

Appeals in the case of *Lebamoff Enterprises, Inc. et al. v. Bruce Rauner, et al. and Wine & Spirit Distribution of Illinois* overturned a ruling by the U.S. District Court for the Northern District of Illinois that permitted Illinois to prohibit out-of-state retailers from shipping liquor to its residents citing the Dormant Commerce Clause as the basis for the decision. On 26 June 2019 in a seven to two decision, the U.S. Supreme Court in the case of *Tennessee Wine and Spirits Retailers Association v. Clayton Byrd* held that Tennessee's two-year residency requirement for out-of-state residents to obtain a retail liquor license violated the Dormant Commerce Clause and was not saved by the 21st Amendment.

Part Five (Chapters 34 to 38) is a collection of "several miscellaneous laws about wine that we just did not feel belonged in the other parts of this book" (p. 163).

This self-published paperback, while certainly a worthwhile read, suffers from a lack of careful editing. There are missing words, too much repetition of ideas, and errors ("chalk full" (p. 125) instead of chock full). While the extensive, mercifully same-page, footnotes cite the primary sources of the regulations, secondary sources, especially *The Oxford Companion to Wine, 4th Edition* by Jancis Robinson et al., are referenced for wine related claims and even for a discussion of the Italian government quality rating system (Chapter 21) where primary sources are available. A list of references or bibliography and an index would have been useful.

Despite its flaws, *Is There Apple Juice in My Wine?* is a breezy account of an inherently ponderous subject that affects all aspects of the U.S. wine industry. For the investment of a few hours and the price of a modest bottle of wine, a reader can enjoy a somewhat frothy, opinionated, but well-informed overview of the regulations behind many of the controversies still raging and gain insight into what may actually be in that bottle of Napa Valley Cabernet Sauvignon.

Neal D. Hulkower
McMinnville, OR
nhulkower@yahoo.com
doi:10.1017/jwe.2019.18

ALEX MALTMAN: *Vineyards, Rocks, & Soils: The Wine Lover's Guide to Geology*. Oxford University Press, New York, NY, 2018, 256 pp., ISBN: 978-0190863289 (hardback), \$34.95.

Ever since I read Maltman's papers (Maltman, 2013a, 2013b), I bristle when I hear the term "minerality" used in a description of a wine. Geologic¹ minerals have no smell or taste, he insists. How incredibly naïve it is, then, to think that a wine is a

¹ We adopt Maltman's convention of using "geologic," what he calls the American convention, for tangible things and "geological" for mental constructs like time.

medium for transporting flavors from the land in which the vines that grew the grapes are planted. After all, when we smell flowers or taste berries in a wine, we know it is not because it contains them. But as others acknowledge: “Although many tasting terms are metaphorical..., there is a strong temptation to interpret ‘mineral’ rather more literally...” (Robinson, 2015, p. 465). Of course, not doing so could undermine a fundamental tenet of terroirists. Since the beginning of this century, “minerality” and “mineral” appear ubiquitously in wine writing. Maltman claims that “apparently it has now become the most widely used taste descriptor” (p. 176). To me, it comes across as a vinous verbal tick that signals an indolent vagueness wrapped around a desire to flaunt a tuned-in palate. At times, I requested more specificity from visitors to a tasting room where I worked when they claimed to have detected minerality, then sought validation from me, which, of course, I never gave. So I was amused and humbled as I was preparing this review when I read a tasting note that I had written while sampling a 1967 Chablis Grand Cru Vaudésir from Domaine Mary Drouhin in 1976: “Taste very flint and earth (sic)...Very earthy, minerally finish” (Hulkower, 1976). Oh, the irony! What was I thinking? Or more precisely, since I was still a novice, who or what was I channeling? The pervasive tasting-note meme clearly has its roots going back many decades.

Since a long-practiced habit dies hard, a strong jolt is required to dislodge it. Maltman’s excellent book is intended to be just that. The retired Professor of Earth Sciences at Aberystwyth University in Wales and amateur vigneron deploys his formidable twin-pronged knowledge and pedagogical prowess in this volume aimed specifically at wine professionals, especially those who are perpetuating the myth of minerality in their writing. So ingrained is the idea that we can taste minerals in wine that numerous labels include the names of or references to rocks, minerals, and land features. In the Preface, Maltman advises: “...these days it’s almost obligatory in the wine world to know something about the geology of wine-producing areas and of particular vineyards” (p. xi). But he cautions: “...geology is a highly conceptual subject and not easy to pick up quickly” (p. xi). So will those who are too lazy to be more precise in their descriptions be too lazy to read this challenging work? One hopes that they are as receptive to Maltman’s message as the celebrated British wine writer Andrew Jefford who in the Foreword states: “...he is a scientist – and wine lover – with an open and enquiring mind who merely asks that we should understand what the technical terms mean before we use them and that we respect the journey toward understanding which science has so far permitted us” (p. x).

In the 12 chapters comprising the book, Maltman’s approach is to teach geology literally from below the ground up, starting at the atomic level with the elements (Chapter 1) that build the minerals (Chapters 2 and 3) that make the rocks (Chapter 4 to 8) that weather and erode and mix with biological material, called humus, to make the soil (Chapters 9 and 10). Chapter 11, Vineyards and the Mists of Geological Time, and probably the single most important section for the

intended audience, Chapter 12, Epilogue: So is Vineyard Geology Important for Wine Tasting? complete the lessons.

Maltman reminds us: "...all rocks and soils are made from (geologic) minerals, not some more than others" (p. 173). Throughout the book, Maltman drives home the point that no geologic mineral can be sensed in a wine. For example, regarding slate, which is prevalent in many vineyards, most famously in those on the Mosel and Rhine in Germany, he asserts: "...like most rocks, slate lacks any taste or odor. To have taste, a substance has to dissolve, and manifestly that is not the case with an inert material that makes practicable kitchen countertops and durable roofs" (p. 99).

There is another type of mineral, however, nutrient mineral, and therein lies some of the confusion. In addition to water, a vine only needs sunlight for photosynthesis and essential nutrients to thrive. Maltman explains, "Mycorrhizal fungi living in the soil can extract some [nutrients] directly from geologic minerals and transfer them into the vine's roots but otherwise complex weathering processes and ion exchange have to act to release the elements into the soil's pore water" (p. 167). These nutrients are sometimes called mineral nutrients because they are extracted from the ground. But, he notes, "most nutrition typically comes from the top few tens of centimeters or so of the soil" (p. 167). In particular, "the greater part of the nutrition comes from the organic matter in the soil" (p. 173). The critical process of cation (positive ion) exchange in soil water with the vine roots is masterfully explained in Chapter 2. Vine roots that grow deeper into bedrock are in search of water, not nutrients.

So since vines absorb nutrient but not geologic minerals, can we taste those? Well, for one thing, wines do not have much of them. "In normal wines, mineral nutrients typically comprise less than 0.2%, in total," Maltman informs us (p. 176). Based on studies using water, a far less complex beverage than wine, "[i]t's possible that the tiny amounts can interact to produce some aggregate effect, but, tellingly, tasters report that as the presence of metal ions becomes increasingly detectable, the water becomes more and more disagreeable" (p. 177). He concludes "describing a wine as mineral or possessing minerality should not be referring to actual minerals – geologic or nutrient – but should be recalling some cue, some mental association" (p. 177).

For those willing to face the scientific facts but not all the details, the last chapter is a valuable summary and a firm persistent pushback on popular beliefs regarding the connection between the taste of wine and geology. The flavor of wine is largely created by our senses of smell and taste. Maltman reiterates, "The taste components mainly involve ions and compounds in solution and geologic minerals are practically insoluble" (p. 217). Sodium chloride is an exception and gives a salty taste. But because "growers avoid salt in vineyard soils, and grapevines try to reject sodium...wine normally contains little salt, less than the minimum...most people require to be present *in water* in order to recognize it: a perception of saltiness in wine is usually metaphorical" (p. 217).

What is it then that is creating the impression that we are smelling and tasting rocks? Highly aromatic organic compounds like microorganisms are likely a source. A popular term in wine notes these days is petrichor, the smell of rocks after a rain, which is caused by “the vaporization of certain organic oils (lipids, carotenoid, etc.) ...” (p. 219). Maltman addresses the iodine smell of the ocean in some Chablis and makes the case that any iodine present would be in too small a concentration to be perceptible and “has to be a metaphor and unrelated in any direct way to the actual vineyard geology” (p. 219). Investigations are underway looking at bacteria lodged in the cleavages of minerals as a possible influence on wine, but nothing is clear yet.

Maltman has produced an important work that should give pause to those addicted to glibly tossing around “mineral” or “minerality” when referring to a wine’s smell or taste. Though geology is a hard subject relying on its own sometimes confusing terminology and a bit of chemistry, his explanations, leavened with sly, wry, and even, once in a while, lame humor, as well as numerous charming digressions, are lucid. He draws from his deep and detailed knowledge of vineyards, wines, and wine growing regions around the world to continually relate the geology to the interests of the intended readership. Black and white illustrations mercifully breakup the dense text, but sometimes are not sharp enough to highlight the features of interest. Fortunately, two dozen of them are also included as vivid color plates, albeit without the captions, so flipping back and forth is required. Most chapters conclude with an annotated list of suggested references. A six-page two-column index assists the reader in finding a definition or first mention of a term and is essential in the absence of a glossary.

Despite all of the science refuting the notion of minerality in wine, I still perceive saltiness in a manzanilla or a grower champagne and chalk in a Pouilly-Fuissé. Is it real or is it a metaphor? Who am I going to believe, Maltman or my own palate? In the end, as Maltman, I accept that science must prevail and that eventually it will render these questions false dichotomies.

Neal D. Hulkower
 McMinnville, OR
nhulkower@yahoo.com
 doi:10.1017/jwe.2019.19

References

- Hulkower, N. (1976). Tasting note for 1967 Chablis “Vaudésir.” Unpublished.
- Maltman, A. (2013a). Mineral taste in wine, minerals in the vineyard...Are they connected? *Wines & Vines*, 94(5), 63–70.
- Maltman, A. (2013b). Minerality in wine: A geological perspective. *Journal of Wine Research*, 24(3), 169–181.
- Robinson, J. (ed.) (2015). *The Oxford Companion to Wine, Fourth Edition*. Oxford: Oxford University Press.