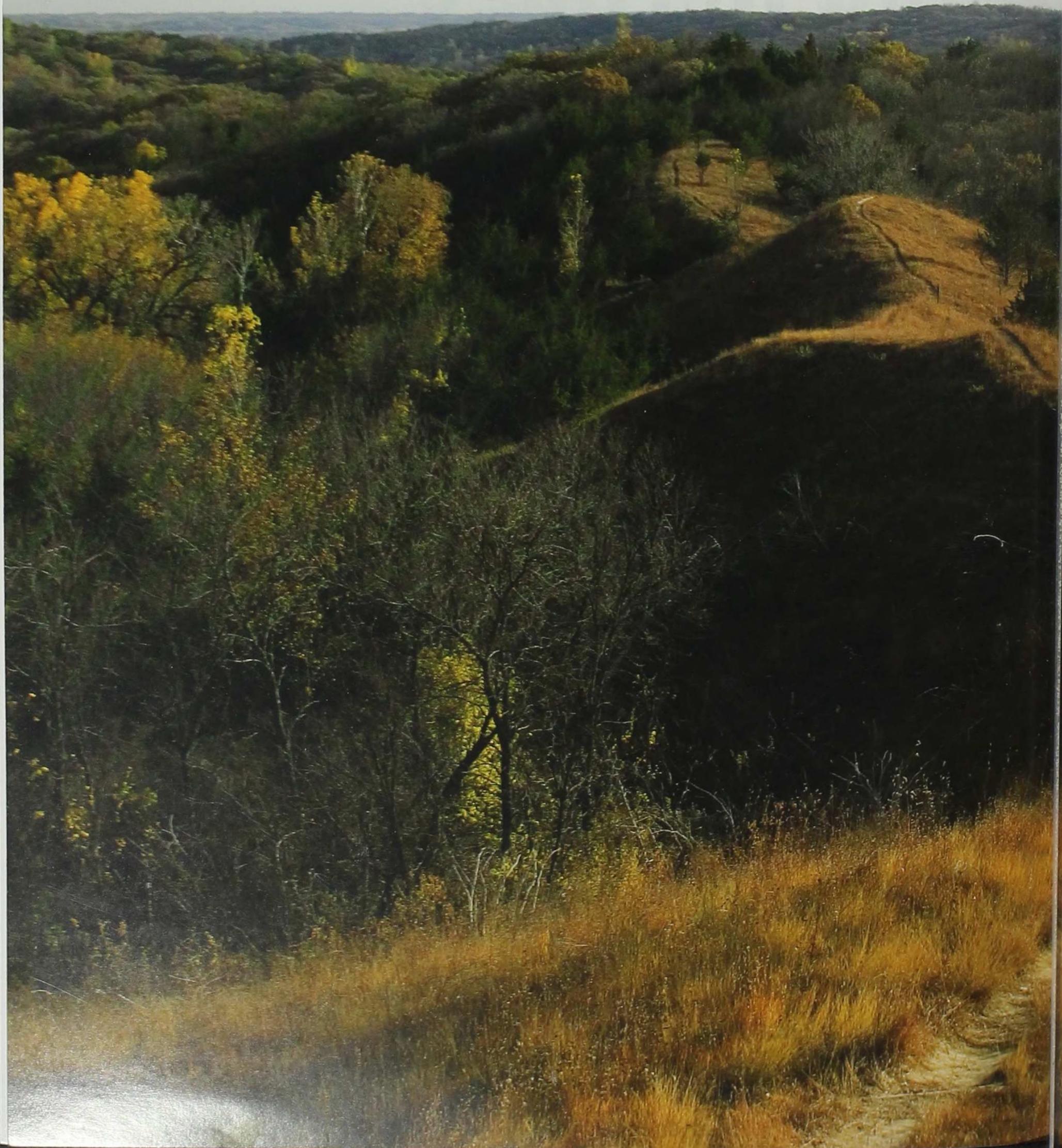
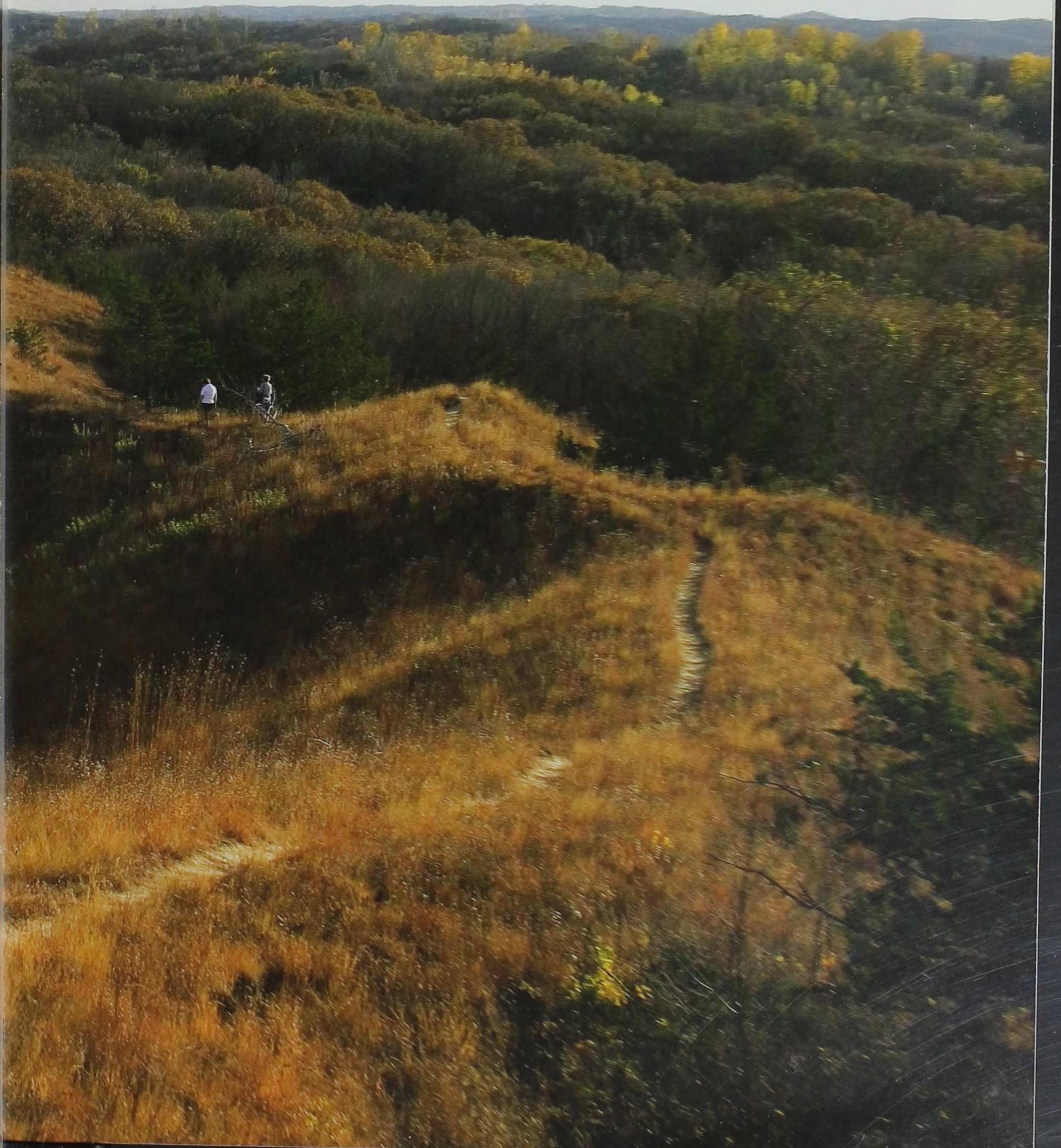


The Loess Hills

A Century of Change



text and photos by Stan Buman



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Looking south towards Hamburg, in the southwestern corner of Iowa. Photo above by Bohumil Shimek (early 1900s); below, by Stan Buman, author of this article (2006). The comparison shows the encroachment of trees, shrubs, and other woody plants.



It was a long, hard scramble through the brush to get to the grass-capped ridge. Once on top, I rested and let the breeze dry my shirt and cool me down.

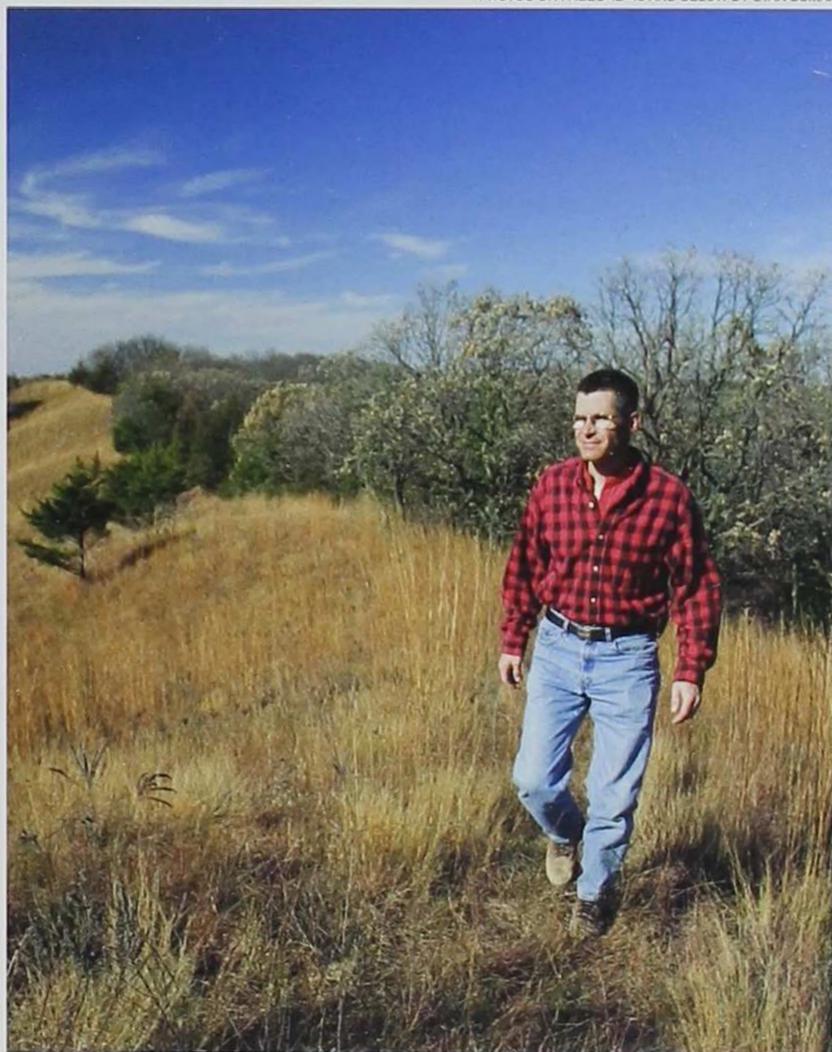
My goal was to locate the same spot where Iowa botanist Bohumil Shimek had stood with his camera in the early 1900s. In my hand I held a black-and-white print of the photograph he took that day (*top left*).

I moved up and down the ridgeline, peering through openings, trying to match the patterns of the distant hills with those in Shimek's photo. I had to contend with a century of change here in Iowa's Loess Hills. My task was complicated by the woody vegetation that had invaded the hills and now blocked my view. Only through narrow openings in the trees and brush could I glimpse small pockets of prairie remnants.

I ended up compromising on the exact location. Otherwise my photo would show nothing but a wall of trees.

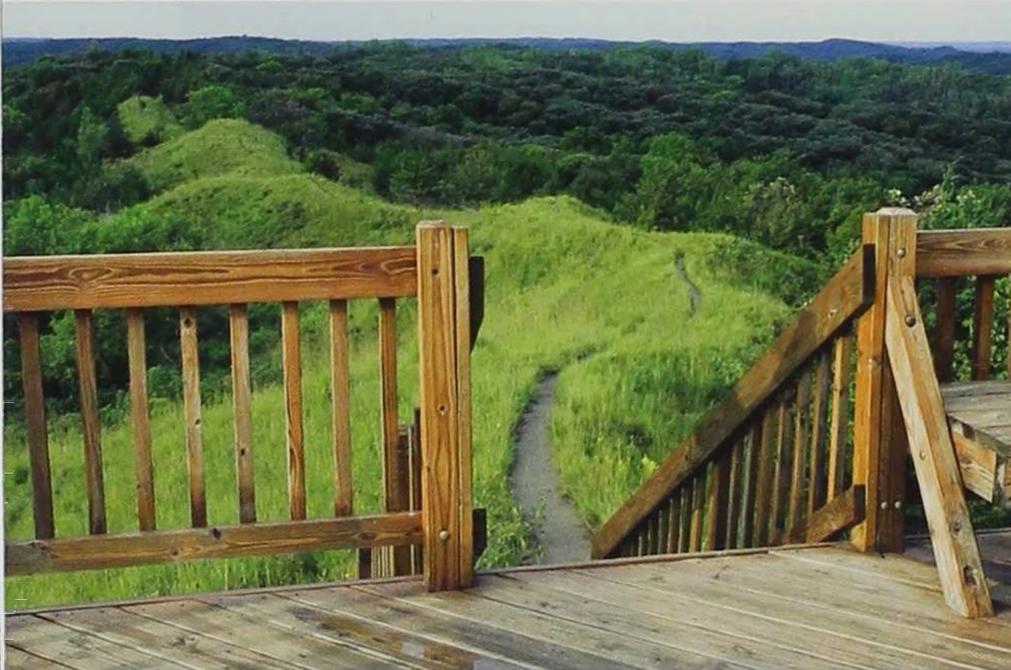
Shimek, on the other hand, had captured a vast, open scene of prairie spread over the Loess Hills, with only a few scattered trees. It must have been a spectacular

PHOTOS ON PAGES 42-43 AND BELOW BY STAN BUMAN



Author and photographer Stan Buman hikes in the Loess Hills.

PHOTO BY STAN BUMAN



Hiking and biking trails, scenic overlooks, and educational opportunities are keys to enjoying and appreciating the Loess Hills and understanding the need for conservation. Right: yucca thrives on the steep, dry slopes. The hills arise abruptly from the broad Missouri River valley.

scene: native grasses waving in the wind, yucca clinging to the dry, steep slopes, and seasonal wildflowers in bloom—all of this extending for miles in a north-south direction.

The geographic region called the Loess Hills stretches from Plymouth County in the northwest corner of Iowa, all the way south into Missouri. Never very wide, this unique landform is contained within the column of counties parallel to the Missouri River valley, the same valley responsible for the formation of the hills.

To understand how the Loess Hills developed, think back to the last several glacial periods, 12,500–150,000 years ago. As the glaciers advanced from the north, they ground up the underlying rock into a very fine, powdery sediment.

During warm periods, the melting glaciers sent large volumes of water laden with this fine sediment downstream. The sediment was eventually deposited on the expansive Missouri River floodplain, leaving large exposed mudflats across the river valley.

As the meltwaters receded, the prevailing westerly winds picked up the fine soil particles and deposited them along the eastern side of the floodplain. Over thousands of years, these wind-blown soil particles, called loess (*luss*), accumulated and formed hills. Just imagine the dust storms, carrying the loess for miles and depositing it in

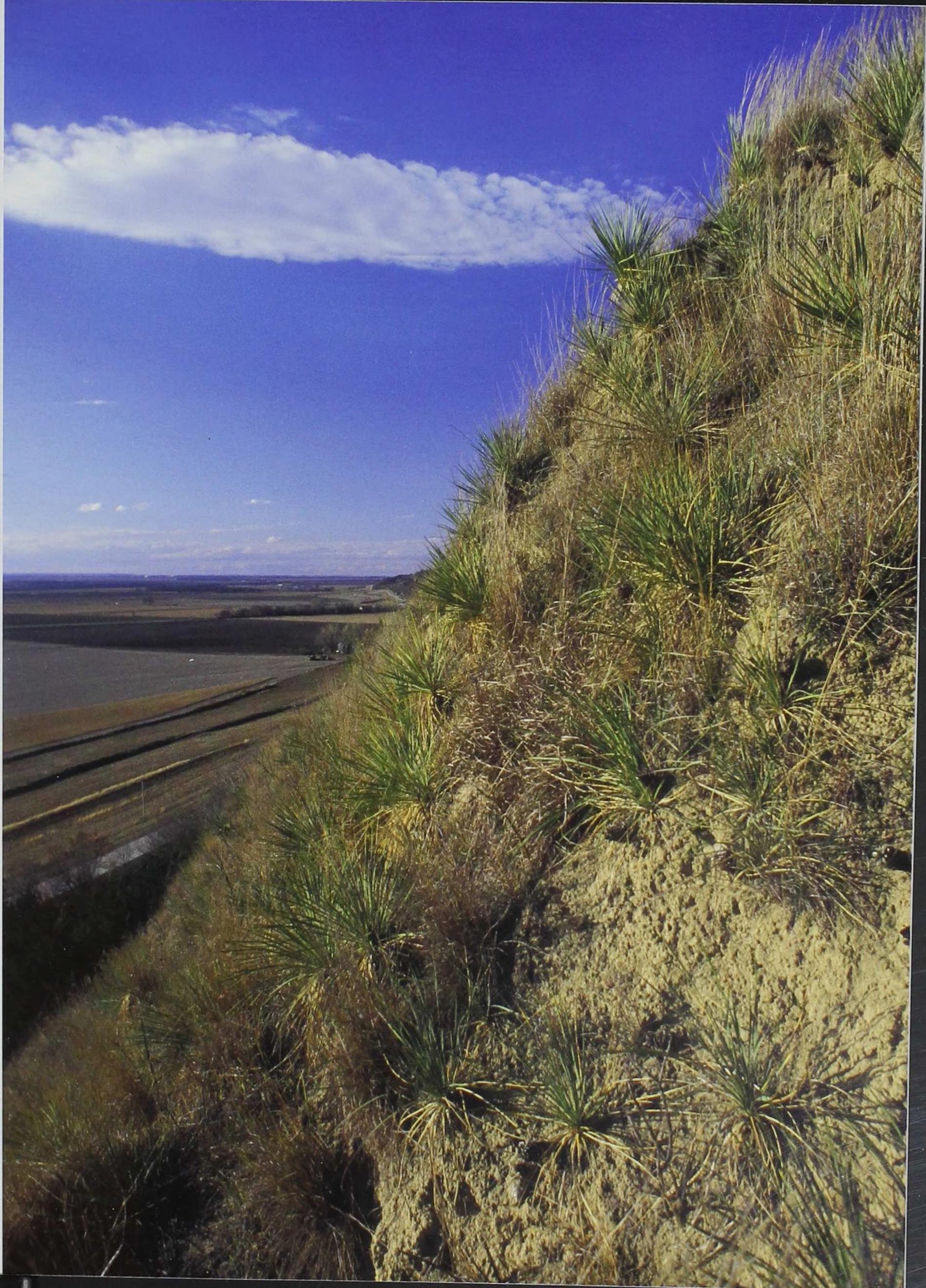


PHOTO BY STAN BUJMAN



PHOTO BY STAN BUMAN

formations like enormous sand dunes, some higher than 200 feet.

For the past 12,000 years, even as wind was resculpting the hills, water was recarving them. Erosion has continued to shape the landform into its present-day appearance.

The heavier, coarser particles that formed the Loess Hills are fairly homogeneous in size and contain very little clay. Without clay to act as a binding agent, loess soils are more susceptible to erosion, especially when disturbed.

If left undisturbed, however, the soil particles are cohesive. Road cuts used in most of Iowa are V-shaped to maintain their stability, but in contrast, nearly vertical road cuts in the Loess Hills are surprisingly stable. Of course, the loess may slough off when the toe of the road cut is disturbed or during long wet periods.

Loess soil is highly permeable. Water percolates through the soil rapidly, and little moisture is retained for plant growth. Drought-tolerant plant species, however, established themselves in these dry soils, their deep, fibrous root systems providing access to the limited moisture. Typical drought-tolerant grasses found in the Loess

Pasqueflower blooms in early spring. Though it appears delicate, it can handle the dry conditions of the Loess Hills and, here, the chill of ice crystals.



Looking north of Grant Center in Monona County. Photo above by Shimek (1908); below, by Buman (2006).





Looking south from Pisgah (between Sioux City and Council Bluffs). Photo above by Shimek (c. 1908); below, by Buman (2006).



Hills include little bluestem and side-oats grama, while drought-tolerant forbs such as pasqueflower, puccoon, skeleton weed, and coneflower add splashes of color. Yucca, found along the front slope, is at the eastern end of its range.

Fire also played a role in establishing prairie species. During droughts, fire swept up the dry hillsides, fostering species that are adapted to fire and flourish after they are burned. Most woody vegetation, on the other hand, did not tolerate frequent burns and did not survive.

The bur oak was an exception because its thick, corky bark tolerates fire. In fact, scrubby bur oaks frequented many prairies. Other woody species were restricted to the cooler, wetter northeastern slopes that were less prone to fire. But overall, prairie plants dominated the Loess Hills.

The likelihood of wildfires decreased as fields were cultivated, pastures grazed, and roads built. Without wildfires, the delicate balance between prairie plants and woody vegetation shifted. Scattered trees established themselves, even on the drier slopes. Over time, the trees became denser, shading the ground and reducing the fine fuels, resulting in even less fire activity. Although trees and shrubs encroached slowly in the Loess Hills, comparing Shimek's photos with mine reveals the astonishing transformation.

Today, many Iowans hunger



Big bluestem is one of several native prairie grasses that thrive in the Loess Hills. The narrow terraces in the background are called catsteps and appear on the steepest slopes, as a result of the soil slipping and shearing off vertically.



Shrubs and trees, such as cedar and sumac, are suppressed by controlled burning and goats, relinquishing space for prairie species like the unusual fern called moonwort (below).



BOTH PHOTOS BY STAN BUMAN

for the vast prairie-scapes that once characterized the Loess Hills. Land managers, conservationists, naturalists, landowners, and volunteers are undertaking projects to battle woody vegetation, using tree-clearing machines, chainsaws, prescribed fires, and even goats, whose browsing discourages shrubs and small trees.

In turn, prairie plants that somehow had eked out a meager existence under dense shade are multiplying. These forgiving species are reclaiming their former territory—the Loess Hills prairie that naturalist Bohumil Shimek photographed a century ago. ❖

Stan Buman (Fenceline Photos) photographs wildlife and nature for national and regional magazines, museums, and nature centers. He is also part owner of Agren, Inc., a consulting company in Carroll, Iowa, that focuses on making a positive impact on both agriculture and the environment.

The color photos in this article are by Buman. The black-and-white historical photos are from the Shimek Photograph Collection, Departments of Geoscience and Biological Sciences, University of Iowa.

PHOTO BY STAN BUMAN







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