

Letter from the Desk of David Challinor
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Just north of the Smithsonian's National Zoo on Connecticut Avenue in Washington, D.C. is the art deco Kennedy-Warren apartment complex. When winters were colder in the 1970's, a few score black and turkey vultures roosted regularly on the roof's south-facing parapet. Ted Reed, then Zoo Director, would receive frequent irate calls from the apartment's elderly tenants demanding that these birds stay confined to the Zoo, from where they assumed the birds had escaped. The complainants often concluded their calls with the accusation, "Don't you know they are a symbol of death?" The association of vultures with death is understandable; in both the New World and the Old, the two unrelated vulture populations are bare-headed carrion eaters. This month's letter will consider the remarkable morphological convergence that enabled these two separate families to adapt so easily to specialized diets. Humans tend to disdain carrion eaters, despite our illogical craving to dine on crabs and lobsters—carrion consumers nonpareil.

The huge griffon vulture (*Gyps fulvus*), only a bit smaller than condors, was well-known in the ancient world. Stylized images of these birds, perched with their wings outstretched to dry, adorn many pharaohic monuments. Even the much smaller Egyptian vulture is frequently depicted in tombs and has long been referred to as "Pharaoh's chicken." Jane Goodall, the primatologist, observed this extraordinary bird throwing stones of up to half a pound (300gms) with its beak in order to break ostrich eggs abandoned by the incubating male during a grass fire. Years later, Roger Tory Peterson actually filmed this tool-using behavior.

Griffon vultures, named after the mythical beast that had an eagle's head and a lion's body, are not tool-users, but rather wait patiently until the mammal on which they plan to feed is truly dead. In fact, before feasting on a fresh carcass, griffon vultures will congregate nearby and wait for large solitary vultures with powerful bills to tear open the fresh carcass; these include the Lappet-faced (*Torgos tracheliotus*) in Africa, or in India, the large solitary Black vulture (*Sarcogyps calvus*).

Griffon vultures (genus *Gyps*) are wide-spread with species ranging from either side of the Mediterranean all the way to the Himalayas, India and into Southeast Asia. One species lives across Africa, south of the Sahel to the Red Sea, while another, the Cape Vulture, is confined to southern Africa. Griffon vultures have long necks and heads covered with sparse white or grey down. All species have a feathered ruff at the base of the neck—a characteristic believed to have evolved as a kind of bib to protect their body feathers from being soiled by the offal they consume. Despite their diet, which disgusts most people, griffon vultures do bathe when water is available and carefully extend their wings to dry in the sun.

Years ago, when I first came to the Smithsonian, the Zoo had a solitary griffon vulture in its collection. It escaped, somehow, and successfully avoided recapture all summer. Its favored roost was on the roof of the Alban Towers apartments at the intersection of Massachusetts and Wisconsin Avenues—no more than a mile west of the Zoo. It disappeared in the late fall, but we subsequently learned that the apartment's janitor fed it regularly—with what, we do not know. To this day, I wonder whether it flew south; it vanished from Washington without a trace and we will likely never know.

In the Old World, griffon vultures have fallen on hard times. In the Magaliesberg mountains, only 30 miles west of Pretoria S.A., a colony of Cape griffon vultures roost in the cliffs. When the sun rises sufficiently to create thermal updrafts, the birds begin to soar, looking for carrion. Where herds of large ungulates once grazed on the plains below, the suburbs of Pretoria and Johannesburg now stretch west. The occasional dead cow scarcely meets the needs of these scavengers, so to keep them from vanishing, concerned scientists and conservationists have established “vulture restaurants.” Besides persuading local farmers to cease lacing the carcasses of their dead livestock with poison to kill jackals and other carnivores they rank as pests, the carcasses are now hauled to fenced sites established as uncontaminated “dining areas.”

An intensive monitoring program begun in the early 1970's has shown that there were more than 4,000 pairs of Cape vultures breeding annually, but only about half the hatched chicks survived their first year, and of those, only about 15% lived to the breeding age of four or five. Females lay only one egg each year. Careful observation also showed that chicks were suffering from calcium deficiency that led to deformed wing bones that in turn prevented fledging.

Before the veldt was settled, not only vultures but spotted hyenas scavenged zebra carcasses. Hyena jaws are so powerful that they can crack even the largest bones to eat the marrow. As a result, bone chips and splinters were plentiful. Vultures carried these calcium-rich bone splinters to feed their chicks, just as poultry farmers furnish crushed oyster shells as a calcium source for their laying hens. With the disappearance of hyenas, there are no longer bone fragments lying around; no other resident mammal has jaws strong enough to shatter large bones. Supplying human-cracked bones to the 100 or more vulture “restaurants” has solved the problem of wing development. The concept of feeding the Cape vultures has spread widely in South Africa; in addition to old cows, race horses and even a marauding elephant bull that had to be shot were donated. Perhaps the most macabre and bizarre carcass at a feeding site was that of a local farmer who shot himself in 1987 at the vulture restaurant on his farm. He did so after neatly stacking his clothing so that the birds would not be scared off by flapping clothes.

In India, where the majority Hindus revere cows and thus do not kill them for meat, virtually all dead cows were rapidly consumed by the two major species of Gyps—the white-backed vulture (*G. bengalensis*) and the smaller Long-billed vulture (*G. indicus*). Sadly, in the past decade or so, vultures in India and Pakistan have almost disappeared with populations there declining at a rate of 50%/year. An international

scientific effort finally determined that the cause of death was renal failure initiated by a residue of diclofenac, a non-steroidal drug commonly used to treat inflammatory conditions in cattle, as well as humans. The local vultures, evidently, lack the genes that enable them to release the enzymes that in most other healthy creatures detoxify the drug. Both India and Pakistan have now banned diclofenac to treat cattle in hopes that it might not be too late to save the surviving vultures so crucial for rural sanitation. An unanticipated side effect of the demise of vulture populations is the explosion of feral dogs that replaced them as scavengers. So many dogs, in turn, increase the risk of rabies among the crowded towns and cities of the subcontinent.

A more obscure consequence of the virtual disappearance of vultures in western India is the effect on the funerary customs of the Parsi, a relatively small Zoroastrian religious group concentrated in Mumbai (Bombay). Although they probably originated in northeastern Iran, the Parsi fled that country about 1300-1400 years ago and settled in what is now Mumbai. For Parsi, fire, earth and water are sacred elements and may not be defiled by human cadavers. To avoid such degradation, instead of burial or incineration, corpses are left on Towers of Silence where they are consumed by gyps vultures. With a dwindling vulture population, crows and other scavenging birds scarcely replace them, and Parsi are now forced to use concave solar reflectors to speed decomposition.

Although few in number, Parsi are well-known world-wide for their artistic and business talent. Both Zubin Mehta, the conductor, and J.R.D. Tata, the industrialist, are Parsi. Help for their funerary tradition is on the way, however, in both rural India and Pakistan. As was done in South Africa for the Cape Vulture and in California, Arizona and Mexico for the California condor, feeding stations with carcasses uncontaminated by lead shot, diclofenac and other toxic elements are now being established. With patience and good luck, the gyps vultures may re-establish themselves through dedicated human assistance. Conservationists have revived endangered populations of brown pelicans, bald eagles, peregrine falcons and numerous other species. As an optimist, I am confident these vultures can be saved with enough good will and dedication—qualities refreshingly still available, but ones that must be appropriately tapped and mobilized.

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P.S. Information on Cape vulture restoration came from: Armstrong, Sue. Dining with Vultures, *New Scientist* 17 Nov. 93 pp.41-43.