

somebody like me who grew up with dry German Riesling, it was a great pleasure to read, but really, anybody interested in the story of dry Riesling will enjoy reading this book.

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MARK A. MATTHEWS: *Terroir and Other Myths of Winegrowing*. University of California Press, Oakland, 2016, 288 pp., ISBN 978-0-520-27695-6 (hardcover), \$34.95.

I immensely enjoyed reading this book, not so much because its author cites one of my articles, but mainly because he quotes Vladimir Nabokov, one of my favorite writers, who starts his *Lolita* with words that could apply to a wine when you taste it: “the tip of the tongue taking a trip of three steps down the palate to tap at three on the teeth.”

The preface sets the scene: “As I gained experience in the world of viticulture, I found that some of the received archetypes were incongruous with elementary crop science. For example, there is a long-standing argument that one cannot both irrigate vines and produce fine wines (yet rain and irrigation water are the same to grapevines)” (pp. ix–x). It is followed by four chapters debunking four false truths: (a) wine quality is determined by low yield and small berries; (b) vine balance is the key to fine wine grapes; (c) there is a critical ripening period, and vines should be stressed; and (d) *terroir* matters. I will try to deal fairly with all these issues, but it will come as no surprise to those who know me a bit if I spend more time on *terroir*.

Professor Matthews argues that these myths are all about getting ripe fruit, but they are no longer needed today, because “we have become skilled in grape growing [that is, more skilled than in the past, when these myths were invented] and in many regions, ripe fruit are generally attained [without relying on mythology].”¹

Matthews is serious and supports his claims with statistical observation and experiments. However, he also knows the difference between correlation and causation (which should please economists), though he suggests that “as long as one can count reliably on one easy observation (yield, for example) to predict another more difficult to resolve phenomenon (fruit and wine quality), vines can be managed accordingly, whether the correlation is causal or not.”

¹ Private correspondence, April 27, 2016.

The first chapter kills the high yield–low quality (HYLQ) and the big bad berry (BBB) false truths. Both in Europe and California, historical data show that good weather, high yields, and quality often come together. Matthews suggests that HYLQ is artificially used to limit production and increase prices, but not to produce better quality: “when limiting the acreage of an appellation was insufficient to secure a decent price, rules grew to also include a crop yield” (pp. 22–24). Matthews and Guinard launched an experiment to test the HYLQ hypothesis (pp. 56–58), changing the yield by using two common practices: pruning and cluster thinning. Irrigation was used in a different experiment with the same Cabernet Sauvignon grapes. They found that these three common practices resulted in different wine sensory profiles under identical yields. For instance, vines pruned to higher yields were less veggy and fruitier, but higher yields produced the inverse result under irrigation conditions. The obvious conclusion is that sensory profiles cannot only be explained by crop load, as the HYLQ myth would have it.

The BBB myth (p. 69) that small berries produce better wines is problematic as well, because the low yields praised in the HYLQ myth produce big berries. Thus, the two myths cannot be true simultaneously (p. 69). The real story is a bit more complicated, but the essential message is that “in the large context of comparing vintages, yield and quality are not mutually opposed in any robust or fundamental way” (p. 22).

In chapter 2, Matthews refers to many meanings that describe *vine balance*, ranging from the aesthetic pleasure when looking at a vineyard (which may indeed change the quality of the wine, especially if you are drunk) to metrics such as ratios of yield/leaf area or yield/pruning weight (Y/PW). I will concentrate briefly on the Y/PW ratio. In a figure on page 103, Matthews shows that for Cabernet Sauvignon (grown in almost all wine regions of the world), the relation between Y/PW (horizontal axis) and wine score (vertical axis) is flat: a wine score between 10 and 15 can be generated by a Y/PW that varies from 2 to 9.5. A “subtle” econometrician who would discard one of the 15 observations as an outlier could even show that the slope is positive, but then, why is this ratio considered attractive and used? Because, Matthews writes, it is “convenient to measure” (p. 112).

What he refers to as the *critical ripening period* in chapter 3 is indeed critical: “the fact that ripening is occurring,” writes the author, “is what justifies the period as critical” (p. 127). Reaching maturity requires more days at low temperatures than at high temperatures (as expected), and early season conditions may be important for the wine, even if the ripening rate remains unaffected (p. 123). In short, no critical ripening period has ever been identified under normal growing conditions (p. 142). *Vine stressing* stems from playing with temperature or light, or reducing the water input, the three conditions needed to grow any plant. Temperature and light are both out of the wine-maker’s control (except at the time of buying his ground). In addition, there now is a growing realization that fine wine can also be produced on irrigated vineyards because vines cannot tell whether they are getting their water from irrigation or from rain. In Australia and California, vines would die without irrigation, and nonirrigation rules

are slowly but surely disappearing throughout the world. What remains true, however, is that the amount of water and the timing are essential (p. 138).

Chapter 4 on the *terroir explanation* is just great. It starts out with a long digression on the history and the various meanings of the word itself, and concludes with a quote by Jean-Antoine Chaptal (1756–1832), a distinguished French chemist and agronomist who “revolutionized the art of wine-making in France.”² Chaptal referred to “the repulsive and very strong and unpleasant taste of *terroir*” (cited by Matthews, p. 162).

Winemaker Krug (1800–1866) genuinely pointed out: “a good wine comes from a good grape, good vats, a good cellar and a gentleman who is able to coordinate.”³ No *terroir* is involved, unless the “gentleman” represents it.

These are two serious departures from the contemporary view supported by Tinlot (2001), a former director general of the Organisation Internationale de la Vigne et du Vin in France: “There is no wine region in our world that does not try to value its vineyards and their output without reference to the character that they inherit from the place where the wine is produced. Consumers who visit producers are particularly sensitive to the beauty of the landscape, to the architecture of the villages and to any other element that belongs to the region of production” (p. 10).

Vines indeed look at the landscape now and then. If they like what they see, they grow properly; if they do not, the wine will be bad. Tinlot adds that, more recently, “there is even a tendency to extend the notion to human factors, such as know-how and traditions of the local population, that are influenced by the natural, social, political and, why not, religious conditions that prevail in the region” (p. 10). Oh, yes, vines also look at God, choosing the exact moment when he shows up in a cloudy sky. This is consistent (or is it inconsistent?) with what Michel Feuilleat, the director of the Institute of Vine and Wine at Université de Bourgogne, reports about the reasons why Burgundy winemakers are not keen on having their *terroir* studied: “They say, ‘You are going to demystify everything. If you start saying a grand cru means such and such a percentage of clay and limestone, such and such a slope and nutrition of the vine—it will lose all its sacredness.’”⁴

Matthews then moves on to the question of whether the flavors in wine come from the soil (pp. 175–185): “Soils do have profound impacts on grapevine growth and fruit development” (p. 184) and need mineral nutrients, but these “have no established contribution to flavor” (p. 180). But then, do flavors really exist? Not according to Weil (2007, p. 137): “Wine words used by critics to convey analogy to fruits, vegetables, minerals, and odors have no value.”

² See https://en.wikipedia.org/wiki/Jean-Antoine_Chaptal.

³ Cited by Krug and Krug (1979).

⁴ Kunzig (1999), cited by Matthews, p. 204.

He also points to economic forces in the use and renaissance of the concept of *terroir* and evokes two instances (pp. 185–191). The first is that after phylloxera destroyed French grapes, they had to be replanted (or grafted) using American grapevines. French winemakers needed to find a good argument to differentiate themselves from America, and thus was French *terroir* reborn, this time, and since Chaptal died in 1832, with a positive connotation. The second instance followed the increase in competition after the Judgment of Paris,⁵ in which Californian wines came out better than French wines. Patriotism is now also part of *terroir*.

Matt Kramer, who also wrote a review of the book, claims⁶ that “when scientists assert there’s no evidence of *terroir*, Matt Kramer says the proof is on the palate.” Much has been written on the palate that shows that blind as well as nonblind tastings are close to, if not complete, “bullshit,” in Frankfurt’s sense. Several articles in the *Journal of Wine Economics* have debunked the myth of wine tasting as well. Hodgson (2009a) analyzes the results of 13 blind-tasting wine competitions including 4,167 wines, of which 375 were tasted in at least 5 competitions. Judgments were so inconsistent that a statistical test carried out using the 375 often-tasted wines shows that those that received gold medals could also have been chosen randomly. Cardebat and Paroissien (2015) study the correlations between the grades given to a common set of wines including 15 vintages (2000–2014) by 12 famous experts.⁷ The average coefficient of correlation between pairs of judges over the whole period is 0.60, but it may get quite small between some pairs (0.14 between Robinson and Galloni). Hodgson (2008, 2009b, p. 241) shows that judges not only disagree but are also inconsistent: often, a judge cannot repeat his or her scores on identical wines. However, this, Kramer will certainly argue, is science and not tasting: it is the palate that matters.

Let me conclude by praising the book. It is beautiful, useful, serious, and also highly entertaining, especially the parts on the history of wine myths, but (there must always be a *but*) it is not always easy to understand by economists who, like me, know little about wine growing but still love wine.

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⁵ See Taber (2005) for details and G.M. Taber, “The Judgment of Princeton,” *Journal of Wine Economics*, 7(2), 143–151 (2012).

⁶ M. Kramer, “It’s All Just Myths, You See?” *Wine Spectator*, April 19, 2016, <http://www.winespectator.com/webfeature/show/id/53034>.

⁷ Michel Bettane and Thierry Desseauve, Jacques Dupont, Antonio Galloni, Jeannie Cho Lee, Jeff Leve, Neal Martin, Robert Parker, Jancis Robinson, James Suckling, *Decanter*, *Revue des Vins de France*, and *Wine Spectator*.

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J. STEPHEN CASSCLES: *Grapes of the Hudson Valley and Other Cool Climate Regions of the United States and Canada*. Flint Mine Press, Coxsackie, New York, 2015, ISBN 978-0-520-9825208-3-3, \$29.99.

The Hudson Valley is in many ways the birthplace of viticulture in America with a grape-growing history that extends back to the 1600s. Its wine-growing history is full of pioneering efforts in grape cultivation and hybridization. The home of the oldest commercial winery in the United States (Brotherhood Winery, 1839), it is a beautiful and fruitful valley with many similarities to European wine regions, especially those of Germany like the Rhine Valley. With its southern border just 20 miles from the George Washington Bridge, the region is in close proximity to the huge wine market of New York City. It is one of the three major wine-growing regions of New York State, which also includes the Finger Lakes and eastern Long Island. In this book, Casscles succeeds better than any other in describing the many facets of grape growing in the region and how its past can be a guide toward a promising grape-growing and wine-making future largely through close examination of interspecies hybrid grapes and other cool-climate varieties.

The author writes with first-hand knowledge of the grape-growing and wine industry in the Hudson Valley. He has been growing grapes there since the 1970s, meticulously observing and managing many grape varieties. His helpful insights are excellent practical guides for the grape grower of cool-climate grapes. He also has been a winemaker for a commercial winery in the region since 2008. Casscles is a government attorney for the New York State Senate and has authored more than