

Geology and Wine. Retrospect and Prospect

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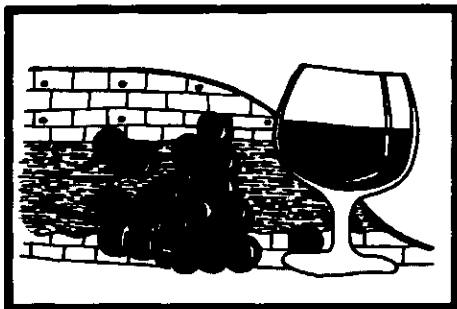
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Geology and Wine Retrospect and Prospect

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Many readers will know of the untimely death of *Geology and Wine* series founder and editor Simon Haynes of cancer on April 6, 2002, and thus the need for a new series editor. At Simon's request, I am continuing the series, unfortunately without anything like the knowledge that Simon had of this subject, but with a willingness and enthusiasm to learn. A change of editor is a good time to look at where we've come from in the series and where we hope to go in future.

Retrospect: Why this series - what's geology *really* got to do with wine, other than the fact that many earth scientists enjoy wine? Simon pointed out in the first paper of the series (Haynes, 1999) that there are five main groups of factors that affect wine grapes during growth: meteorological, physiographic, pedological, geological, and viticultural. Simon also reviewed the French concept of *terroir*. In *terroir*, the French recognize the importance of *all* of these factors, based in part on 2000 years of experience of wine grape growing. Partly

because "terroir" is commonly translated as "soil" in English, there has been controversy over what's important in wine grape growing beyond climate, soil, and the skill of viticulturalists. This brings us back to the question: what has geology - including physiography and bedrock geology - got to do with wine?

The origin of "terroir" also was reviewed in paper 4 of our *Geology and Wine* Series by James Wilson (2001), author of the classic English language book *Terroir: the Role of Geology, Climate and Culture in the Making of French Wines* (Wilson, 1998). Wilson noted that, following publication in the 1940s of the concept of "heat summation" - the sum of the hours when the temperature is above 50 degrees Fahrenheit during the growing season - this was regarded as *the* critical factor in wine quality. One result of the exaggerated importance of this one factor was that most new-world viticulturalists, particularly in California, paid little to no attention to the importance of physiographic, pedological (soil) or geological (bedrock) factors in wine grape growing. Wilson also noted (*ibid.*, 2001) that this view is changing with a younger generation of wine growers, and the exchange of student viticulturists between France and California. He also noted that the whole concept of *terroir* encourages greater recognition of the importance of geology and geological processes, particularly as regards soil, and bedrock, drainage and physiography including siting, in the growth of wine grapes.

Excellent examples of the concept and importance of *terroir* appeared in *Geology and Wine* Series papers 2 (Niagara Peninsula, Ontario; Haynes, 2000), 3 (Walla Valley Appellation, Washington State, U.S.A.; Meinert and Busacca, 2000), and 6 (Red Mountain Appellation, Washington State, U.S.A.;

Meinert and Busacca, 2002). What these three papers do is outline the nature and significance of bedrock geology, overlying soil, and siting (physiographic/geologic) factors in the growing of wine grapes in each of these settings. What these papers *don't* do is to claim that geological factors - soil, bedrock, physiography/siting - outweigh the other factors that lead to the production of quality wines, a claim that is sometimes raised as a critique of the concept of *terroir*. Viticulture, a key part of wine grape growing, involves factors from siting to choice of grape varietal, and management practices including trellising, irrigation, pruning, pest control, etc. Viticultural management practices can strongly affect plant vigour and fruit quality, key factors in successful wine grape production. Indeed the science (and literature) of viticulture is a huge field, not unlike the many fields of geology.

In terms of the relationship between *terroir* and viticultural practices, Larry Meinert says: ".....(W)e have never, ever attributed good quality wine to site alone, although there are cases of bad wine quality for which the site is largely to blame. That being said.... (it) is absolutely right that different management practices can result in better or worse quality wine from a particular site. But the really important question is, what happens when the best possible management practices are applied as appropriate to different sites and the resulting wines differ in quality? This is what we are trying to document in our studies and it is the essence, I think, of *terroir*. Some sites really are better or worse than others. Or phrasing it another way, the best wine that can be produced from some sites really is better or worse than the best wine that can be coaxed from other sites. In both the Walla Walla and

Red Mountain papers we have cited examples of specific sites that have produced great wines and specific sites that "struggle". For the Red Mountain paper we even identified two different end members of "struggle", a vineyard on the floodplain whose rich soils and high water table lead to uncontrolled vigour and a vineyard on basalt outcrop that doesn't retain water. In the first case, there is too much water even with minimal or zero irrigation and in the second case irrigation water drains right through the root zone and, short of hydroponic growing conditions, the plants are stressed (have low vigour). Although best management practice can try to minimize the problems of a site, I don't think any management practice can result in great wine from a terrible site. Similarly, no matter how good the site, poor management or winemaking practices can result in bad wine.

"But our terroir studies are not aimed at understanding terrible sites or bad wines. Rather we have focussed on areas known to have produced great wines and then tried to document the terroir of those sites. In the future we will attempt to make it more clear in our manuscripts that viticultural and enological practice are very important, without losing sight of our main topic which is documenting the effect of terroir." (e-mail to R.W. Macqueen, October 9, 2002).

Paper 5 in the series dealt with another aspect of terroir, the trace element composition of wines and their geological environs in the Okanagan Valley, B.C. (Taylor *et al.*, 2002). There is scope for more studies of this kind, in the Okanagan and elsewhere.

Prospect: Where do we go from here in the *Geology and Wine* series? A forthcoming paper (currently in review) in the series will be on the regional geology and wine production of the Western Cape Province of South Africa, by Christopher Bargmann, one of the 48 current Cape Wine Masters of South Africa. This is an area with 300 years of wine production, and one with spectacular geology and scenery as well. We hope to return to the Okanagan Valley by publishing a paper on a Geographic Information System (GIS)

approach to the characterization of Okanagan vineyards by Patricia Bowen (viticulturalist) and Scott Smith (geologist) of the Pacific Agricultural Research Centre (PARC) at Summerland, B.C. We are also hoping to attract a paper on the terroir of a California setting in the near future.

Meanwhile Larry Meinert and Alan Busacca of Washington State University are continuing their terroir studies, in part by really focussing down: they are, under controlled conditions, examining changes in the body and flavour of wines which may be specifically related to such geological factors as differing soil profiles. This should be an excellent paper in the series! Larry is also organizing a terroir symposium for the Geological Society of America meeting to be held in Seattle, Washington, November 2–5, 2003: we hope to obtain some of these papers for the series. It is planned to dedicate this symposium to the memory of Simon Haynes, whose vision, enthusiasm, considerable knowledge and dedication got this series underway.

We continue to be on the lookout for good papers on geology and wine. This is an international series, so we welcome papers from any region. Now that Canada is becoming established on the international wine scene, particularly in icewines, it would be great to see more papers from Canadian settings.

Raise your next glass of wine to Simon Haynes, our series founder: well done, Simon!

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