

Towering Silence

For millennia Zoroastrians have used vultures to dispose of their dead. What will happen when the birds disappear?

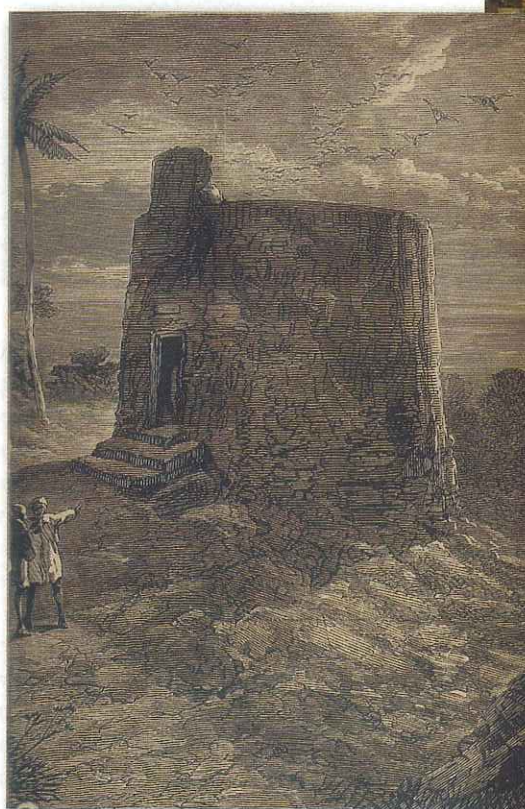
by Meera Subramanian

When Nargis Baria died at the age of eighty-five in Mumbai, India, her only child, a daughter named Dhun, initiated the death rituals of their Zoroastrian faith. Her mother's body was dressed in white, prayers whispered in her ear, and—after three days—a summoned dog's dismissal indicated that the spirit had moved on. It was time for the *nassesalars*, or pallbearers, to carry the body to the Towers of Silence, circular structures of stone located on fifty-seven, park-like acres in the heart of Mumbai, surrounded by the upscale high rises of Malabar Hill. They removed her clothing and placed her body in the middle of three concentric circles, one each for women, men and children. At the center was a well where the bones, the last of the last remains of a human body, would be swept in a few days time.

All the proper components of *dokhmenashini*, the Zoroastrian method of handling their dead, were in place, but the vultures that once completed the cycle by scavenging an exposed corpse in less than five minutes were missing. The custom, so ancient it was described by Herodotus 2,500 years ago, has come to an abrupt end in the past decade, as the vulture population of South Asia has plummeted. In addition to playing a crucial role in processing the human cadavers of this small religious group, vultures filled a vital ecological niche as scavengers of the dead and decaying matter that litters India's countryside.

Now everything has changed, and religious scholars and scientists alike are trying to make sense of the shift.

Since the days of their prophet Zarathustra in 600 BCE, Zoroastrians have



Zoroastrians in Mumbai lay the remains of their loved ones to rest at the Towers of Silence, circular pillars of stone where the bodies are eaten by birds.







A white-backed vulture, one of the three species of vultures that are dying across India.

used *dhokmas*, Towers of Silence, to dispose of their dead in what has been called a sky burial. In their native Persia, in modern-day Iran, they placed bodies on natural stone promontories exposed to the sun and the wind. When they migrated to India in the eighth century, they built a series of squat towers, now mottled with moss, for the same explicit purpose. With the disappearance of the vultures, Parsis, as Indian Zoroastrians are called, struggle to adhere to their faith. Rooted in a principle that they should live in harmony with nature,

Zoroastrians believe that earth, fire, and water are sacred and cannot be polluted by being exposed to a human corpse. For the traditional segment of the community based in Mumbai, burial and cremation are not options.

As the vulture population collapses, the Zoroastrians too are struggling to survive. Neither proselytizers nor open to conversion, Zoroastrians are estimated to number only two hundred thousand around the world; fifty thousand are concentrated in Mumbai. The future of the religion, which

predates Christianity and Islam and may have influenced both with its belief in a monotheistic God and a dualistic world of good versus evil, is uncertain. Often unable to find mates within their community, many are marrying non-Zoroastrians and traditional priests won't allow the offspring of the mixed marriages to undergo the *Navajote* ceremony in which a child enters the faith. And so their numbers decline.

Meanwhile, established members of their community continue to die, a thousand each year in Mumbai, and with the vultures gone, the Zoroastrians struggle to manage the deceased. A few years ago, solar reflectors were installed atop steel scaffoldings and directed at the bodies to speed up the process of decay without violating the fundamental tenet of their religion to avoid fire.

After her mother's death in 2005, Dhun Baria returned regularly to the towers to pray. She believed, like most of her community, that the solar devices had decomposed her mother's body within the required four days to completely free her spirit. But on her visits she overheard the gossip of the *nassesalars* as they spoke of the bodies piling up.

Baria hired a photographer to confirm the rumors. Sneaking into the inner sanctum, where only the *nassesalars* are allowed, he took horrific pictures of the bodies—eyes gouged out by crows—in varying states of decay.

"There are thousands of bodies rotting on the site," said Baria, agitated and angry. "There are no vultures at all and without the vultures, it doesn't work. The solar collectors don't work. Nothing is working. My mother's body was there for a year and a half, naked and exposed." She put the images on flyers and disseminated them widely. The response was polarizing. What did tradition mean if this was what happened to their loved ones upon death?

Given their intimate relationship with the vultures, the Parsis were probably the first to notice the dramatic decline in the early 1990s, but it was Vibhu Prakash, principal scientist with the Bombay Natural History Society (BNHS), who

recognized the gravity of the situation. He had studied the vulture populations in Keoladeo National Park, outside of Delhi from 1984 to 1989, and returned again a decade later.

"When I came back again, most of the nests were empty. I saw dead vultures everywhere—under the bushes and hanging from the trees, dead in the nests," said Prakash. "I was quite worried." In 1984, Prakash documented 353 nesting pairs in the park. By 1996, only 150 existed, and by 1999, not one pair remained. It was extinction in the making.

In November 1998, BNHS put out an alert and by the following year, biologists and naturalists from all over the country had confirmed that the three dominant species of South Asian vultures—white backed (*Gyps bengalensis*), long billed (*Gyps indicus*), and slender billed (*Gyps tenuirostris*)—were dying across the region. Initial speculation revolved around an infectious disease or bioaccumulation of pesticides, similar to the devastating effects of DDT on predatory birds a half century earlier. In 2000, the Indian scientific community called out to their international colleagues and an all-out effort was launched to determine what had caused vulture numbers to plummet from an estimated 80 million to just a few thousand in less than ten years. It was the most catastrophic decline in an avian population in recent history. The Royal Society for the Protection of Birds (RSPB), Peregrine Fund, U.S. Fish and Wildlife Service, and IUCN Specialist Group, among others, joined in the pursuit to find what was pushing the *Gyps* vultures toward extinction.

Within a year, studies had ruled out pesticides and determined that the cause of death was visceral

gout, although what was causing the gout remained a mystery. In 2001, BNHS began a captive breeding program in Pinjore, northwest of Delhi. But finding enough vultures to support a viable breeding program—twenty-five pairs of each species located at six different centers—has proven difficult. So far, BNHS has established only three of the centers, and none of the chicks born in captivity have survived. "We are trying very hard to get the necessary birds," said Prakash, "but the populations have become very small. This situation is unprecedented. The government of India is taking steps but it does not match the magnitude of the population crash."

It wasn't until April 2003 that a microbiologist at Washington State University, working with the Peregrine Fund and partners around the world, finally isolated the cause of the collapse. When Dr. Lindsay Oaks went to Pakistan in 2000 to collect samples, he couldn't believe the number of vultures. "As soon as I walked out of the hotel in Lahore, we saw vultures roosting

in Lawrence Park right in the middle of the city. They were all along the roads outside of town and, at the three colonies we went to, there were a thousand birds and nests all over the place. It was the same as seeing a starling here. Virtually all of those colonies are gone now."

Oaks discovered that the three species of *Gyps* vultures were dying from ingesting livestock carcasses treated with diclofenac, a non-steroidal anti-inflammatory and antipyretic pharmaceutical drug used on both livestock and humans. It is a mild painkiller akin to aspirin. In early 2006, a British pharmaceutical lab developed a safe replacement drug, meloxicam. But it took another three months before the Indian government officially enacted a ban on diclofenac, and an actual phaseout could take years. The government has not banned the human form, which is still sold for veterinary purposes, rendering the ban ineffective.

Rick Watson of the Peregrine Fund describes the decline as catastrophic.



Carcass dump outside Mumbai. Human, as well as animal, remains are not decomposing due to the depletion of the vultures.

Courtesy of the Peregrine Fund

"A population can withstand the loss of young for many, many years, but they can't survive the loss of breeding adults, especially at this rate." The *Gyps* vultures are also slow to mature and only raise one fledgling per year, adding to the difficulty of a successful captive breeding program.

Just as the vultures neatly and efficiently disposed of a thousand Parsi bodies each year, they also dealt with millions of other carcasses in a land where Hindus are forbidden to handle dead cattle and Muslims won't touch an animal not killed in the religiously prescribed *halal* manner. "*Gyps* vultures are most effective and efficient scavengers," said a press statement put out by the government of India in 2005. "Their role cannot be over-emphasized given the large livestock population, poor carcass disposal and non-consumption of beef."

Still, no one knows why these three species are so mortally affected by diclofenac. "*Gyps* are susceptible at residual levels—a tenth of the normal therapeutic dose for animals," said Oaks. With zero tolerance, it is a game of Russian roulette each time they circle down on their massive wings to feed on a carcass. Studies show that the vulture population can't survive even if less than one percent of the remains have the drug in them. Once ingested, the vultures develop gout and die in less than a month. Neovet, an Indian pharmaceutical company, estimated that 5 million animals were being treated annually before the ban.

The Parsis are feeling the immediate effect of the vultures' imminent extinction, but all of South Asia, which a decade ago accounted for more than three-quarters of the world's vultures, will increasingly notice their absence. Nature abhors a vacuum. "There's a massive superabundant source of food readily available," said Munir Virani, who manages the Asian Vulture Crisis Program for the Peregrine Fund. "Something else will come. We are sitting on a time bomb."

With the carcass dumps overflowing, feral dog and rat populations are exploding. Virani and others have witnessed 1500 wild dogs at one such dump, a terrorizing sight. For India, which already accounts for 80 percent of the world's rabies deaths, thirty thousand per year, an increase in wild dogs is foreboding. Neglected cattle carcasses also become a breeding ground for disease, including anthrax, tuberculosis, and foot-and-mouth disease.

Meanwhile, the Parsis are left with their dead. The Bombay Parsi Panchayat, the trustees who control the towers, initially consulted with Jemima Parry-Jones, a raptor expert and director of the National Birds of Prey Centre in England, to see what could be done. They considered building an aviary over the towers, raising the vultures in captivity to eat their dead. "The Towers of Silence in Mumbai were a superb system," said Parry-Jones. "For centuries, it worked and was very tidy and clean. This has been a disaster for them."

But once diclofenac was isolated as the cause, Parry-Jones returned to the Parsis and told them an aviary was out of the question. With hundreds of forms of diclofenac regularly prescribed to people on their deathbeds, it would have been the equivalent of laying out poisoned bait. But Prakash remains hopeful that the Zoroastrians, known as educated and progressive people, can become diclofenac free and an aviary still established at the *dhokmas*.

Many Zoroastrians believe that adaptation is their bridge to the future. By necessity, the Zoroastrian diaspora has already opted pragmatically for cremation or burial when *dokhmenashini* is not available. Many in India, including Dhun Baria, are advocating the allowance of cremation while still conducting the final rituals at the Towers of Silence.

"It's not that we're not Zoroastrians," said Fali Shroff, who serves on the board of a Zoroastrian temple in New York and raises money to support the *nassesalars* in Mumbai, "but in this day and age, sometimes certain things are not practical." Reflecting on the contentious state of Parsi affairs in India, from the handling of their dead to intermarriage, Shroff laments, "There are too many controversial issues going on between the traditionalists and the reformists, too many scholars with self-appointed authority. It is bastardizing the religion and dividing the community." Many Zoroastrians, in India and abroad, feel the rigidly traditional *panchayat* has too much control over the direction of their faith. But still others argue that the solar reflectors can be improved.

Change, genetic or cultural, can ensure long-term survival of religious sects and avian subspecies alike, helping to cross the tenuous divide between the past and future. Virtually nothing remains completely static and survives.

But the vultures cannot adapt to this drug. With zero tolerance, none of the vultures that eat the poisoned flesh survive; thereby, they cannot pass on a resistant gene to their offspring. "There's no active process where the vultures can build up a resistance," said Oaks.

Vibhu Prakash has been witness to the collapse of the South Asian vultures from the beginning. "I am hopeful, but I am not very optimistic," he said. "The protection efforts really have to go up, or it's going to be very difficult." But hope does remain. Imagine the future, a decade or a century from now. The Towers of Silence are still standing, slightly more moss softening their ancient stonework, and the vultures have returned to feast on the Parsi bodies. The ancient rituals resume, intertwined with stories of a time when wild vultures were raised in captivity. &

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