

Letter From the Desk of David Challinor
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One of my early memories of the National Zoo (1970's) was seeing the African plains exhibit of a mixed herd of zebra and wildebeest. That site, now part of the cheetah enclosure, eventually proved to be too small to contain both zebra and wildebeest: when the antelopes were attacked by the zebra stallion, they lacked sufficient "retreat" space and suffered from the stallion's aggression. All zebras were then moved to Front Royal where they lived for several years before being dispersed to other zoos. Shortly after the cheetahs came to the zoo (four or five years ago), three young male Grévy zebra occupied the paddock adjacent to the cheetahs. Zoos have displayed zebras for centuries for their striking appearance, their popularity with visitors, and their easy adaptation to relatively confined quarters. This letter is about zebras: their different kinds, their spectacular marking, and efforts to domesticate them.

There are three zebra species, all living in Africa. The most numerous is the Plains zebra (Equus burchelli), ranging from South Africa's Kruger Park north to southern Sudan and west to southern Angola and northern Namibia. The western population overlaps the range of the smaller Mountain zebra (E. zebra), which differs from its larger relative by having a fold of skin on its neck. The third extant zebra is Grévy's (Dolichohippus grevyi), the largest. Thin stripes and mule-like ears identify this zebra found in northern Kenya, southern Sudan and adjacent Ethiopia. Even though the range of the Plains zebra overlaps that of both the Grévy's in the north and the Mountain zebra in the far southwest of Africa, there is no evidence of interbreeding. Not only are their respective ecological niches different, but a further barrier to hybridization, even within the occasionally observed mixed species herds, is that each of the three zebra species has a different chromosome count. The progeny of experimental cross-species matings in zoos are all infertile, as are mules whose sires and dams have different chromosome numbers. Despite their lack of fertility, mules have been bred for their endurance, strength and surefootedness for millennia, since shortly after horses and donkeys were domesticated about 4000 years ago.

Why did the people in Africa, surrounded as they must have been by a wide variety of ungulates, never domesticate the zebra? On the other hand, why did the people living on the Asian steppes domesticate the horse and those in the Near East tame and breed wild sheep, goats and cattle millennia before they did horses? Although a definitive answer is unlikely, we can speculate that the megafaunal biomass in East Africa at that time was much greater than that of the Near East or the Asian steppes, so there was little incentive to domesticate such a readily available meat source. The early domestication of sheep, goats, pigs and cattle in the Near East was perhaps only possible because of the extreme fertility of the Tigris and Euphrates river valleys which led to early farming and eventually to the first Neolithic farm settlements. The stability and relative permanence of these villages could have led to animal domestication. The

Asian steppe dwellers only became horsemen two or three millennia after they had been exposed to their western neighbors and recognized the advantages of readily accessible domestic livestock. To be useful, horses and camels not only had to be lured to stay nearby like sheep and goats but also had to be broken for riding; hence their later domestication. Such fertile conditions for farming and village development apparently did not exist in most of Africa, which helps explain further the lack of suitable conditions to domesticate African ungulates. A similar situation precluded the taming of bison in North America, but the existence of permanent villages in the Andes was favorable for the domestication of wild camels for wool (alpacas) and for pack animals (llamas).

When animals have been domesticated elsewhere, they may be rapidly accepted by other cultures, as seen in the spread of pastoralism across Africa or the prompt use of horses by American Indians. The availability of abundant pasturage in East Africa even overcame the constraints imposed by tsetse fly-disseminated livestock diseases. Once the latter was controlled, cattle raising by many African cultures became well-established.

The arrival of Europeans in Africa triggered efforts to exploit local fauna. Few enjoyed lasting success. African elephants were trained successfully in the then Belgian Congo and sporadic efforts continue. Elephant-back game viewing is now available in Botswana as African elephants are as trainable as their Asian relatives. Eland are raised for meat and milk, not only in Africa but in the Crimea and Brazil. Ostrich are still domestically bred for plumes, leather and meat in South Africa and California.

Such efforts at domestication of African animals started slowly. The first zebra, a mountain one from South Africa, only arrived in England about 1750. It attracted such attention that George Stubbs, the foremost animal portraitist of his day, did a magnificent painting of it. Their novel appearance was soon exploited and a Mr. Perkins created quite a stir in Victorian society with his zebra-drawn phaeton in Hyde Park. Lord Rothschild had himself photographed driving what appeared to be a zebra four-in-hand, but close inspection reveals that the two offside (away from the camera) members of the team were zebra-sized ponies.

Zebra novelty wore off even before the time that motor vehicles began to replace horses, but it was unlikely they would ever become a popular domestic animal. They evolved to sprint suddenly to escape a lion and thus lacked the working endurance of a horse which had been bred over millennia for many purposes. Zebra hybrids (Grévy stallion X mare), however, proved tractable pack animals and Raymond Hook of Kenya used them for many years to carry supplies for climbers of Mt. Kenya. Except for highly specialized purposes, such as circus parades, it is unlikely we will see zebras competing successfully with horses, donkeys or their hybrids.

One intriguing question is whether a zebra is a black animal with white stripes or vice versa. They are usually thought of as having black stripes on a white background. Spots and stripes on many animal species evidently preceded solid dark colors in the evolution of coat patterns, so the partial disappearance of stripes on the body of the quagga (an extinct zebra

subspecies) may have been a first step towards becoming a solid color. If the quagga had not been killed off by Boer farmers, it might have evolved to have an unstriped pale brown coat. The dark stripe down the back of a dun-colored horse may also be a relict of a once striped animal, and faint leg bands and shoulder stripes in some of the wild asses attest to past, more extensive body striping.

Stripe patterns are not only diagnostic among zebra species but are as unique as human fingerprints for each animal. This fortuitous characteristic enables field researchers to keep track of individuals in a herd by memorizing or using photographs of coat markings. Striping can mute body contours and thus act as camouflage – a precedent for painting zigzag patterns on ships during both world wars to make them less visible targets for submarines.

Zebras are certainly attractive to look at and exhibit well in zoos and animal parks. Their future presence seems assured, although the two less abundant Mountain and Grévy species deserve careful protection and management in the wild. Political instability in the Grévy's range may be the greatest threat to their future survival. Free-ranging, but managed herds of Grévys in New Mexico and elsewhere in this country are insurance against the threat of their extirpation in Africa. Future large-scale domestication of any zebra species seems unlikely because the process would be long and, if successful, the demand would be limited. Let us enjoy the zebras when we can both in the wild and in zoos.

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