



Shattered Myths

Expensive crystal? Coffee mug? Jelly jar? **Does it really matter** what you drink your wine from? BY DANIEL ZWERDLING

T HIS IS THE MOMENT WE'VE BEEN WAITING FOR. This is the moment that's compelled 13 wine lovers to leave the comfort of home during one of the most dangerous storms of the winter and risk our lives driving through ice and sleet and snow—literally—so we can assemble around a horseshoe table glittering with dozens of crystal wineglasses. We each gently grasp the tapered stem of the glass marked “No. 2, Vinum Montrachet” and raise it expectantly to our lips.

We're about to answer a question that's asked innumerable times in wine stores and upscale restaurants and at our own dinner tables across America: Do glasses really change the way wines taste and smell?

“Don't taste yet,” Victoria Margolis says, and some of us sigh audibly as she postpones our gratification. Margolis represents Riedel, the famed European glassmaker. She's also driven miles through this ice storm—much as ancient disciples trekked through the desert—to spread the word to this band of potential converts.

Even before we showed up at a winery in Pennsylvania for this event, which Riedel advertised in *The Wall Street Journal*, all of us had heard the gospel that's sweeping the food and wine world. Riedel glasses are a “revolutionary” blend of “science and art” (according to *Wine Spectator*). “The effect of these glasses is profound” (so says legendary taster Robert Parker). Made in a bucolic town in Austria, Riedel's glasses have dazzled jaded journalists in the heart of American wine country (they “can make a dramatic difference in both the flavor and aroma of wine,” proclaims the *San Francisco Chronicle*).

Now here we sit, in front of our individual tasting stations, wondering if Riedel glasses will work the same magic on us. There are five glasses at each setting, arranged in a semicircle on a printed paper mat. Four are Riedel's: One is broader, another is taller, one's more tapered, but all are delicate and

feathery light. The fifth glass is the generic wine goblet you might get at a pizza parlor. It's dismissively labeled “Joker.”

“Before you taste,” Margolis says, “I want you to swirl it and smell it.” We're still holding Riedel Glass No. 2, which Margolis's assistant has filled with Chardonnay made at our host vineyard—which is appropriate, because Riedel has designed this glass specifically to show off Chardonnays. Don't confuse it with the glass Riedel sells specifically for whites from the Loire, or the glass designed specifically for whites from Alsace, or the glass for German Riesling, or the one for Austria's own Grüner Veltliner, or the glass for Chablis—to name just a few of the possibilities for whites alone.

The way the Riedel company explains it, the volume and shape of each glass are “fine-tuned” to showcase the aromatics that waft out of the target wine. “There's a lot of science behind Riedel glasses,” Margolis says. She takes a deep sniff of Chardonnay from No. 2. “Beautiful, straw,” she says.

Before we take a sip, she instructs us to study the diagram in the center of our tasting mats. It's labeled “Taste Zones of the Tongue.” This “tongue map,” as she calls it, depicts the tongue as a kind of triangle that's divided into striped or dotted zones, like survey plots. There's the pointy tip, where the map says you taste sweet; the long, narrow sides, where you taste salt; the wider inner strips, where you taste acid; and, finally, the broad band along the back, where you taste bitter.

The Riedel company says it painstakingly designs the glasses to deliver the wine to a precise target on your own tongue's map every time you take a sip. As a result, Riedel insists, the wine will hit the exact taste buds that bring out the best flavor notes.

Of course Riedel isn't the only company that swears its glasses work wonders. Spiegelau will tell you how its stemware produces “aromatic balance of the wine during both the nasal and retronasal olfactions,” and Ravenscroft Crystal brags that its glasses deliver “the essence of the fluids to the

proper zones of the palate.” But Riedel has waged the most aggressive marketing campaign and makes the most elaborate scientific claims.

“So go ahead,” Margolis says. “Now you may taste.” There are murmurs of relief around the room. “Close your eyes, and recognize *where* the wine falls on your palate.” I’m embarrassed to say that as I close my eyes and sip, I can’t pinpoint exactly where the wine’s landing on my tongue. So I check the shiny black booklet that she’s handed out for guidance. “The wide mouth of this generously shaped glass steers the wine mainly to the sourness-sensitive edges of the tongue,” the pamphlet explains, “ensuring that the acidity is sufficiently emphasized to create a harmonious balance with the luscious fruit of the late-harvest, healthy grapes and the sweet toasty aromas of the wine’s aging in oak barrels.”

Margolis looks up from her glass. “Well balanced, very nice. You’re going to get a little citrus on there,” she pronounces. “Did you get that?” She looks at everyone for agreement. “A little lemon?”

But when we pour the Chardonnay into another Riedel glass—designed for another type of white—Margolis puckers her face after taking a sip. She says this glass dumped the wine too far forward on the tips of our tongues, where the map shows we taste sweet. So “what happens is it tastes *too* sweet,” she says, looking to us again for agreement. “It’s like drinking Riunite.” And everybody laughs.

But nothing could be as bad as pouring the Chardonnay into the generic Joker. “Go ahead,” Margolis says, “give it a swirl and smell.” And before anyone has time to respond, she delivers her verdict. “Actually, I smell nothing,” she says, with a resigned air. “Is *anyone* getting anything off of this glass?” She raises her eyebrows and looks around the room. We sip. Margolis grimaces. “Salty,” she says, and she puts the Joker down, as though this humble glass were contaminated. “It tastes salty because the wine went to the *center* of our tongues first.”

By the time the session’s over, this little group of tasters has bought about \$1,000 worth of Riedel glasses. “I was surprised,” says Jim Pusateri, who’s one of them. He says he

“acid” spots near the middle? “Nope,” Bartoshuk laughs. “It’s wrong.” She and other scientists have proved that you can taste salty, sweet, sour, and bitter *everywhere* on the tongue where there are taste buds. “Your brain doesn’t care where taste is coming from in your mouth,” Bartoshuk says. “And researchers have known this for thirty years.”

Call Riedel’s glasses graceful. Call them beautiful. Who would argue that a lovely frame doesn’t enhance the enjoyment of a painting? But despite Riedel’s and other companies’ claims—and despite all the anecdotal testimony from wine critics and consumers alike—researchers haven’t found any scientific evidence that a \$90 glass makes your wine smell or taste better than a \$3 version from Wal-Mart.

In fact, you might want to stop reading this article if you’ve gone to a Riedel tasting and left as a convert. Because studies suggest you’ve been brainwashed.

YOU CAN OFTEN TRACE a turning point in history to an epochal event—and in the universe of wineglasses, the earth shuddered on October 24, 1997. Wine aficionados from around the country had gathered at the Marriott hotel in New York’s Times Square for an annual event sponsored by *Wine Spectator*. Riedel glasses had already been endorsed by some influential winemakers and critics, but on this cool and cloudy afternoon, more than 1,000 rank-and-file drinkers poured into a ballroom to put Riedel’s claims to the test.

Thomas Matthews, the magazine’s executive editor, was there. “Everybody who ventures into a Riedel tasting starts as a skeptic,” he says. “I did.”

But Matthews says that as Georg Riedel, the company’s president, guided the crowd through the dizzying tasting, pouring wine into one glass after another, “people were surprised and even shocked. I think at that point, very few people had had the [Riedel] experience. And before you have it, it seems nonsense that the shape of a glass can significantly affect the flavor and aroma of wine. After Georg Riedel gets through with you,” Matthews continues, “almost everyone is a convert. It’s partly because he’s a very persuasive speaker.

The Cabernet-filled glass is strapped to a little platform just below your head, a switch is flipped, and the glass starts to jiggle.

never knew about the tongue map before, but now he’s sold on Riedel. “Absolutely,” agrees Jim Couch, who’s buying a set. “I’ve resisted this whole Riedel craze, which a lot of my friends have gone through, because the glasses are so expensive. But I think I’ve been convinced.”

There’s just one problem: Studies at major research centers in Europe and the U.S. suggest that Riedel’s claims are, scientifically, nonsense. Starting with the tongue map. “The tongue map? That old saw?” scoffs Linda Bartoshuk when I reach her at her laboratory at the Yale University School of Medicine. Bartoshuk has done landmark studies on how people taste. “No, no. There isn’t any ‘tongue map.’”

Wait a minute: When you sip Pinot Noir from the correct Riedel glass, won’t it maximize the fruit flavors by rushing the wine to the “sweet” zone on the tip of your tongue? When you serve a Chardonnay with too much fruit, won’t the correct glass balance the flavors by directing the wine to the

He’s a master salesman. He’s almost a prophet, with that passion. But the wine did taste better in the right glass.”

Georg Riedel’s friends (and his detractors) will tell you that he’s confident, charming, and ambitious. His family has been making glasses since 1756, but it was his father, Claus, who died last March, who devoted much of his career to studying “the physics of wine delivery to the mouth.” As a result, the company declares, he became “the first person in history” to discover that even tiny variations in a glass affect a wine’s “harmony, depth, balance and complexity.”

Trouble was, most people in the food and wine world didn’t buy it. Georg came up with a plan. He figured that if he could meet face-to-face with potential buyers, if he could get them to touch their lips to his glasses, he could break down their resistance and “make them believers.” He and his staff stage tastings across the country, at conventions and restaurants and wine shops. And then those new con-

verts go forth among the flocks and spread the Riedel gospel by word of mouth.

You'd think this kind of success might be satisfying enough. But Riedel is a proud man, and even as sales were taking off, he seemed to crave something that still eluded him: He wanted validation from the scientific community. So in the late 1990s Riedel staged a tasting for scientists at the Monell Chemical Senses Center, one of the world's most prestigious laboratories studying taste and smell.

AS RIEDEL LED THE CENTER'S staff through the usual paces, at least a few scientists were swayed. "None of us are wine experts," says Monell's Marcy Levin Pelchat. "But the wine did, indeed, seem different in different glasses." On the other hand, she says, Riedel kept hinting which glasses should make the wine taste better or worse—and like any good scientist, Pelchat knew to trust results only from carefully controlled studies in which people don't know exactly what they're testing. But when Pelchat and a colleague scoured the scientific literature, they couldn't find a single study in which researchers had tested Riedel glasses under rigorous conditions.

They decided to be the first. Pelchat and her colleague Jeanine Delwiche rounded up 30 subjects, all of them from Monell. There would be no hoopla at these tastings; the atmosphere was almost medical. Imagine, now, that you were one of those 30 pioneers who volunteered in the service of science.

You are led through a heavy door into an environmentally controlled chamber. The only sound you hear is a gentle whoosh as the laboratory's ventilation system constantly refreshes the air so your olfactory system can't be sullied by odors that don't come from within the wineglasses themselves. Next, a pair of blackened goggles are slipped around your eyes so you can't see which glass is which. Your head is positioned in a metal and plastic gizmo that looks like a torture device (who says testing wineglasses is supposed to be fun?); the apparatus is designed so that when the researchers place a glass with precisely 60 milliliters of Cabernet below your nose, the rim of the glass will be the same distance from your nostrils every time. That way, you can't smell the aro-

mas differently simply because you're sticking your nose at different depths into each glass.

And now comes the moment of truth.

The first of several glasses filled with Cabernet is strapped to a little platform just below your immobilized head; Pelchat says it might be a Riedel Chardonnay glass, or a Riedel Bordeaux glass, or a water goblet, or just "one of my cheap wineglasses that I use at home when relatives come over." The scientist flips a switch and the platform starts to jiggle, which makes the wine swirl around the glass. This is important: The machine does the sloshing for you while you keep your hands in your lap, because if you touch the glass you might be subconsciously swayed by how it feels. Finally, you rate the aromas on half a dozen sliding scales.

When Pelchat and Delwiche run the answers through a computer, the cold statistics tell a dramatically different story than Riedel's tastings. The subjects couldn't tell any differences from one glass to another in how fruity or oaky or musty the same wine smelled. The tasters did find a small but notable difference in how "intense" a wine smelled in different glasses, but—oops—it smelled *less* intense in the Riedels than it did in the cheaper glasses. More important, there was virtually no difference in how much or how little they *liked* the aromas.

It's certainly possible to dismiss the Monell study as too limited, since they tested only a few dozen subjects, and the subjects only smelled the wines. Maybe that explains why Riedel pressed his luck by asking another scientist to examine his glasses.

Riedel called on Thomas Hummel, a prominent physician and a researcher at the University of Dresden, in Germany, who spends part of his time treating patients with diseases that impair their senses of taste and smell. The way Hummel tells the story, Riedel asked him to do a major experiment to prove that his glasses work the way he claims—and Riedel said he'd pay the bill. Hummel said fine, but he had to have scientific freedom. To his credit, Hummel says, Riedel agreed.

This study was much bigger and more elaborate than the one at Monell. Hummel and his colleagues recruited almost
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YOU CAN'T ALWAYS BELIEVE WHAT YOU READ IN THE PAPERS

Georg Riedel finally seemed to be vindicated when media around the world trumpeted the results of a study conducted at the University of Tennessee. "A U.S. study found that the shape of a glass can have a big influence on chemicals in wine," the London-based *Daily Telegraph* glowed, in August 2002. "Wine really does taste different depending on the kind of glass it is drunk from, according to research."

"Scientists prove the right glass matters," declared *Decanter* magazine. "It's official—wine really does taste better out of the right glass." The findings were cited by everyone from *New Scientist* magazine to American radio legend Paul Harvey. Riedel himself must have been relieved. "It is great," he told a reporter, "that independent scientific research supports our philosophy."

But when I tracked down the researcher who did the study, she groaned. Then she started laughing. "I can't believe how reporters ran away with this thing," says Kari Russell. "That's because so many people *want* to believe" that glasses make a difference. First of all, Russell is bemused that nobody seemed to realize that she wasn't a renowned scientist, but a mere college senior (she's now working on a Ph.D.). And she didn't do some big, rigorous study: She rounded up just a dozen subjects.

And what she finds even more bizarre, she says, is that Riedel wouldn't have liked her findings if anybody had reported them correctly, because they don't support his claims at all. "Glass shape does *not* affect the perceptions of the average consumer," Russell told me. "That's my conclusion." To

put it bluntly, her subjects couldn't tell the difference between Merlot in Champagne, red-wine, or Martini glasses.

But Russell says what galls her most is that not a single newspaper reporter who wrote about the study ever bothered to call and ask her about it. She says she figures that they wrote their articles based on another article by a reporter who heard Russell speak about her senior thesis at a meeting—and unfortunately, *that* reporter ignored her conclusion. Russell told me that she even called some of the newspapers to ask them to correct their articles. Nobody called her back.

Russell left me with an urgent plea: "Please don't say the name of the wineglass company," she says. "I don't want to make them mad. I might need to ask them for a job someday." —D.Z.

200 subjects. They gave everybody a physical to make sure they were healthy. They subjected them to psychological and intellectual tests, to make sure the subjects were, well, “normal.”

Hummel had subjects compare the flavors of wines from dramatically different glasses. We’re not talking about comparing minute variations between, say, Riedel’s glass for mature Bordeaux and his glass for Zinfandel. Hummel wanted to see if the subjects could find any difference between a traditional, round-shaped Riedel wineglass and other glasses, shaped more like squares and tulips.

As it turned out, the test subjects couldn’t detect any difference at all in how sweet or salty or bitter the wines tasted from one glass to another (they were able to detect small but “statistically significant” differences in sourness).

The tasters said that the wines tasted somewhat more “pleasant” from the traditional-shaped wineglasses than they did from the square and the tulip shapes: eight percent more pleasant, to be exact. But Hummel says this finding merely suggests that extremes can make a small difference—which basically means that, all things being equal, you might like a Cabernet’s flavors somewhat better if you sip it from a wineglass than from a jelly jar.

scientists have denounced the vaunted tongue map as a joke.

Riedel sounds unmoved. “I don’t know the studies in such detail that I can really comment on them,” he says. As for the tongue map, he cheerfully poo-poo’s it as “not scientifically sound.” So, I had to ask, why does his company continue to cite the bogus tongue map in its brochures and at tastings as one of the key scientific reasons why the glasses “work”? Because, he says, the map makes it “easier to explain” his products. Science isn’t the point, Riedel tells me just before we hang up. “Ask consumers if my glasses make a difference. And the consumers say, ‘Wow!’”

The more I talked with researchers who’ve examined this issue, the more I faced a perplexing riddle: How do we know who is right? Do we believe the thousands of passionate wine lovers whom Riedel has converted? Or do we believe stark statistics?

Scientists say we probably know part of the answer from psychology and medicine. It’s the dynamic that gives rise to the placebo effect. For decades, as you probably know, researchers have found that when you tell patients that you’re giving them medicine, many report that their symptoms are alleviated, even if they’re only taking sugar pills. But don’t dismiss that as just their imag-

even more embarrassing. Brochet and his team sat 63 professors and students in a room, separated by dividers so they couldn’t see each other but they could see the test presenter, who stood at the front. First, the presenter asked them to taste and rate a somewhat infamous mass-market wine that sells for about a euro a bottle. As the subjects swirled and sipped, the presenter did, too, and then he spat into his bucket like a true professional. Moldy, the tasters wrote. Rot. Flat. Hard. Acidic.

Then the presenter asked them to sample a famous wine that sells for 100 euros a bottle. As everybody took their first sip, he cheated a bit—and swallowed. This wine went over big: Fruity, the subjects wrote. Woody. Well balanced.

You’ve probably already guessed—the researchers duped them. The subjects had been drinking the exact same wine, which actually sells for about six euros a bottle.

“Come on,” I ask Brochet, during a lengthy phone call. “Are you saying that most of us can’t tell the difference between a Chardonnay and a Zinfandel? We can’t tell good wine from bad?”

“No, no, no,” he says. “I’m not saying that. I’m saying that expectations have an enormous impact. People can, in fact, tell the difference between wines. But their expectations—based on the label, or

Scientists fooled wine specialists into thinking that a white wine was red simply by adding a tasteless food coloring.

“Here’s the big question,” I ask him. “You say that there’s some difference between glasses with extremely different shapes. But suppose I compare a standard wineglass that I got on sale for \$3.95 with a Riedel that I bought for \$39.95? Would I notice any difference there?”

“I don’t really know,” Hummel says. “This is something we cannot answer from our study.” He pauses, and then shapes the next sentence slowly, as though searching for the most judicious words. “I’m not convinced that very subtle differences between glasses would make a significant difference for untrained wine lovers like me.”

It was time to call Georg Riedel.

I tell him that I have been unable to find a single study that proves his claims—and several researchers have tried. What’s more, world-renowned

ination at work: Studies show that many people respond physiologically to placebos, based on their expectations. In other words, when you tell them that they’re taking stimulants, their pulse and blood pressure actually go up.

THERE MAY BE a few more clues to this puzzle in the wine country of France. Let’s go to the sensory laboratories at the University of Bordeaux. In 1998, a neurophysiology researcher named Frédéric Brochet and his colleagues riled the wine world when they proved that they could fool wine specialists into thinking that a white wine was red simply by adding a tasteless food coloring. That test was widely reported.

But the second part of the University of Bordeaux study is in some ways

whether you tell them it’s expensive, or good, or based on what kind of wine you tell them it is, the color—all these factors can be much more powerful in determining how you taste a wine than the actual physical qualities of the wine itself.”

And now we’re getting to the moral of the story.

Look, Brochet says, he’s never studied wineglasses himself, so he can’t prove what he’s about to say. But the research that he and others have done on the science of expectation convinces him that they’ve found the key: Riedel and other high-end glasses *can* make wine taste better. Because they’re pretty. Because they’re delicate. Because they’re expensive. Because you *expect* them to make the wine taste better.

And that, says Brochet, can make all the difference. 🍷