

Prologue

Many of us grow up now with romantic notions about cactus-studded landscapes lit by neon sunsets, notions some scholars think may be the emerging landscape stereotype of the American West in the eyes of the world. But of course you know in your heart that the desert aesthetic must be a very recently acquired taste, for its opposite—a revulsion and even fear at its barrenness and screaming heat—flirts about the edges of the mind.

Dan Flores, *Horizontal Yellow*, 1999

 I have devoted much of my career to studying mammals in deserts, investigating how they adapt to aridity, how they come together to form complex communities of organisms, and how they manage to exist in habitats of such singular starkness. Most people, however, associate the word “desert,” whose Latin root is *deserare*, meaning abandoned, with a place that is barren—a wasteland, an area of magnificent desolation, harsh to all forms of life, especially human beings. And indeed every year people perish in the desert when caught unprepared for life in a hot, arid place. They have car trouble or get lost, having entered the desert with little or no water. They were unaware that in the desert the human organism requires 2 gallons of water each day to remain in water and temperature balance.

With too little water people perspire to maintain body temperature, but as water is lost blood thickens and salt levels in the tissues diminish. When salt and water levels are reduced, the body stops sweating, thereby reducing wa-

ter loss, but increasing body temperature. If salt and water are not consumed, heatstroke, perhaps hallucinations, and death soon occur. The careless traveler who enters the desert with insufficient water and little or no salt becomes one with the desert, a choice bit of food and water for those many organisms—from the tiniest desert shrew to the African lion—that, through their remarkable array of behavioral, physiological, and ecological adaptations, do not find the desert particularly challenging.



If you are a field biologist working alone at a remote desert site there is no one to tell when or where you will be at some particular point, for you may be gone for weeks or months. As Clint Eastwood said, one has to know one's limitations. Cars break down. Accidents happen. Falls occur; legs are broken. Venomous snakes are a small but ever present danger, and in some areas even killer bees may pose a risk.

Many things can go wrong on a field trip across the desert, and the more remote the study area the greater the danger. Some bad things that can happen cannot be foreseen. But one thing a desert biologist knows: water and salt are the most important things to take into the desert. You can survive without food for up to a month, but without water you can live for only a very few days. The length of a field trip is often determined by water limitations, not by the amount of food or fuel remaining. Push the limits on water in a desert and you push the limits on life.

Clearly, deserts pose great challenges to people who enter them. Yet deserts have always been a part of humanity. Humans are not a species of the verdant jungle. We developed our most human characteristics in a dry savanna only marginally more luxuriant than a desert. It is the need to organize families, tribes, and societies in the face of an unpredictable environment that helped form societal structures over the millennia. The Egyptians of Pharaonic times were a desert people subsisting along the green thread of the Nile within the vast Sahara Desert. Though the Nile supplied water for them and their crops and animals, it was the desert that made them reach beyond the verdant valley toward other lands, and it was the desert that sup-



Broad vista across the Negev Desert, Israel, where Moses and the Israelites wandered for forty years. (Photo by M. A. Mares.)

plied the minerals and other materials the Egyptians needed to create a great civilization.

Deserts, with their clear air and limitless vistas, taught people to organize, for desert survival requires organization. Indeed, the harsh surrounding desert that placed a limit on the green oases of life may have permitted the growth of dense human populations within the circumscribed area of the Fertile Crescent. Increased population density may well have been necessary for the rise of civilization. Humanity's first system of codified laws also was created in the Cradle of Civilization—the valley of the Tigris and Euphrates

rivers—where agriculture first was practiced in a semiarid habitat. Water, the *sine qua non* of desert life, was in short supply, and people struggled to devise fair ways of using this life-giving liquid. Crops, lives—civilization itself—depended on agriculture, which depended on water.

The spirit of the desert is set deep within the fiber of our being as a species. Yet although deserts made us what we are today, we have escaped those early xeric connections. We worry less about the unpredictable ways of nature than we did when we were peoples of the parched land. We no longer understand the stark, spare landscape of the desert.

But despite the popular view of the desert as a lifeless wilderness, and despite our own fragile ability to exist in an arid climate, life in the desert is, in fact, rich and mysterious, varied and complex. Landscapes that seem to harbor few organisms can suddenly burst forth with flowers within days of a rain shower. Dry waterholes can fill with shrimp and frogs overnight following a thunderstorm. A panorama of barren, burning dunes during the day can when darkness falls become a dramatic stage for predator and prey, as beetles, lizards, rodents, snakes, armadillos, marsupials, and even lions and elephants move across sand cooled by the desert night. As the sun rises, the life-filled desert again assumes the guise of a forbidding landscape, its many species awaiting the passing of the day.