

Grape vs. Grain

A HISTORICAL, TECHNOLOGICAL,
AND SOCIAL COMPARISON OF
WINE AND BEER

Charles Bamforth

University of California, Davis



CAMBRIDGE
UNIVERSITY PRESS

CONTENTS

Preface • ix

1. Beer and Wine: Some Social Commentary • 1
 2. A Brief History of Wine • 13
 3. A Brief History of Beer • 23
 4. How Wine Is Made • 61
 5. How Beer Is Made • 79
 6. The Quality of Wine • 105
 7. The Quality of Beer • 115
 8. Types of Wine • 129
 9. Types of Beer • 141
10. The Healthfulness of Wine and Beer • 163
11. Conclusions about Beer and Wine – and the Future • 181

Further Reading • 199

Index • 201

PREFACE

I FLEW TO HEATHROW FROM INDIA, VIA FRANKFURT. THE FOUR-hour holdover in the German airport had not remotely bothered me. I hate tight connections, and, besides, I was able to indulge in some sausages and weissbier while peaceably reading my newspaper, a faint buzz of conversation surrounding me.

Later the same day, I found myself for the first time in several years in central London. Strolling toward Hyde Park Corner in the dusk of early evening, it occurred to me that the traffic heading toward the West End was much heavier than I recalled from when I was a more regular visitor and living just a short train ride away. As I walked, there was suddenly the most stupendous whooping, and I turned to see two girls, probably late teens, hanging (in every sense of the word) out of the windows of a stretch limo and gyrating maniacally.

I thought little of it – surely an aberration – and continued my stroll, eventually pitching up at The Crown on Brewer Street, close to Piccadilly Circus. It was a hostelry I knew of old, and, in truth, little within had changed, with the exception of the display on the bar. There was row upon row of taps for dispensing kegged beer, but just a solitary handle for pumping traditional English ale from

the cask. I had a pint of the latter, a worthy drop of Charles Wells Bombardier.

Half an hour later, I took a table at an Italian restaurant on Wardour Street and washed some crisp salad and succulent lamb's liver down with successive glasses of the house white and house red, both charming Italian vintages. There wasn't much on offer by way of beer.

Venturing back toward the Underground station, I decided to take in one more pub, this the St. James Tavern on Great Windmill Street (being of *that* age, I needed the loo more than I needed another pint). The bouncer on the door looked at me curiously but said little. I soon realized why. I, an amply-bellied and balding fifty-something, must have looked like a solitary cashew amidst a heap of raisins. The place was heaving. Extremely young people were screaming to be heard above a blast of decibels that must surely have been making their ears bleed. There wasn't a glass in sight; rather, everyone was hugging to their bosoms (no space for arm's length here) bottles of premium lagers or RTDs ("ready to drinks"), also known as Malternatives or FABs ("flavored alcoholic beverages"). I craned my neck to look at the bar, but saw no immediate evidence of beer pumps. Feeling claustrophobic, I made for the restroom. Through the door of the cubicle, I saw that the toilet had collapsed in pieces. Almost in panic, I wrestled my way back to the bouncer. "I think I jut doubled the average age in here." He smirked and looked away.

Back on the street, as I gasped my deepest for breath, another stretch limo crawled past amidst the jam of cars, incongruous rickshaws, and people spilling off the pavement. From the limo windows, young girls caterwauled.

As I sat, dumbfounded, on the tube train taking me back towards my hotel, it occurred to me how I had that day witnessed living proof of a thesis that forms the heart of this book. Early twenty-first century London is the embodiment of why alcohol, most especially beer, has achieved such a negative image in the minds of many.

In the space of less than a day, I saw examples of the decline of locally traditional values in a proud industry (the dearth of cask ale in London) and beheld the positioning of wine in a more refined and wholesome environment (the restaurant, which had two pages devoted to the wine selection, and just one line to the solitary bottled beer available). Yet, I had confirmed how beer (the wheat beer in Germany) can also be dealt with respectably as well as being the perfect accompaniment to a meal. I experienced the evolution of the current drinking ritual, which has little if anything to do with the quality criteria that I describe for wine and beer in this book and everything to do with displays of sexual and other forms of aggression, and addiction to partying.

The producers of alcoholic drinks get the blame. In fact, it's the *purveyors* of alcohol that are letting everyone down, both by enticing the young into such displays of abandon and for not emphasizing and marketing the genuine wholesome attributes of the alcoholic beverages that have become secondary to the real fixation. Moderation is not a word in the lexicon of these people.

This book is about beer and wine. It speaks of the worthiness of each as part of a respectable, respectful, and restrained lifestyle. Above all, though, based on the unfortunate belief of many that beer is a "bottom feeder" in the world of alcohol, with wine bobbing on waves of respectability, I seek to compare these two beverages on the basis of their history, technology, scientific and artistic appreciation,

xii • Preface

and impact on the body. To that extent, and reflecting my professional specialty, the theme of this book is primarily one of demonstrating how beer is a product of an excellence and sophistication to match wine, and I seek to do this by championing beer while being entirely fair to that other noble beverage.

I. Beer and Wine
Some Social Commentary



I MUST COME CLEAN BY ADMITTING TO HAVE WORKED IN OR around the brewing industry for nearly thirty years. It will come as no surprise to you, then, that I drink beer. I like beer. I admire brewers. I think they are some of the most skilled, devoted, and ingenious people on the planet. Charming, too.

However, I do not dislike wine, nor the viticulturalists and enologists who bring that amazing product to the market. I drink wine, though I prefer beer. I believe that the brewer has much to learn from the winemaker with regard to re-establishing their product as an integral component of a wholesome and elongated lifestyle. Equally, the winemaker must doff his or her cap to the brewer insofar as technical matters go. There is no question that brewing leads the way in matters technological and scientific. Indeed, throughout the industrial ages, brewing has been a pioneering process that has informed all other fermentation industries, even to the production of pharmaceuticals and the latter-day *biotechnologicals*, with their diversity of high-value products.

In this book, I compare beer and wine. I do not seek to decry wine. Rather, I aim to demonstrate why brewers can hold their heads high in the knowledge that their liquid is every ounce the equal of wine,

by any yardstick you choose to nominate. At the same time, I will highlight the frustrations I have that many brewers do so little to truly champion beer for its inherent qualities, but rather seek the popularity low ground with their outrageous (if hilarious) advertising regimes and product innovation strategies that spawn drinks (notably the Maltalternatives) that are alarmingly variant to the beers that we have enjoyed for generations. Compare, if you will, the imagery associated with beer as opposed to that of wine.

The word “wine” conjures images for me of chateaux on hillsides in leafy France. Or I picture the mission-style façade of Robert Mondavi’s vineyard, as well as wineries of other notable names in Napa. I see the ritual of the wine sommelier rejoicing in the ceremony of the bottle presentation, ritualistic decorking, and offering for approval. I applaud row upon row of books on wine at any bookstore, rich volumes held in biblical reverence. I see family picnics with wicker baskets containing canapés and smoked salmon, with ladies in gossamer gowns.

As the reader will deduce from this book, I have no doubt in my own mind that beer could just as readily occupy rarefied scenarios, but much more besides. Frankly, though, a word association game with the word beer will generate for many images of steaming factories in dark mill towns, bottles with torn labels plunked on Formica tables to accompany burgers and fries and perhaps a cigarette. Likely as not, your waiter will not spontaneously give you a glass to drink from and, even when you get one, it is likely not the appropriate receptacle for the beer concerned and will be badly washed, leading to instant killing of the foam or at best some dreadful bladdery bubbles. And that is if you get to see the bubbles, for the waitress is likely to go to extreme lengths to pour real gently down the side of

4 • Grape vs. Grain

the glass so as to *avoid* bubble formation. When will they learn that they should splash the beer down into the center of the base of the glass, so as to give the carbon dioxide every opportunity to convert to bubbles, and so that a large head of foam will be produced? *Then* they can leave you with the bottle for you to top up your glass to your heart's (and eye's and mouth's) content.

I struggle to find books on beer, and when I do they inevitably turn out to be treatises on how to brew your own in a bucket or a thousand-and-one ways to describe the state of drunkenness. Words like suds that have crept into common parlance are better suited to bowls of washing, not beer. I see gangs of loud immature men, belching, farting, and falling over. I see drinking games and ritualistic bad behavior.

I am not naïve. I know which segment of society drinks the most beer: young males. Not in a million years would I presume to suggest that brewers should turn their backs on this sector. But I trust that they will preach moderation to them. My wish is that all brewers will realize (as some do already) that they too can appeal to those who presently savor their wines and who perhaps do not realize the pedigree and potential of the grain-based beverage.

Travel the world, though, and you will find cultures where beer is very much romanced and regarded as more than an equal for wine; indeed, it is an inherent cultural feature. Nowhere is this truer than Belgium. The diversity of beers is immense: There is not an occasion unsuited to the consumption of beer, with the exception of the communion chalice. Not only that, the beer must be presented with a theater and reverence no less essential than for the pouring of a fine wine.

I recall a visit to the home of a good friend in Antwerp. He invited me to choose a pre-prandial beer from his collection and I dutifully

selected something after hearing the seemingly unending list of what he had to offer. The drink did not appear for twenty minutes as he hunted for exactly the correct glass, the one with the appropriate shape and dimensions for the beer, the one with the relevant brand logo in place. I told him that it really didn't matter which glass he provided, but I might as well have told him that it was immaterial whether the subsequent excellent meal was served on paper plates and eaten with plastic knives and forks.

Thus, Belgium falls fair and square in the list of "beer countries." Alongside them we might also list the likes of the Czech Republic (home to comfortably the most formidable drinkers of beer), Germany, Ireland, the United Kingdom and, yes, the United States (Table 1-1). "Wine countries" include France and Italy. Perhaps it will come as a surprise to some, though, that in Spain and Portugal, they consume more liters of beer than they do of wine. Of course, we must factor in the strength of the beverages if we are to consider any country in terms of the amount of alcohol derived from the two sources.

Perusal of Table 1-1, however, reveals the magnitude of the difference between beer and wine for their importance to the American customer. There is a slight decline in beer and increase in wine over the five-year period displayed, but beer is still the premier beverage in a nation that represents the second largest beer market (after China – where there is not much consumption per head, but an awful lot of people). The sheer population of the United States itself means that, despite the low per capita consumption of wine, it is the third largest wine market in the world (after France and Italy).

There are not many countries where beer volumes are growing. China has been a phenomenal story: From 1970 to 2003, the annual production of beer increased from 1.2 to 251 million hectoliters. To

6 • Grape vs. Grain

TABLE 1-1. BEER AND WINE IN MAJOR MARKETS

| Country | Beer consumed (liters per head) | | Wine consumed (liters per head) | |
|----------------|------------------------------------|-------|------------------------------------|------|
| | 1998 | 2003 | 1998 | 2003 |
| Australia | 95.0 | 87.3 | 19.7 | 20.7 |
| Belgium | 99.0 | 96.6 | 21.7 | 24.8 |
| Brazil | 50.2 | 45.9 | 1.4 | 2.0 |
| Canada | 67.0 | 68.4 | 8.9 | 11.0 |
| China | 15.6 | 19.4 | 0.9 | 0.9 |
| Czech Republic | 160.8 | 161.0 | 15.4 | 16.9 |
| Denmark | 107.7 | 96.2 | 29.1 | 30.1 |
| France | 38.6 | 35.5 | 58.1 | 49.0 |
| Germany | 127.4 | 117.5 | 22.8 | 23.6 |
| Ireland | 124.2 | 118.0 | 8.8 | 13.3 |
| Italy | 26.9 | 30.1 | 52.0 | 50.5 |
| Japan | 57.2 | 50.9 | 3.3 | 2.2 |
| Mexico | 49.0 | 51.7 | — | — |
| Netherlands | 84.3 | 78.7 | 18.4 | 19.6 |
| Portugal | 65.3 | 60.0 | 58.0 | 50.0 |
| Russia | 22.5 | 51.4 | 6.0 | 8.2 |
| Spain | 66.4 | 78.3 | 35.0 | 28.2 |
| United Kingdom | 100.6 | 101.3 | 15.7 | 20.0 |
| United States | 83.7 | 81.6 | 7.3 | 8.0 |

Data courtesy of the British Beer and Pub Association.

put that in context, consider that the U.S. production went from 158 to 230.8 million hectoliters. Per capita consumption in China, while increasing, remains low, for disposal income is still limited. Countries where beer consumption per head is growing include Russia (and other countries from what was once the USSR – vodka is losing its compulsion), Spain, and South Korea. Several countries are showing steady growth in wine consumption per head, as

a glance at Table 1-1 shows. The decline in wine consumption is notable for being located in the great wine countries of France, Spain, Italy, and Portugal. Beer in decline and wine on the increase in Germany, beer on the rise and wine in decline in Spain: a case of seeing how the other half lives?

The factors impacting the overall consumption of alcoholic beverages in any community are diverse and complex. They include lifestyle and consumer demographics, notably age, disposable income, and, of course, image. In many societies, the populace is becoming better educated, wealthier, and choosier. They expect choice and diversity. They make decisions based on perceived quality. Balance judgments are made and, in this, surely the wine industry in countries such as the United States has stolen the moral high ground. Where there is growth in the beer market in this country, it reflects the consumer's interest in matters of health and well-being, ergo the march of light beer, or an interest in products different from the mainstream lighter flavored lager-style beers that still comprise the bedrock of the industry. Thus, the emergence of the craft brewing industry spoke to the interest of consumers in regional, fully flavored (I would say in many instances grossly *over-hopped*) products. The search for new types of beer also fueled the demand for imported products that capture the imagination and assume a provenance of traditional British, Germanic, Irish, or Dutch brewing excellence. The fact remains that the majority of beers imported into the United States display a profoundly aged character, and assume an aroma described by the beer taste expert as wet paper or cardboard. To the cognoscenti, this is as reprehensible as corked taint in wine. But the consumer still buys these beers, purchasing a bit of Burton, a dash of Dublin, or a schloss of Stuttgart.

I am quite convinced that customers purchasing imports and regional brews have in their mind's eye an image of a rustic brewery handcrafting beer in time-honored vessels according to ancient recipes. In reality, many of the imports are from huge modern breweries employing the latest technologies and practices. Some of the micro-brews in the United States emerge from dubious equipment, badly configured and begging for investment. As such, the quality of some of these beers as judged from within the expert brewing community is, frankly, deplorable. By contrast, the domestic brands produced in huge volumes and flashed across our television screens between baseball innings and at basketball time-outs are outstanding for their consistency, cleanness, and purity. Yet it is the micro-brews that have captured the consumer's imagination by touting a perceived sophistication that belongs in the same class as that engendered by wines.

There are major global beer brands – not least Guinness – that have assumed an aura of romance. I recall some while ago receiving an e-mail from a woman who asked whether it was true that the difference between Guinness brewed in London and that in the mother brewery of Dublin was that they marinate a dead cow in the brew from Ireland. They don't.

The major breweries of the United States and elsewhere in the world are places of sophistication and excellence. They are hygienic, airy, busy, and highly productive. They are working 24 hours a day, 365 days in the year, striving towards products of consistent excellence. They may be packaging bottles at rates exceeding 1,200 bottles every minute or cans more than twice as quickly as that. And most often, they are located in less than beautiful surroundings, historically matched to centers of high urban population. To the consumer, these are factories, but you will never hear a brewer using

that word. They are breweries, sophisticated, often highly automated, but always using time-honored brewing techniques. The only differences from a pub-based brewery are that the brewer spends more time looking at a computer screen, the facility is almost always rather cleaner, and the product is invariably more consistently excellent.

Occasionally, one encounters a brewery of genuine esthetic appeal. For example, you should head to the Sierra Nevada brewery in Chico, California, to see a facility that is the equal of any winery for style and sophistication, while at the same time having a technological and environmental conscience unmatched by the vast majority of winemakers.

There are some wineries that aspire to the sophistication of the mega breweries. And in just the same way that the major brewers are too often decried for producing somehow inferior products (when the reality is that their beers are actually vastly superior in terms of consistency of quality), the big “factory” wineries are pilloried as churning out down-market hooch. Nothing could be further from the truth, yet it is even more the case for wine than for beer that the customer associates quality and excellence with the products of smaller rural wineries of charm and elegance. It is almost as if the quality of the wine derives more from the art of the architect rather than the wit of the winemaker.

Winemakers speak of vintage. The plethora of wine literature grinds the dust fine on nuances of year, varietal, and winery. Brewers don't: A brand is a brand, and the expectation is that the beer should taste as expected every time, year on year. No need, then, for the bartender to offer the customer a sniff of the beer first to garner agreement that the rest is fit for consumption. No sniffing of crown cork closures. What is the ritual of wine pouring: a charming,

time-honored component of the overall wine drinking experience, or living testimony to the inability of a winemaker to achieve quality control? Or both?

Another e-mail I received recently was from a man who decried my insistence on preaching the gospel of consistency for beer. Why, he wanted to know, was it so important for every batch of beer to be so consistent. He liked surprises. My retort was that he would not be happy if a batch of anesthetic was out of specification and didn't quell the pain if he was having a surgical procedure. He would equally think it distinctly unacceptable if on opening the can he found his tomato soup to be blue. He would also be a tad miffed to find that gallons of gasoline varied in their ability to support the smooth running of his automobile. To me, the same principle should apply to wine as it most certainly does to beer: have your expectations fulfilled.

A fundamental difference between the production of beer and wine concerns the juxtaposition of raw materials and production process. It is customary for a winery to be built adjacent to the vineyard. Thus, there is a far closer connection between ground and glass for wine, the wine company being at once viticulturalist and winemaker. By contrast, it is very unusual for the brewery to be located adjacent to the barley crop. Rather, it is the malt house that tends to be located close to agriculture, remembering that barley needs sufficient pre-processing before it is in fit condition to be made into beer. While some brewing companies own their own malt houses and produce some or all of their malt (Anheuser-Busch and Coors are notable examples), by far, the majority of brewers buy their malted grain (and adjuncts) from suppliers.

These differences do not mean that the winemaker somehow has a greater control over the character of their products. The brewer is

probably more fastidious, demanding rigorous adherence to quality specifications for barley and the malt derived from it, as we shall see in Chapter 5. What it does mean, though, is that the winemaker tends to have a more substantial investment in land and the cultivation thereof: The establishment of a vineyard represents a considerable outlay. A study from my university in 2004 indicated that the cost of establishing a vineyard in Sonoma County, California, exceeded \$16,000 per acre. Bear in mind, too, that it takes some four to five years from first planting for there to be a satisfactory harvest of grapes. The yield per acre is likely to be of the order of five tons. The current price (February 2007) for grapes in Napa County is \$3,051 per ton, with a statewide average of \$581 per ton.

A ton of grapes will yield approximately 150 gallons (around 750 bottles) of wine of average strength. On this basis, then, we can conclude that the cost of grapes for each 750-mL bottle of California wine would be something between 78 cents and a little over \$4, depending on where they are grown. Let's say we are buying a bottle of wine from the Central Valley at a cost of \$5 in the supermarket or a bottle from a Napa winery at \$20: The grapes amount to a fifth of the purchase cost.

Compare the situation with beer: Assuming that a brewer is making an all-malt product (though the cost of adjuncts is a similar order of magnitude), then they may be purchasing that malt at a cost of some \$500 per ton. If they are producing bottles containing twelve fluid ounces of a beer that is 5 percent alcohol by volume, then the cost of malt per bottle is approximately 2.5 cents. Let us say we sell beer at a dollar a bottle, then the order of magnitude of malt cost will be about 2.5 percent. Bear in mind, of course, that a bottle of beer with an alcohol content the equivalent of wine (and they do exist – see Chapter 9) would demand pro rata more malt equivalents

per bottle, but the cost of this raw material will never reach that of grapes in the wine. However, we should not forget that the brewer has also to pay for hops and water.

Does this cost differential speak to a reality founded on some supposed superiority of the grape as opposed to the grain, akin to comparing pearls with colored stones? Is it a reflection of bulk agricultural capability, with economies of scale in terms of the growing of vast acreages of barley compared to the “cottage industry” craft of the vineyard? Or is it simply a case that the maltster is obliged through laws of competition and user power to suffer deflated price opportunity while, conversely, grapes are retailed at unrealistically inflated price tags, especially from some regions that don’t genuinely have that degree of superior quality?

Let us not forget that a major brewing company will be producing beer 24 hours a day for 365 days of the year. There is no concept of a crush for them: all hell let loose for a few weeks after the grapes enter the winery. It is always a mystery to me what those wine guys do for the rest of the year.

But here is the difference: the brewer genuinely sweats his or her assets, whereas the winemaker basically uses the vessels once per annum and will tend to have tanks filled with maturing product for far longer than will the brewer, even those advocating prolonged maturation periods. It truly does not make sense to have a product sitting in storage unless there are genuine changes taking place in the liquid that render the product, be it wine or beer, of superior quality as perceived by the consumer. I would contend that in many instances the storage is a marketing issue, allowing a tale to be told.