

A Layered History of the Land

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Place transcends perception. Our awareness merely skims the surface of what we can see and touch—hill and valley, field and tree, sky and ridge. Our impressions are of form and color, of the relationship between space and object—the elements of visual beauty that surround us. Yet the reality of place lies deeper. The vine senses this naturally, extending its roots to gather moisture and nutrients from soil and rock. But place also transcends the reach of the vine even as the vine expresses, however cryptically, the long, deep history of the land that feeds it.

In Napa Valley, the bounding ranges embrace a broad sweep of land graced with gentle colors and forms that are unique to it. Napa Valley wines are equally distinctive, with an extraordinary depth, intensity, and power that reflect the near-ideal winegrowing conditions this small valley provides. These wines echo as well something of the valley's history, which lies hidden in layers beneath the surface, there for the unearthing. As the late geologist/winemaker David Jones so vividly put it, in a bottle of Napa wine you are “tasting a hundred million years of Earth history.” The person who comprehends something of that history, who recognizes the epic of the land, brings to viticulture,

winemaking, and wine appreciation an understanding that informs every decision, action, and moment of pleasure.

One hundred million years ago, the land of Harlan Estate did not exist. At that time, the coast of North America lay far to the east over an ocean floor that was sliding slowly beneath the continent, driven by the inexorable power of moving tectonic plates. From about 145 million years ago to 60 million years ago, soft sea-floor sediments and chunks of hard ocean crust plastered themselves onto the edge of the continent, assembling a group of rocks called the Franciscan Melange. These rocks now lie at and beneath the surface of the land throughout much of the northern California coast ranges. Inland, a string of volcanoes, precursors to the Sierra Nevada, shed sediments into what we know today as the San Joaquin Valley, then a trough that slowly filled with some 50,000 feet of sandstone and shale that geologists have named the Great Valley sequence.

A gap in the rock record that spans the next 52 million years (more or less) reflects an extended time of stability and quiescence in the Napa region. Then, 8 million years ago, volcanic eruptions rent the air, lava spewed forth from linear

vents, and clouds of volcanic dust and ash settled atop the rocks of the Franciscan Melange and Great Valley sequence. Over the next 5 million years the eruptions continued periodically, blanketing several hundred square miles of subdued topography with a few thousand feet of the diverse assemblage of volcanic rocks referred to in this essay as the Napa Volcanics.

The formation of the Napa Volcanics, though, was not the final geologic event that led, eventually, to the land of Harlan Estate. The San Andreas Fault was born near Los Angeles some 25 million years ago. As the fault slowly extended up the coast, it unleashed a series of periodic volcanic eruptions, the latest resulting in the Napa Volcanics. The San Andreas is a transform fault, one in which the sides slide horizontally past one another in a way that is not always purely linear. Sometimes the two sides move a bit apart, creating tension. Sometimes they come together, creating compression. Each motion generates a new set of forces within the upper part of the earth's crust. In Napa, as the sides of the fault moved toward one another, compressive forces cracked the crust, stacking layers of rock much like a deck of cards, to form the Vaca Mountains on Napa's eastern border. Later, continued compression and a new geometry of crustal movement created an upwarp in the crust that formed the Mayacamas Mountains.

Harlan Estate is different from any other estate in Napa Valley, and from any other place in the world. It lies on the lower slopes of the Mayacamas, between the alluvial fans at the base of the hills and the crest of the range, on land with unique attributes of topography and geology. Developed in two separate segments—a small ridge, and the adjacent mountain slopes across a narrow valley—the vineyards lie on distinctly different types of bedrock and face all directions of the compass, an unusual array of solar aspect for an estate vineyard. They occupy elevations between 325 and 550 feet—a characteristic of land that seems, throughout the world's premier winegrowing regions, to produce great wine. In the Napa hills, such land suitable for cultivation is rare, limited by slopes that tend to be too steep, too rocky, or too unstable to develop. Unlike the agriculturally ideal Napa Valley floor, where plant roots easily penetrate the soft and loose sediments washed down from the surrounding hills, the slopes above have only a thin covering of

soil to mantle the bedrock. Harlan's vines commonly take root in less than a foot of soil, often just a few inches, before fighting to infiltrate first decaying and then fresh bedrock along cracks and fissures. Exceptionally well drained, the broken and fractured rock forces the vine roots to struggle not only for space but for moisture as well, an effort that many winegrowers think benefits the vines and leads to grapes of superior quality and character.

The two segments of the estate—the ridge to the east and the main mountain slope to the west—are geologically distinct. The narrow valley separating the ridge from the main mountain mass developed on a geologic fault that provided a line of weakness for stream erosion. Geology separates the two segments of the estate in other ways as well. Where rocks that once lay flat bow upward, as they do in the Mayacamas Mountains, the youngest rocks lie on the outside of the fold and the oldest in the interior. In the southern portion of the range, where Harlan Estate lies, rocks of the Napa Volcanics form a thin veneer on the outer, lower edges of the mountains, with sandstone and shale of the Great Valley sequence forming the core. At the estate, vineyards on the mountain slopes grow primarily on sandstones of the Great Valley, while those on the ridge to the east are rooted, however precariously, in rocks of the Napa Volcanics.

The Great Valley sandstones, on the western hillside, are fine-grained rocks deposited by muddy slurries that swept down the slopes of the basin as undersea landslides and accumulated in several thousand feet of water. The tiny grains of quartz and feldspar that make up these rocks are held together by a calcium carbonate "cement." As this material dissolves during soil formation, the freed particles form sandy soils that provide a loose and well-drained substrate for vines. These western vineyard blocks are quite uniform overall, but the southernmost vines root in landslide debris that contains a small component of weathered volcanic pebbles and cobbles. Two patches of volcanic material that slipped in along a small fault, perhaps an offshoot of the larger one that runs along the adjacent valley, punctuate the northern blocks.

Harlan Estate vines planted on the eastern ridge grow on Napa Volcanics, a more diverse group of rocks than their name

implies. Red-hot, viscous lava, when cooled, becomes a tough fine-grained rock, resistant to weathering and erosion but also brittle and prone to fracture. Dusty volcanic ash, propelled violently from cracks in the surface, settles back to earth to form tuff, a soft rock that weathers to clay. If the ash is hot enough, thick accumulations re-melt and then cool to form welded tuff, a material almost as hard and resistant as flow rock.

The eastern blocks of Harlan Estate grow atop fractured flow rock with a few significant areas of tuff. The difference between the two is marked. On the hard and resistant flow rock, a few inches of loose material lie on decaying bedrock, which, in turn, grades into fresh bedrock at depths of a foot or two. Fine vine roots pierce the decayed bedrock and send delicate rootlets into the fresh parent material, but most root growth occurs in the thin, loose surface sediment. More highly decomposed, with sandy debris extending to depths of six feet or more, the tuffs provide a soft and loose substrate easily penetrated by vine roots. Similar in texture to the sandy surface materials that develop on the Great Valley sandstones, these weathered tuffs might well have originated as volcanic ash that was shifted and worked by water in streams and lakes after it settled from the skies.

From a more general perspective, the two segments of Harlan Estate—east and west—can be seen as opposites. The volcanic rocks of the eastern blocks are hard and young, and the Great Valley sandstones are soft and old. The incandescent lava and explosive ash of the Napa Volcanics embody the ancient Greek cosmic elements of fire and air, while the materials of the Great Valley sandstones—wrested from the land and delivered to the sea—represent earth and water. Yet, as is often the case with opposites, each contains within itself seeds of the other. In those blocks dominated by Great Valley rocks we find

patches and pebbles of volcanic elements, while the blocks underlaid by Napa Volcanics contain segments of weathered tuff similar in texture to weathered Great Valley sandstone. Perhaps this mix of geologic components and classical cosmic elements contributes its own nuance to the distinctive character and quality of the Harlan Estate wines. Despite modern technology, wine still embraces mystery.

As a span of time, a hundred million years of Earth evolution might seem unimaginable, and it is surely meaningless within the context of a human lifetime. But consider the nested nature of these numbers: millions of years to create the foundation, thousands of years to form the soil, hundreds of years to develop modern wine culture, tens of years to establish a mature vineyard, a decade or more for a great wine to reach its potential, four years to make and age a wine produced from a growing season of just a few months. That progression of history is as much a part of the wine as the craftsman who made it, the grower who grew it, or the place in which it was grown. It certainly differentiates the fruit and wine of Harlan Estate.

The mystery and magic of wine continue to challenge all attempts to reduce the process of making it to a set of formulas or the product itself to a set of simple adjectives. We know, however, that the best wine comes from the most carefully chosen and prepared land, farmed with great attention and care, and from a wine ethic that honors the conditions and traditions of the site and the effort made to provide grapes that reflect its character. Awareness of the deep history of the land and its present complex character suggest that the relationship between wine and place is perhaps more tangled than we can ever unravel. Yet this awareness can bring a new appreciation of the ineffable qualities of vines, grapes, and wine, qualities that might well reside forever beyond our analytical grasp.

