

The Giraffe in Its World

Craig Holdrege

In standard evolutionary thought, the giraffe tends to be explained in terms of a “long-necked survival strategy.” In In Context #10, I described the shortcomings of this view. Now, in the following, I begin painting a picture of the giraffe’s characteristics free from explanatory schemes. This and the article in the previous issue will be incorporated into a monograph in our Nature Institute Perspectives series.

A LONE GIRAFFE BULL stood at the edge of the scrubby bush forest that opened into a grassland. The grasses and forbs were yellowed and brittle. It was August, the beginning of spring, but also the middle of the dry season in the southern African savannah. Many trees and bushes had no leaves, some still bore fruit, and others were just beginning to flower.

The giraffe didn’t seem bothered by our presence, although we were off the main tourist track. Since we were quite close, the giraffe’s towering height was striking. Long narrow legs carried its barrel-shaped, beautifully brown and white-patterned body high above the ground. Its back sloped downward, extending into the tail with its long strands of wavy hair that nearly reached the ground. Towards the front the body took on more bulk and, sloping steeply upward, merged into the massive and skyward-reaching neck.

From its lofty perch, the giraffe watched us calmly with its dark, bulging eyes. It was not excited; it was not aggressive. When it turned its head to face us directly, we could see its fine, out-curving eyelashes encircling its attentive eyes. This particular giraffe captured our attention for a good while. It was eating. But it was not feeding on the leaves of trees and bushes, as we’d grown used to seeing. There were no trees or bushes within its reach, and its head was not lowered to the ground grazing. No, this giraffe was chewing on its hardy meal, which was partially sticking out of its mouth. Imagine a giraffe smoking a giraffe-sized cigar and you can get an inkling of the scene. The giraffe was feeding on a sausage tree fruit. These fruit really do look like sausages (or big cigars), and sausage trees hang full of

them at this time of year. They are about one to two feet long, two to three inches in diameter and can weigh up to twenty pounds.

About six inches of the long fruit were protruding, so that the other twelve inches or so were in the giraffe’s mouth. It was chewing with circling motions of the lower jaw. Every now and again it would raise its head in line with its neck and gulp, as if it were trying to swallow the fruit. But the fruit never budged. We wondered whether it was stuck and were worried, since, at the time, we didn’t know that giraffes do eat these fruits during the dry season. But the giraffe didn’t look concerned and was apparently in no rush; with a sausage as its meal it didn’t need to wander around. I don’t know how long we were there, but eventually we moved on, wondering whether the giraffe succeeded in getting this long fruit through its long mouth down into its long throat.

The giraffe is an animal in which everything seems built around lengthening—from its tail hairs to its long eyelashes, from its long legs to its long neck and head. It was an unexpected gift to come across a giraffe that was embodying elongation to the fullest, eating that long fruit of a sausage tree.

The Giraffe Within the Landscape

There is nothing like seeing a giraffe in its natural habitat—dry savannah grassland with groups and thickets of



A lone giraffe walks across an opening in the savannah of Botswana. (Photo: Craig Holdrege)

thorny bushes and trees. When a giraffe stands in or is moving across an open grassland, you can see it from far away. It is conspicuous like no other animal. After spotting an individual or group of giraffes when I was observing giraffes in Botswana, I would take my binoculars to view more closely. Invariably I found the giraffes already looking at me (or at least at the land rover I was perched in). The giraffe has the largest eyes among land mammals. Since its eyes are set at the sides of a head that rises five meters above the ground, the giraffe has a very large field of vision. It is keenly aware of moving objects in its visual field. In viewing the giraffe from afar, you have the impression of a lofty creature sensitive to the happenings within its broad horizon.

When you leave the open grassland and wind your way slowly through wooded and bush areas, you often come upon giraffes at very close distance without any preparation. Among trees, the giraffe seems to disappear into its habitat—a stark contrast to its visibility in the open landscape. At least two features of its appearance allow it to blend in this way. First, with its long upright legs from which the neck branches off at an angle, the giraffe's form follows the lines of the tree trunks. When as observers we are close to the ground looking horizontally, what we see (or rather overlook until it's very close) are the narrow legs that meld in among the many trunks of the acacia or mopani trees. The second factor is the giraffe's spotted coat. Despite the variety of coat patterns in different populations and subspecies of giraffes, all have in common the

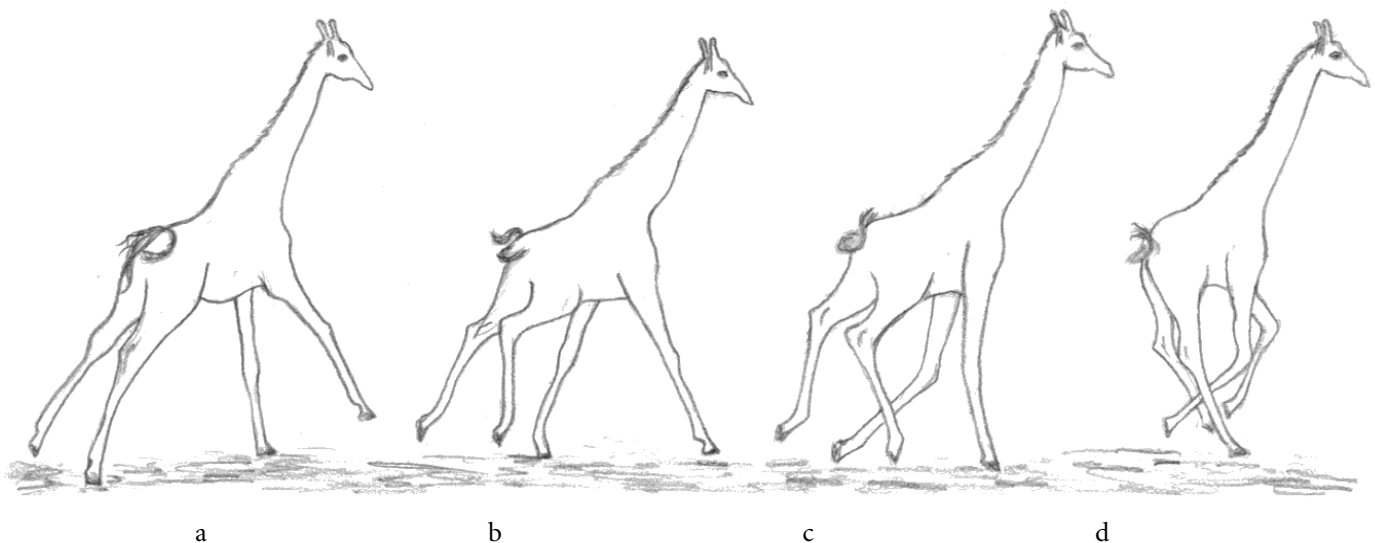
brown (varying from reddish to black) spots separated by white spaces or lines. When a giraffe is among trees, this dark-light pattern is similar to the mottled pattern of brightness and shade that plays among the branches and leaves. So with its unique shape and coat pattern, the large giraffe recedes into its wooded environment.

It is also the case that the giraffe does not make much noise, either while feeding (browsing off the trees and bushes) or after it notices you. It may stand and watch you from on high for a moment, swing its head and neck around and then amble off. Rarely it makes a snorting sound during such encounters, but that is usually the limit of its minimal aggressiveness. In contrast, an elephant may tread silently, but it loudly breaks off branches while feeding, and trumpets loudly and makes a mock charge when surprised.

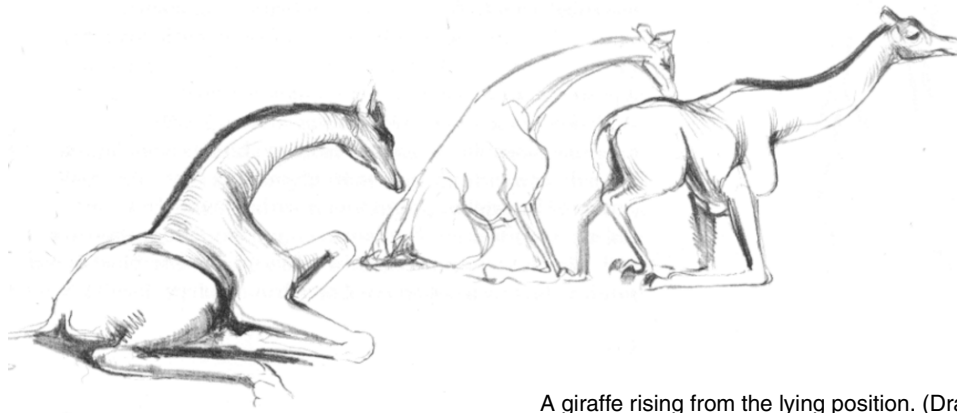
“Giant Speckled Flowers, Floating Over the Plains”¹

One of the most striking things about the giraffe is the way it moves. An adult giraffe can weigh up to 1,100 kg, yet its movement appears almost weightless. The giraffe has two different gaits—the ambling walk and the gallop. In contrast to most ungulates, the giraffe walks by swinging its long legs forward, first both legs on one side of the body and then both legs on the opposite side. This type of walk is called an

1. Isak Dinesen, quoted in Stevens 1993, p.6.



A galloping giraffe. a): the most extended phase of the gallop as the left foreleg has reached the ground. b): the right foreleg reaches the ground. c): the right foreleg is on the ground and the hind legs swing in. d): the legs are bunched together and the neck is at its most upright as the right hind leg approaches the ground. (Drawings by author after photos in Dagg and Foster 1982, pp. 100-101.)



A giraffe rising from the lying position. (Drawing by Jonathan Kingdon 1989, reprinted by permission from Elsevier.)

amble, and the giraffe has it in common with okapis, camels, and llamas. In contrast, other ungulates walk by simultaneously moving the left front and right rear legs and then the right front and left rear legs. The amble has a flowing, rhythmical quality to it and the giraffe's body and neck swing side-to-side, counterbalancing the one-sided movement of the legs.

The giraffe's legs are longer than any other mammal's, which gives it a very long stride. In addition, its forelegs are longer than its hind legs so that its gait is unlike that of any other mammal. When walking, its rear leg touches the ground about 50 cm (20 inches) in front of the spot from which it lifted its front leg. Because the giraffe is so large, the motion of the legs seems almost in slow motion. And with its center of gravity so high up, and its attentiveness concentrated in the elevated head, the giraffe seems to sweep along, hardly in contact with the earth. It treads on the earth, but it certainly does not appear to be of the earth. As Jane Stevens describes, "I watched as a group of seventeen floated along the edge of a yellow-barked acacia forest" (Stevens 1993, p. 6).

The unearthly quality of movement intensifies when the giraffe accelerates into a gallop. Its stride lengthens even more and all four feet leave the ground. When off the ground, the forelegs reach far forward and the neck becomes more horizontal. The feet come close together when they, one after the next, touch the ground; at this phase of the gallop the neck reaches its most vertical position. The faster the giraffe moves, the more its neck moves down (forward) and up (back). A giraffe can attain a speed of 55-65km/hr. The long swinging movements of both the legs and neck and the rhythmical expansion and contraction (spreading out in thrusting forward and contracting into the vertical while landing) are a fascinating sight. The impression that you are watching an animal in slow motion is accentuated during the gallop.

Dagg and Foster describe the mechanics of the giraffe gallop in more detail:

The power and weight of the giraffe are more in the fore-quarters than in the hindquarters, so that the main propulsion for each stride comes from the forelegs. By pressing forward at the beginning of each stride, the neck moves into line with the power stroke. The neck facilitates the movement by shifting the center of gravity of the giraffe's body forward and more nearly over the forelegs. At the end of each stride or leg swing, as the hooves touch the ground again, the neck moves backward in order to slow down the forward momentum of the body and enable the giraffe to keep its balance. (Dagg and Foster, 1982, p. 102)

In other words, the pendulum motion of the neck helps to propel the giraffe forward and aids in maintaining balance. No other mammal's neck plays such a role in forward movement! And in no other mammal do the forelegs give the main propulsive force, a task usually taken on by the rear legs. Thus the giraffe's unique form of motion arises out of the interplay of its unusual characteristics—its long neck, short body, high center of gravity, and long legs.

The giraffe's neck not only plays a role in walking and running, but also is absolutely necessary in aiding a giraffe to stand up, as biologist Vaughan Langman describes:

A giraffe, unlike most other mammals, is totally reliant on its head and neck to rise from lying on its side. In order to get off the ground, it must throw its head and neck toward its legs and use the force of the throw to bring [the giraffe] to its stomach. To come up to a standing position requires another throw of the head and neck, this time back toward the tail; once again it is the momentum of the head-neck throw which makes it possible for a giraffe to stand [up]. (Langman 1982, p. 96)

The giraffe's neck, which stands out so conspicuously in a morphological sense, also takes on a prominent role functionally in its movement.

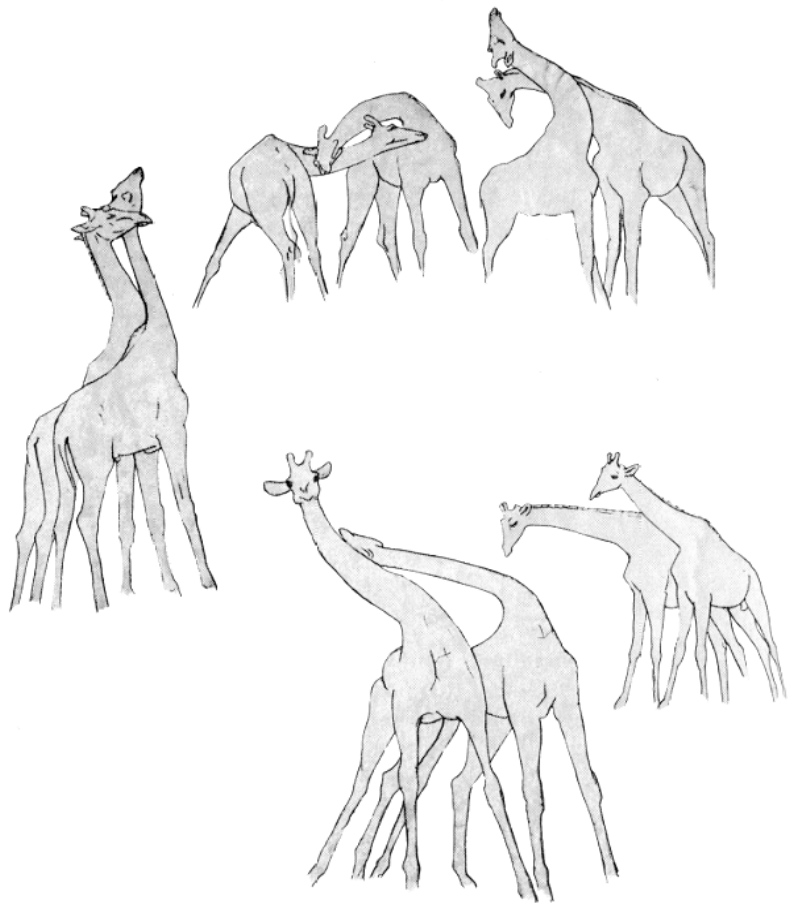
“Necking”

Movement and counter movement appear rhythmical and synchronized, imparting the sinuous grace of a stylized dance. (Estes 1991, p. 205)

Imagine a grouping of younger and older male giraffes. One animal starts moving closer to another, until the two are perhaps four to five meters apart. He raises his head and neck into an erect posture, emphasizing his height and uprightness. (We might say, anthropomorphically: emphasizing that he's a *real* giraffe.) If the other male responds similarly, they begin walking toward each other, stiff-legged and with legs splayed. They come to stand facing in the same direction, body next to body. They begin leaning and rubbing flanks, necks, and heads against one another. Both giraffes stand with splayed forelegs. One giraffe will swing his neck out to the side and swing it back, making contact with the other's neck. The partner responds with the same kind of neck swing. So ensues the “rhythmical and synchronized...dance” that Estes characterizes.

This “necking behavior,” as it is dryly named, can either stop after awhile or transform into a more forceful sparring (Coe 1967). In this case the blows with the head and neck become much more powerful and the slap of contact can be heard far away. When the two giraffes stand side-by-side, but facing in opposite directions, the blows tend to be more violent. Necking bouts may last only a few minutes when one male is clearly dominating the bout. But when the partners are more evenly matched they can last for more than half an hour and they have even been described as going on for hours. Rarely is a giraffe hurt in these necking bouts; usually one of the giraffes simply stops “necking” and wanders off.

Sparring and dominance bouts among males are known from many ungulate species. What's characteristic about this kind of behavior in the giraffe is that the neck plays such a central role. The broad, undulating sweeps of the neck have, as Estes expressed it, “sinuous grace.” The character of the giraffe comes clearly to expression in this remarkable form of behavior.



“Necking” giraffes. (Reprinted from Kingdon 1989 with permission from Elsevier)

Lofty—and at a Distance

With its “lofty stature” (Darwin), the giraffe commands a large overview. It's not surprising that the sense of sight plays a dominant role in the giraffe's life. It can see fellow giraffes, but also predators such as lions, from far away. The giraffe's vision is keen—as already mentioned, a giraffe usually sees you before you see it. Experiments in captivity indicate that giraffes also see colors (Backhaus 1959).

Giraffes are not solitary animals, living as they do in herds of varying sizes (often between ten and fifty animals). But as biologist Richard Estes puts it,

The giraffe is not only physically aloof but also socially aloof, forming no lasting bond with its fellows and associating in the most casual way with other individuals whose ranges overlap its own. (Estes 1991, p. 203)

Giraffe herds are more accurately described as loose groupings, since their composition continually changes. Groupings rarely stay the same for more than part of a day. In one case, a female giraffe was observed on 800 consecu-

tive days and was only found twice in a group that remained the same for twenty-four hours. As Estes remarks, with regard to herd structure and composition, “variability is the only rule” (Estes 1991, p. 204).

Even within the momentary grouping, giraffes tend to keep physical distance from each other, remaining within eyesight but often not closer than twenty feet apart. They overcome these distances when feeding together from the same trees or shrubs. Under these circumstances one can see giraffes closely grouped, although rarely touching each other.

As we might expect, vision plays an important role in communication between giraffes:

Staring seems to be a favorite form of giraffe communication. There are what look to human observers like hostile stares, come-hither stares, go-away stares, there’s-an-enemy stares. When giraffes spot lions in the grass, a steadfast gaze alerts dozens of other giraffes that may be scattered over a square mile of savanna. Giraffe mothers stare at other adults to warn them away from calves. (Stevens 1993, p. 10)

The dominant role of vision goes hand-in-hand with a reduction in importance of the sense of smell, which is so important in most other mammals:

The sense of smell recedes in importance and is limited to scents in rising air currents.... The unique body of the giraffe causes the sense of smell to play such a small role. Scent-marking of territory falls away...[and] scent glands are lacking. Extensive visual communication compensates the lack of olfactory communication. Tail movements serve as signals. (Krumbiegel 1971, p. 52)

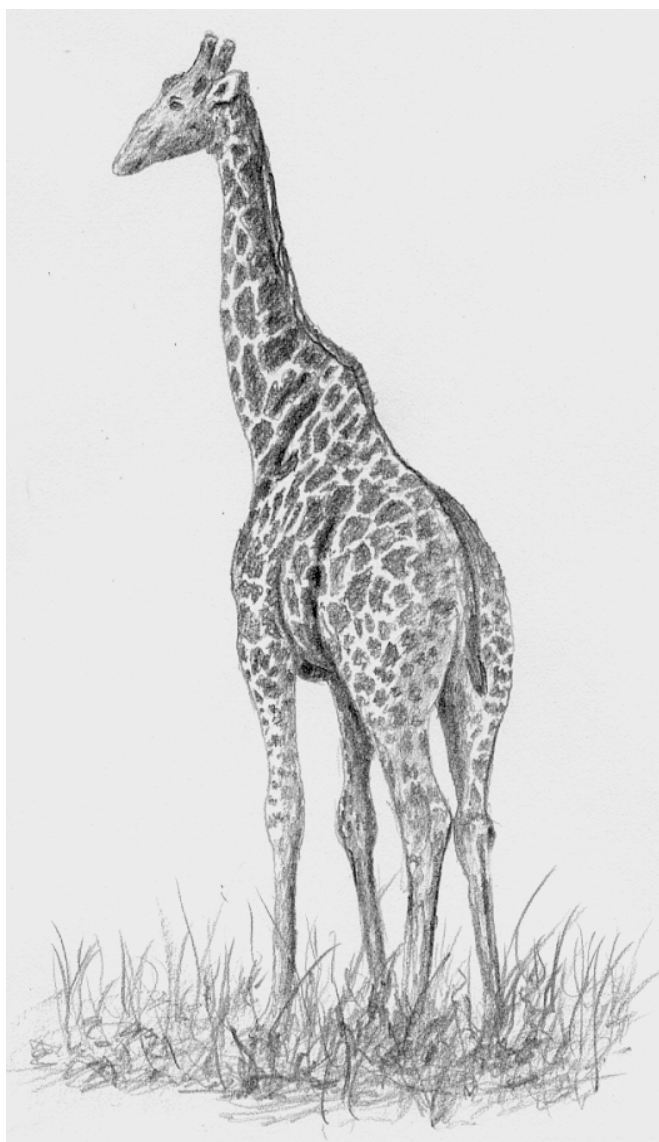
With its body high off the ground and the head resting even further up on the long neck, the giraffe distances itself from the rich world of smells near the ground, a world in which most other mammals are immersed. It is a telling fact that the end of the giraffe’s nose and muzzle is dry in contrast to the moist nose and muzzle of most other ruminants.

Touching and rubbing are also not typical forms of giraffe social behavior. They occur usually only between cow and calf, between “necking” males (see above), and before and during mating. Otherwise giraffes prefer distance. You don’t see giraffes lounging around with necks resting on the backs of fellow herd members—a typical sight among zebras.

It is interesting in this connection that giraffes rarely drink. I have discussed (Holdrege 2003) their awkward

manner of splaying their forelegs to reach down to drink water, as if their ungainly posture were telling us about their lack of need for drinking. (Giraffes take in substantial amounts of water from the leaves and shoots they browse.) Giraffes also do not bathe in watering holes or rivers and rarely swim. If you picture the giraffe immersed in water, with its high center of gravity, it’s hard to imagine how it could keep its balance. The giraffe’s gestalt is definitely not adapted to life in water!

The quiet, sensitive aloofness of the giraffe stands out more when we think, by way of contrast, of the elephant. Elephants live in tightly bonded family groups in which the members are in close physical contact. They rub up against each other and caress and slap each other with their trunks. They are continually pulling in the scents of their



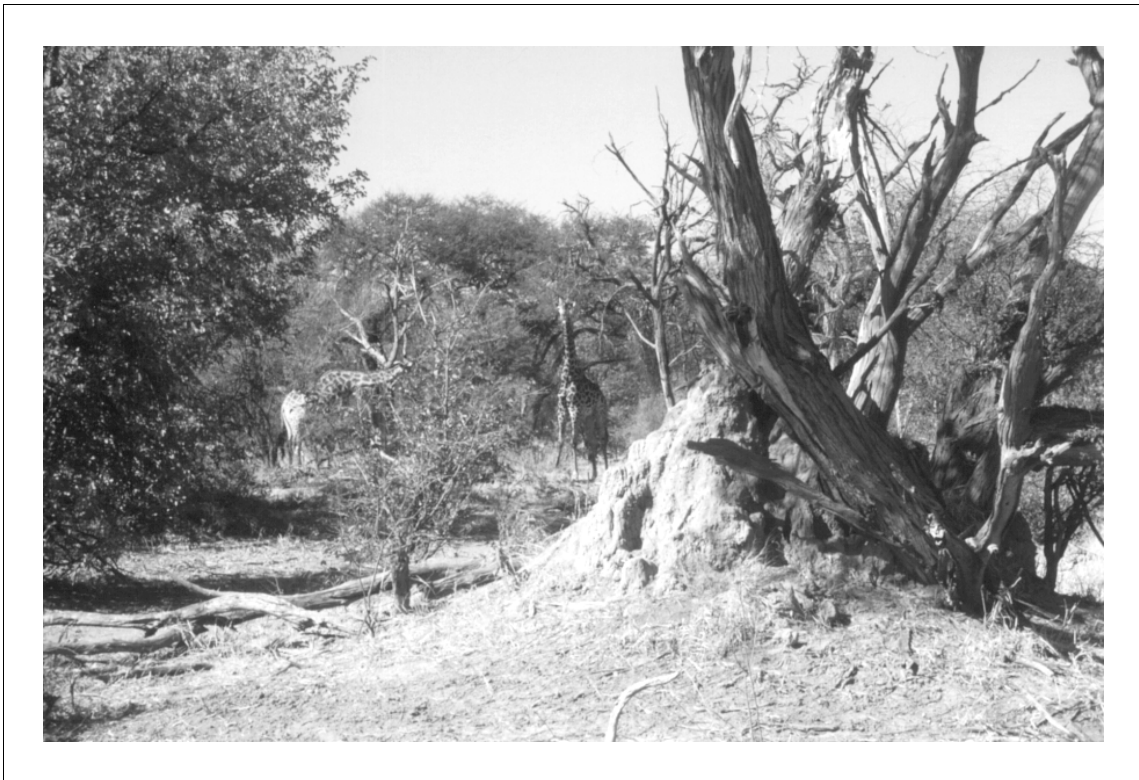
A lone male giraffe in Botswana. Note that the tail is missing its long hairs, which the giraffe probably lost when its tail was grabbed by a lion. (Drawing: Craig Holdrege)

surroundings through their trunks. An elephant will smell you before it sees you; its eyes are definitely not its dominant gateway to its surroundings. Elephants also love water and, when they can, bathe every day. Elephants are about contact and immersion; giraffes maintain more distance. Although giraffes and elephants often inhabit the same area, qualitatively they live in very different worlds.

In my forthcoming monograph on the holistic biology of the giraffe, I will complete this portrayal of the giraffe by discussing in detail its peculiar morphology, its feeding ecology, and patterns within the evolution of the giraffe family.

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(Photo: Craig Holdrege)