she deliberately approach them too close (like so many Americans brought up on the ideas of cuddly wild animals often do)? Or did she just blunder into them*? – and provoked the mother into attacking her.

About a month after the mountain lion attack, a big black bear strayed out of the Angelenos forest and wandered into a suburban mall. Panic ensued and the local police and wildlife warden were alerted. The game warden soon shot the bear dead after unsuccessful attempts to tranquilize it for translocation. A few weeks later, a panic-stricken 911 (the emergency telephone line) call from another LA suburb reported another black bear which the caller could see outside her/his window near a school. When the cops and game warden rushed in, they found the bear perched up in a tree *looking at some children playing in the schoolyard* – so it had to be shot dead too!

Reading about these incidents in the long, hot Californian summer of 1994, when a vast forested area outside LA was burnt down (by arsonists?) and huge tracts continued to burn all over the northwestern US, I could not help but wonder if we in the third world had anything to learn at all from this, the world's most advanced, industrialized, first-world nation, in terms of managing our wildlife and natural habitats.

I myself grew up in Bombay, a city often compared to Los Angeles or New York, but much worse in terms of infrastructure or civic amenities, and on an average, offering a lower quality of life to its inhabitants. Unlike LA, Bombay also faces a shortage of land to accommodate its burgeoning human population. Yet, bordering the megalopolis' northern suburb of Borivli lies a 100 km^2 tract of tropical forest protected in the form of a National Park. The forest is in remarkably good shape, considering it is completely surrounded by over 15 million human beings. The park also has a resident population of leopards estimated at around 20–40: certainly too high a density of large carnivores to be supported by the habitat. The Indian leopard is a larger animal than the North American mountain lion, with a long and continuing history of man-eating problems that keep cropping up all over the country each year. Many of the Borivli leopards, lacking space and food inside the park, venture outside the forest at dusk to pick up dogs and other small animals from the shanty towns bordering the park. Sometimes the prey include human children, and even adult humans have been attacked and killed. Yet, the leopards are tolerated and their population allowed to build up over the past many years. It was only recently – responding to a public outcry after a child's killing – that the forest department trapped two individuals, which, unfortunately enough, bashed themselves against the cages and died.

The Borivli leopards are by no means an exception to man–animal relations in India. There is another long-standing, recurring conflict between a large mammal and human beings in eastern India for which the solution still eludes the Forest Department. This is the case of the famous Dalma or Bihar – Bengal herd of elephants:

Animals are often entwined into the lives of rural Indians. Although frequently employed in earning a livelihood, they are also treated as members of the extended family.

a remnant population of about 40 animals that has lost almost its entire home range of tropical deciduous forests to the axe and the plough. This herd – of a species renowned for its long memory – flow wanders across the hills and plains as if in search of its lost homeland. Inevitably, they come into conflict with peasant humanity, which happens to produce the only foods now available to the elephants. So the elephants undertake their annual migrations after the monsoons carving a trail of destruction among the farms and villages: large areas of crops are laid waste – from the human point of view – and frequently, humans who dare to defy the giants get killed. Last year, its incredible march led this herd almost into Calcutta city: the Forest Department and villagers only barely managed to turn the elephants back from some 20 km outside the city, averting what could have been a disaster of spectacularly tragic proportions. Once again, in a now annual feat, the foresters and villagers managed to beat them back to their patch of remaining forest sanctuary – only to gain a few months of relief before the elephants set forth once more. As with the Bombay leopards, the only action the government has taken so far is to pay some compensation to the victims and talk of translocating the herd. Meanwhile, the people are already taking things into their own hands: at least three elephants were killed last year – victims of poisoning or electrified fences.

Virtually all the remaining wild elephants in India face this problem of habitat loss and fragmentation to some extent, and conflicts with humans are common. One recent case was that of a big tusker which took to raiding crops outside the Kalakad–Mundanthurai Tiger Reserve in Tamil Nadu and killed two villagers before it was itself tragically brought down by a fatal dose of tranquilizers pumped into it in an attempt to capture and translocate it. But there was little else the beleaguered Forest Department could have done – if they had not made the capture attempt, people may have taken things into their own hands with graver consequences. And so the casualties mount on both sides of this conflict.

Going back to the question of whether the West can offer us any new ideas on dealing with the problem of wildlife in fragments of natural habitat embedded in a humanized landscape matrix: the above stories seem to highlight a certain contrast between the two societies' approaches. On the one hand, we have a country of 950 million people, most of whom lead a hand-to-mouth existence, with hardly enough land to support them – but willing to share that land with its wild denizens, even at a substantial human cost. On the other hand is a country with barely a fourth of India's population occupying a landmass three times as big as India, and a much higher standard of living for its people – yet even the smallest trespass by a wild animals brings instant and fatal retribution! The way many western countries have systematically targeted wild animal species perceived to be inimical to human interests (largely economical), often with little real evidence – like the wolf and the coyote in North America and the dingo in Australia – suggests a basic lack of respect for Nature and its wild denizens. This contrast is indeed a historical one: one can certainly make a strong case that Indian society has always been more protective of its wildlife than any western nation, the vast differences in population, resources and standards of living notwithstanding.

Some of my American teachers, while lecturing students on the loss of biodiversity and human pressures on wildlife, like to show a clipping from a film on human population growth. The segment shows a map of the world with a number of red dots scattered across it: the animated map depicts the distribution of human population across the globe, each red dot representing a population centre of over 1 million people. As the animation starts from a few thousand years ago and reaches the present time, one sees the map filling up with red dots: initially quite slowly, but at an accelerating pace in the current century. The film makes quite a dramatic illustration of human population explosion and, accompanied with data on global extinction rates of different species, reinforces the popular correlation between population growth and loss of biodiversity. The subtext is the fact that the equatorial belt, or the South, with the maximum number of red dots is also the region with greatest threats to biodiversity.

But what struck me most was another element which actually subverts the above popular analysis: the fact that the Indian subcontinent – as indeed most of Asia – has always supported a disproportionately larger share of red dots. Yet the extinction rates in this part of the world did not shoot up until the arrival of Europe in India! Another interesting region worthy of such a fine analysis is South America: that continent had a fairly high density of red dots before Columbus discovered it, but many of these blinked out following the arrival of

Europeans. And again, there is little evidence suggesting extinctions caused by native Americans: the overall positive correlation between human population growth and extinction rates appears here too only in the post-Columbus era! This pattern has already been pointed out in some critiques of the biological expansion of Europe – but it remains in the realm of the subversive, on the fringes of mainstream ecological discourse, and has not made it into many university syllabi.

This suggests that the differences are indeed cultural, with the less modern pre-western societies being more tolerant of wildlife than the modern western ones. And so, one may be reassured about our own historically superior record – at least in this respect – and search for the older ways that allowed us to maintain this coexistence. But I suspect the Indian scenario is (typically, one may say) much more complex, much more ambiguous, given the overt and subtle interplay of cultural, social and economic differences inherent in our multilayered society. If the above examples highlight coexistence in Indian society at a broader level, the following stories suggest streaks of arrogant intolerance at some specific sublevels.

The story of the Sunderban – deprived humans pitted against man-eating tigers in the world's largest mangrove swamp and tiger reserve – is all too sordidly familiar. Perhaps the final solution – one way or the other – to this intractable conflict will come from global warming and its attendant rise in sea levels! And that gives rise to a vision of the homeless humans of Calcutta stranded between man-eating tigers on one side and elephants on the other, both rendered homeless due to different human activities – one shudders at such an image! But tigers do occasionally turn to human flesh in other areas as well, even if not on the same scale as in Sunderban: while the much-lauded Project Tiger has so far succeeded in protecting many tiger populations, it has failed to provide more habitat for the increasing tiger population, and individuals are often forced to forage outside the reserves. Man-eating problems are not infrequent in some of the sub-Himalayan tiger reserves, notably Dudhwa, and the Forest Department has often been forced to kill some of these problem animals. One particular instance from the late 1980s, however, is stuck in my mind. One tiger had, over the course of a few months, killed as many as 16 local villagers, but no action was taken: perhaps the villagers were trespassing to collect firewood or engaged in another such illegal act, and so were either not vocal enough in their protests, or otherwise invisible to the authorities. But then the tiger made the error of picking its 17th victim from among the staff of the Forest Department – and was killed soon after. As one of my teachers at the Wildlife Institute of India commented wryly, it may seem that in some parts of India the life of one forest official equals those of 16 poor villagers!

Going further back, even if it was the arrival of the Europeans in India that triggered off major ecological damage, these external forces were, nonetheless, aided and abetted by many within our society. While the white hunter may have brought the guns, it was largely the local Maharajas, Princes and Nawabs who drove the cheetah to extinction and pushed the tiger and many other species to the brink. On the other side of the human/wildlife conflict/coexistence coin are the Bishnois of Rajasthan: now an enduring symbol of a traditional conservation ethic with great respect for wildlife, hundreds of Bishnois were massacred 300 years ago for protecting the trees around their villages – not by any European imperialist agency but by their own local king.

Where does that leave us then? On the one hand, we show higher tolerance for wildlife than the West, even bearing some human costs. But on the other, the West treats its citizens more as equals when it comes to wildlife conflicts – each victim is avenged, so to speak – while we seem to place our own in a hierarchy of values. This might lead one to say that in India wildlife has more value than (some) human life – a position many of the poorer victims already articulate. Perhaps, it is not too surprising to learn that in a society where some people have always been more equal than others, some animals might also be held more equal than some humans! The West, though it has its human hierarchies, is nevertheless more explicitly homocentric when it comes to dealing with nonhuman nature.

What lessons may one draw from such comparisons? Neither approach satisfies anyone who is interested in ensuring justice for both the human and nonhuman life forms sharing this earth. The Indian approach of tolerance and sharing allows nonhumans to coexist with humans to a greater extent – but many humans suffer. Even these older values and ethics respecting nature are now retreating under the combined assault of western consumerism and increasing human needs within the country. The West is still in the process of evolving a new set of ecological ethics based on a modern biological understanding of the origin and role of life on earth. We may be in a position to offer a model (religion-based) framework for such ethics, which can be expanded and elaborated with the help of modern ecological understanding. It is perhaps time we start actively offering the West some of our knowledge and solutions to its own problems, rather than passively waiting for them to come and help solve ours. For neither culture knows the best answers and both are groping for the light – albeit one more confidently and assertively than the other.