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CHAPTER ONE

Introduction

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Wine is complicated. Almost impossibly so.

It's the result of microbial fermentation, guided by human hands, based on a natural starting product that's harvested once a year. The grapes differ markedly from season to season, and the nature of the vineyard site—the soil and climate the grape vine grows in—differs markedly over a short distance. Differences in geography and grape variety, compounded by human choices, result in a bewildering array of commercial wines. There's no product quite like it.

Because of the variability in the starting material—the grapes and microbes—winemakers can't easily follow a formula. They need to make the appropriate choices and interventions during the winemaking process in order to produce a marketable wine they are proud to stand behind. Commercial and market considerations often enter the fray. It's not a simple process.

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Because nature and chance play such a significant role in wine production, it's not surprising that wine quality varies. And

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sometimes wines are faulty. The incidence of wines declared by professionals to be faulty in major competitions such as the International Wine Challenge is unacceptably high and probably wouldn't be tolerated in any other industry. And these are wines that have made it all the way to bottle. It's impossible to be sure how many "faulty" wines are consumed each year; it's likely that most of these are drunk, but not enjoyed, without the consumer realizing that the wine isn't supposed to taste this way.

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Hence this book. It may seem a little negative to write a book on wine faults. After all, who likes to focus on flaws or errors? Does it mean the book will be a bit of a downer? Will its sales stagnate, even if it should prove to be an important text, simply because people are turned off by the term *fault?*

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I hope not, and I deliberately chose the title—*Flawless*—to emphasize the positive. The absence of flaws may not actually be a positive quality in itself, but flaws prevent positive attributes of a wine from being enjoyed. It is by avoiding flaws that winemakers are free to achieve their goal. Beauty is marred by flaws, so their avoidance is a worthy aspiration. But the reality is a little more layered and complex than this. Sometimes, small levels of what might at higher levels be fault compounds can help beauty express itself—a theme I will return to several times in this book.

Beauty itself is much more than simply the avoidance of faults. To use a slightly religious-sounding analogy, there is more to virtue than an absence of sin. A wine may be flawless yet desperately dull. So my remit in writing this book is to go beyond simply the avoidance of faults and to touch on the semi-philosophical question of the nature of beauty as it applies to wine. As well as the traditional roster of faults, I will include more novel (and perhaps controversial) categories.

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WINE FAULTS ARE INTERESTING

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The topic of wine faults is of great interest. It's a rich, nuanced, complicated subject that strays from wine chemistry through microbiology to human perception and quality judgments. Some faults are universally agreed on: I can't see many people arguing a strong case for cork taint by 2,4,6-trichloroanisole (widely known simply as TCA) being a "complexing factor." Other faults are more a question of degree and personal preference: the spicy, medicinal, animal savoriness imparted by *Brettanomyces* yeast is a great example.

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Some make a distinction between faults and taints. Defined as resulting from the fermentation process, faults include oxidation, *Brettanomyces,* volatile acidity, and reduction. A taint, in this classification scheme, is when a wine is affected by an extraneous flavor chemical, such as cork taint, eucalyptus taint, or smoke taint. "Faults are generally internal," says Adrian Coulter of the Australian Wine Research Institute, "like something microbial, or something wrong with the wine. Taints are something coming from the outside. It might still be something in the winemaking: for example, a wine additive might be tainted with a compound, and you add it to the wine, and it taints it." In this book, I refer to both categories as "faults."

Looking for the Positives

I hope that the overall tone of this book will be rather positive. I also hope that reading it will inspire winemakers to be more creative, and not just more defensive, in their winemaking. It is through a full understanding of faults, their origins, and their complexity—acknowledging that the presence of a specific character

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can be negative in some wines but positive in others—that winemakers can leave the overly defensive path that can result in rather sterile, clean but uninspiring, technically correct wines.

Some wines are clearly faulty to all. Others split opinion. This will be a recurring theme as I examine faults one by one. Who gets to decide whether a wine is faulty or not? That's a good question, and we may have to leave the rather handy dualistic division between faulty and correct wines and move to a worldview that offers more of a continuum—at least for those wines that fall into the gray area between the two firm positions. And it looks like we will not be able to make the following pronouncement: If a wine contains chemical *x* at a level greater than *y* µg/L, then it is faulty. It turns out there are only a limited number of instances where this sort of rule makes sense.

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The Science behind Faults

While a lot of good research on wine faults has been published in peer-reviewed scientific journals, there is much that is still not documented in rigorous scientific terms. So I haven't restricted my research to the published literature. This book will include the experiences of winemakers from around the globe. These people, day in and day out, come face to face with wine faults, and their accumulated experience is a valuable source of information. On many of the topics, an honest answer will be "We suspect . . . " or even "We just don't know."

PERFECTION VERSUS IMPERFECTION: ON THE NATURE OF BEAUTY

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I want to introduce a concept that I think is really helpful for understanding wine faults, and for grasping the notion that

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some flavor chemicals can be both faulty and positive, depending on the concentration and the context. This is the Japanese concept of *wabi-sabi*. Put in simple terms, it is the idea that flaws can bring out beauty, or that flaws are in fact part of beauty. In contrast to the Western aesthetic of striving for a beauty that lies in the attainment (or near attainment) of perfection, wabi-sabi suggests that beauty is transient, incomplete, and imperfect. Features that are not beautiful in and of themselves can contribute to beauty, and the wabi-sabi aesthetic—in many ways a more satisfying and richer one—includes characteristics such as asymmetry, irregularity, simplicity, economy, modesty, and austerity. The idea of applying wabi-sabi to wine faults came from my discussions with Sam Harrop, who should get the credit.

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Wine consultant Ken Ohashi introduced Sam and me to a Japanese term that translates as "silence like a drop of water." Imagine you are sitting by a pool in a zen garden. It is as silent and tranquil as you can get. But it's the sound of water drops that shows you how silent it is—without this subtle noise, you wouldn't have recognized and appreciated the silence. Another example is the gentle ticking of a mechanical clock in an otherwise silent room: it seems to emphasize the quietness. Ohashi gives the example of a red wine that he tried, with some matchstick and pepper reductive characters. He describes these as the "minerality" of the wine, without which he thinks it would have tasted simple and even watery. But the presence of these traces of what could be called a wine fault—reduction—allowed him to see the purity of the wine. In the absence of the reduction, he wouldn't have recognized the purity.

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Perfumers are familiar with the idea that smells that are highly aversive on their own can be useful in creating a beautiful perfume. One of the most expensive ingredients in perfume

is ambergris, which is taken from what is the whale equivalent of a cat's fur ball (it is produced in the digestive system of sperm whales). This is actually quite disgusting, and smelled alone it would be repellent. But in a mix of odors, it provides interest and complements other, more immediately attractive smells while acting as a fixer, helping the aromas of the perfume persist. Another example is the aroma of jasmine. It contains small amounts of indole, which on its own would be an aversive smell. If people smell synthetic jasmine (which doesn't have indole) and the real thing (which does), often they can't tell them apart. But if they are pressed to decide which they prefer, they frequently opt for the real thing: the trace of the normally aversive indole adds something that people like to the smell of jasmine.

In a similar vein, let's consider music. What makes it beautiful? Music follows mathematical order, but not perfectly—that would be very boring. In a study published in a leading scientific journal, *Nature Neuroscience*,[1] the authors showed that music causes the release of the reward chemical dopamine in the brain, as do other pleasurable stimuli like food, drugs, and sex. They also showed that this dopamine release occurs both at peak emotional moments in the music—the "good bits," such as a melodic hook or chorus—and in anticipation of those good bits. The authors state:

> The anticipatory phase, set off by temporal cues signaling that a potentially pleasurable auditory sequence is coming, can trigger expectations of euphoric emotional states and create a sense of wanting and reward prediction. This reward is entirely abstract and may involve such factors as suspended expectations and a sense of resolution. Indeed, composers and performers frequently take advantage of such phenomena, and manipulate emotional arousal by violating expectations in certain ways or by delaying the

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predicted outcome (for example, by inserting unexpected notes or slowing tempo) before the resolution to heighten the motivation for completion.

Good composers and songwriters leave us unfulfilled. They tease us, showing us briefly the notes or chord that we want to hear and then avoiding it until the main hook or chorus. They build up expectation, and may even seek to diffuse the expectation by putting in unexpected notes or chords. In a sense, they create something more beautiful by avoiding the obvious expression of what we would classify as beauty. And the "flaws" or "deviations" highlight the beauty when it is finally revealed. Or perhaps they go deeper: the flaws and deviations may well be part of the beauty.

We find the same dynamic in the arena of flavor. Tasted alone, salt is not pleasant. It's aversive. But at the appropriate level it adds life to food, creating a tension. The same goes for lemon juice: alone it is too acidic to be pleasurable for most people, but it creates a needed tension in some dishes. Sweetness alone is cloying; counter it with adequate acidity and it's lovely.

Our attraction to faces is a further example of the complex nature of beauty. There are certain rules of facial attractiveness in humans, and the evidence suggests they are hardwired. For example, judgments of facial beauty are cross-culturally consistent among adults and children, and young babies will look longer at attractive faces than at less attractive ones. It's not an absolute property; it's just that there are guidelines governing what sort of faces people find desirable, and evolutionary explanations for why this might be so. Certainly, a beautiful face is something we find very compelling. Yet attempts by scientists to produce the "perfect" one result in a composite face that, while certainly striking and attractive, looks slightly bland and *less*

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attractive than you'd expect. It's the presence of subtle flaws that brings out the real beauty. We love faces with a bit of character, not a total absence of even the smallest flaws. Most of all, though, we are attracted to the faces of those we know and like.

How does this relate to wine? I will argue that the most attractive, compelling wines are those that have elements of their character that, if they were in a different context or present at higher levels, might be considered faulty. It all depends on the wine, the context, and the consumer. When is volatile acidity too high? When is greenness good and when is it too bad? When are tannins too grippy and firm? When are earthy, spicy characters off-putting? When is savoriness or gaminess too prominent? When is new oak too obtrusive? When does a wine pass from mature to senescent? Many of these characters are present to a degree in some of the world's greatest wines. These are the sorts of questions I will address in subsequent chapters.

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DEFINING "FAULT"

What exactly constitutes a fault in a wine is a matter of some contention. In part, it's subjective: some people enjoy a wine that has high levels of *Brettanomyces* or volatile acidity, while others find these objectionable if they are detectable. So a first-pass definition would be a subjective one: a wine fault is defined as the presence of a chemical compound (or combination of compounds) that detracts from wine quality. And here I would define *quality* as fitness for purpose. Thus, a faulty wine is one that a consumer dislikes (or likes less than they otherwise would) because of the presence of the negative quality. Faultiness could include, for example, excessive green characters and acidity owing to unripeness, or excessive sweet vanilla and coconut

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characters stemming from too much oak use. It is clear that this is a subjective definition, because some people like oak flavors more than others, and some prefer sweet ripe fruit more than others and are less tolerant of greenness in their wines. Thus, a wine can be faulty to one person and not to another. And faultiness is a continuum: wine quality is gradually lost, for example, as the wine shows more *Brettanomyces* character, even for those who quite like (sometimes without realizing what it is) *Brettanomyces* in their wine. This makes the whole issue of faults quite complicated.

A second, somewhat more objective definition is based on an "average" taster—one with average sensitivity to all potential fault compounds, along with the educated ability to recognize them when they are encountered in wine. This definition will require some sort of global consensus on the acceptable limits of the various fault compounds in wine. For example, a musty taint, such as cork taint, would be unacceptable at any detectable level. *Brettanomyces* might be considered acceptable at certain levels in some wine contexts—such as in ripe Mediterranean red wines, to which it adds spice and savoriness without dominating—but not in others, such as Pinot Noir, where it rarely works. This is a complicated and somewhat controversial approach, but it's not impossible. It's how we tend to operate in the wine trade and in wine competitions. We recognize that individual tasters differ in their biology and preferences, yet we aim at a universal standard of wine quality, which we then reward. It's not perfect, but it seems to work fairly well most of the time.

Attempting to define faults precisely is difficult and perilous, for sure. But to rely on subjective definitions creates the absurdity of saying that a wine with cork taint is not faulty if someone is happy to drink it. I will aim to be more objective, while

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recognizing that a degree of subjectivity is always involved when people taste wine.

THE STRUCTURE OF THIS BOOK

One by one, I will discuss each of the recognized wine faults. I'll try to keep these chapters practically focused, looking at how wine faults present themselves in the real world and giving advice on how they might be avoided. I'll also try to assess just how much of a threat or problem each of these faults is. Certain themes—those raised here in the discussion—are recurring. I considered whether to provide a reference for every statement, as in a scientific review, but that would make this book what it isn't—a book for wine scientists. So I decided to add references to a few of the most important studies and reviews, but this is by no means intended as a complete account of the literature. While I've made every effort to ensure accuracy, to have cited a peer-reviewed paper supporting each statement would have changed the nature of the book. In addition, there is often disagreement in the scientific literature on many of these topics, and to note each contrasting viewpoint would have been tedious. Instead, to produce what I believe is the most accurate account of each of the faults we are dealing with, I combined my reading of the literature with insights from winemakers' practical experience and my own knowledge of wine. The quotes included here are taken from conversations and interviews with winemakers and wine scientists. I travel extensively, and in the course of that travel I speak to many people: the individuals quoted here are just a subset of those I've discussed the subject of wine faults with. More of them could have been quoted, and I'm grateful to all who have taken time to talk openly with me and

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share their experience. They have all helped shape the content of this book, but ultimately I have had to form my own opinions. Therefore, this book is not completely neutral: it consists of the facts and of educated interpretations of the facts. I hope that it makes a useful addition to the wine literature, while being broad enough in scope to be of use across the wine trade.

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