

MUSIC OF THE SPHERES: THE GLASS HARMONICA

By Elijah Wald © 1996

Gerhard Finkenbeiner was visiting Paris when he saw his first glass harmonica. It was in a museum, exhibited as a curiosity from the 18th century, and the label said little more than that it had been invented by Benjamin Franklin and was favored by Mozart. As a glass blower, Finkenbeiner was fascinated by its gleaming row of crystal bowls and set out to get more information. "I got a book which explained all the hocus-pocus about it, the stories about it having supernatural powers," Finkenbeiner says. "And I said, 'One day I'm going to make one, as soon as I have the time and the glass.' "

Forty years after that first encounter, Finkenbeiner is adding a chapter to the odd saga of Franklin's instrument. Over the last decade, he has established his Waltham glass factory as the world's foremost source for the glass harmonica, or "armonica," as it was originally called. His instruments have been played on recordings and at venues ranging from Cambridge street corners to the stage of the Metropolitan Opera, and his ads on WCRB-FM have made his name familiar to local classical-music listeners. Inspired by his example, other harmonica makers have sprung up in both the United States and Europe, but he remains the only person producing the instruments on a regular basis.

Finkenbeiner rises from behind his desk to welcome a visitor to his factory, which specializes in glass for scientific and technical uses. To his left hangs a portrait of Franklin, with a note tucked in the edge of its frame praising the excellence of Finkenbeiner's instruments, signed in a decent imitation of Franklin's hand. The office walls are adorned with a haphazard mix of patent certificates, commendatory plaques, and pictures of harmonica players with their instruments -- so many that the area over the desk is beginning to look like an impromptu collage.

Finkenbeiner leans forward, talking quickly and enthusiastically, occasionally pausing to sketch a rough diagram. His accent and much of his syntax recall his German background and, with his bright eyes and perplexed, nervous energy, give him the air of a cheerfully eccentric inventor from a children's film.

Though most people think of glass blowing as an archaic skill, Finkenbeiner says that the craft is still in great demand in the scientific world. He is one of some 500 scientific glass blowers in the United States, and his company has almost more work than it can keep up with. "It's different from the old glass blowers, who made their own glass in a kiln and used a metal pipe to make all kinds of goblets and things," he says. "But there are many things we do today: for Raytheon, for MIT, Harvard, and all the research companies around here. It's always one-of-a-kind, and it must be modified, and there the glass blower is very important and rare. We are always busy, because there are so few of us."

When Benjamin Franklin invented the glass harmonica in 1761, glass blowing was still the standard way of producing virtually all glassware. At the time, Franklin was living in England as a Colonial envoy. He spent much of his time consorting with his fellow scientific enthusiasts in the Royal Society, and it was through them that he became fascinated with the musical glasses.

"You have doubtless heard the sweet tone that is drawn from a drinking glass by passing a wet finger round its brim," he wrote to an Italian friend. "One Mr. Puckeridge, a gentleman from Ireland, was the first who thought of playing tunes, formed of these tones. He collected a number of glasses of different sizes, fixed them near each other on a table, and tuned them by putting into them water more or less, as each note required."

Typically, Franklin saw room for improvement. "I wished only to see the glasses disposed in a more convenient form, and brought together in a narrower compass, so as to admit of a greater number of tones," he wrote. Teaming up with a local glass blower, he procured 37 glass bowls, ground them to the appropriate pitches, then threaded them one inside another on a spindle that could be turned with a foot treadle. When a player placed his or her wetted fingers on the edge of the spinning bowls, several notes would be in reach of either hand, making it possible to play chords and complex arrangements.

Franklin called his instrument the armonica, from the Italian word for harmony, and the name was shortly Anglicized to harmonica. He was thoroughly pleased with his invention, declaring, "Its tones are incomparably sweet beyond those of any other." Many listeners agreed. There is a story that, on his return to America, Franklin reassembled the harmonica one night in the attic of his home, and, when he began to play, his wife woke thinking she had died and was hearing the music of angels.

Finkenbeiner, who is originally from Constance, on the German-Swiss border, had grown up hearing about the instrument's unique tone. "I come from a musical family, and in Germany the glass harmonica was still quite well known," he says, pronouncing the name as one word, the Germanic Glasharmonika. "It was still taught in school -- the history of it, at least -- because many composers, like Mozart, loved it for its special sound."

When Finkenbeiner saw the instrument in Paris, he was entranced, though it was 25 years before circumstances allowed him to make his first working model. In the meantime, he devoted some of his spare time to exploring the musical properties of glass. Since the end of World War II, he had been employed by the French Navy, blowing glass for infrared detectors, but he also developed a sideline making glass church bells and, later, glass carillons.

The bells are a quirky invention that would have been right up Franklin's alley. A set in the office, which serves as both alarm and door chime, consists of three glass crosses revolving in a metal case that looks rather like an electric oven. Each cross has a thin glass fiber running through it, which is hit twice in each revolution by a glass bead. The sound of glass on glass, amplified by an electronic pickup, is uncannily like that of a bronze bell.

A walk through Finkenbeiner's halls makes it clear that his interest in the special properties of glass is not confined to sound. Here and there are odd gizmos he has created over the years. Little glass divers, neatly blown in human forms, rise and fall in a pressurized water tank. A glass wheel twirls on a glass thread inside a blown-glass vacuum tube; it has been twirling steadily since 1991, twisting first one way and then the other, but never breaking. "Every few days we have to give it a little push, but it keeps going," Finkenbeiner says. "If it was metal, it would have broken long ago, but glass doesn't fatigue."

The push he gives the apparently delicate object is hearty and offhand, as if glass were the least breakable of substances. Indeed, as he moves through the factory's main room, he handles glass in a way that is rather alarming. He taps thin glass bowls to show their sound qualities; he casually heats a tube and shatters it, by immersing it in cold water, to demonstrate its inferiority to the heat-resistant quartz glass he favors. Warning that there will be a bit of a pop, he even blows and bursts a balloon of glass, smiling as glittering tissues flutter to the floor.

In the workroom, shelves hold stacks of harmonica bowls, each marked with the note it will sound. Finkenbeiner makes the bowls on a large lathe, which holds a 6-foot glass tube. Donning bifocals with welder's glass on the bottom, he sets the lathe spinning and lights a semicircular gas jet, enveloping the tube in blue flame. As it gets hot, the glass glows so brightly that it is impossible to look at it with the naked eye. Through a length of rubber tubing, Finkenbeiner gently blows air into the spinning tube, and the heated section balloons into an ellipsoid bulb that, when cut in half, will form two bowls.

Finkenbeiner cannot control the exact thickness of the bowls, so each must be tested to see which note it makes, then fine-tuned by grinding its sides. Finkenbeiner can get 20 bowls from each glass tube, which gives him a terrific advantage over 18th-century manufacturers like Ferdinand Pohl, the dean of harmonica builders. "He didn't have glass tubing," Finkenbeiner explains. "He had to pick the liquid glass out of an oven and make a tube himself, and then, while it was still hot, he could blow one bulb. But he had to do it all by hand."

Pohl, a joiner from a small town in Bohemia, worked out his own methods for making harmonicas by trial and error, using as a model the glass bells placed over fine clocks. The story is that he spent months constructing his first instrument, and, when he opened the workroom door to announce his success to his wife, a draft slammed it shut and jolted a portrait of St. John off the wall, smashing his masterpiece to bits. A pamphlet by Pohl's grandson describes how "in his despair the unhappy man . . . stamped violently on the poor saint," but, "blessed by nature with a great deal of perseverance," he went on to international success, eventually producing some 4,000 instruments.

Whereas Pohl was inspired by clock bells, Finkenbeiner was spurred by a job he undertook for IBM in the early 1980s. While constructing furnace tubes to be used in making semiconductors, Finkenbeiner had to seal off one end to create a vacuum, then later cut the end off and discard it. It was while looking at the discarded ends that he had an idea. "What we left over was looking

just like a glass harmonica cup," he remembers. "So I started saving these ends. It was quartz, the best-quality glass, and after a year I had almost a hundred different cups. They needed to be tuned, of course, but that gave me the start. I made one harmonica, and, when it was done, I was fascinated by the sound. It was so great. And nobody had heard one, because, in the museums, they don't let you touch them." The harmonica had largely disappeared by the early 1800s, after a vogue of more than three decades. At its peak, it had been among the half-dozen most common instruments for amateur parlor musicians, so popular that the first mouth-organ manufacturers appropriated its name for their product. Its fame was spread by Marianne Davies, an English relative of Franklin's, who quickly mastered the instrument and had several successful European tours. During a residence at the Viennese Imperial Court, Davies was instructor to both the young Archduchess Maria Antonia, better known as Marie Antoinette, and the soon-to-be-notorious hypnotist Franz Anton Mesmer. It was also during Davies' Viennese stay that the instrument came to the attention of the composer whose work would give it lasting fame, Wolfgang Amadeus Mozart, then 13 years old.

The Mozart-Mesmer connection provides an odd byway to the harmonica story. Mesmer was a patron of Mozart's, the first to present an opera by the young prodigy. He was also a harmonica aficionado, and a letter from Mozart's father is highly complimentary regarding both Mesmer's instrument and his playing. Unfortunately, in the next decades he would become known as a wonder-working charlatan with questionable morals, and the harmonica, which he used to relax his patients, suffered a parallel decline in reputation. Its ethereal vibrations were blamed for various nervous conditions, and stories circulated of strange afflictions that beset players and listeners alike.

Some historians have suggested that the problems were real, caused by lead from the glass leaching into the fingers of performers, but others have pointed out that many harmonica enthusiasts, Mesmer and Franklin among them, lived to a ripe old age. A harmonica instruction book from 1788 includes a preface defending the instrument against "prejudices which have crept into people's minds as easily as have its tones." Public sentiment was turning ugly, and, after a child died during a concert in Germany, the harmonica was banned in some regions as a public danger.

Finkenbeiner still sounds a bit defensive when he talks about the rumors. "They would say things like, 'Don't play at midnight, because the ghosts will come out,' " he says, with an air of only half-amused irritation. "They really believed in this, and that's not true; it's just a nice sound."

Despite such worries, the harmonica remained popular into the early 19th century. It reached its highest standing through the performances of Mozart's cousin, the blind virtuoso Marianne Kirchgessner, whose phenomenal technique inspired dozens of composers. Mozart himself, in his last year, composed for her what are still considered the two most important pieces in the glass repertoire, the unaccompanied Adagio in C Major and the Adagio and Rondo for Harmonica, Flute, Oboe, Viola, and Cello.

Even in its waning years, the harmonica's charms were powerful enough to attract major composers. Beethoven wrote a brief piece for it, and Donizetti used it in his 1835 opera Lucia di Lammermoor, though the instrument's bad reputation may account for the fact that it appears only to accompany Lucia's "mad scene." By that time, even such a back-handed compliment was given with difficulty. The composer was unable to find any harmonicist proficient enough to play his score and so was forced to rewrite the part for flute, giving the harmonica a simpler role, providing background atmosphere.

Harmonicas survived for an additional 100 years in corners of Eastern Europe, but the Franco-Prussian War and World War I resounded with great crashes of shattering glass, and the few surviving instruments were relegated to dusty corners in lucky museums. By 1956, when the American organist E. Power Biggs attempted a revival in a concert at the Massachusetts Institute of Technology, the harmonica had become the stuff of folklore. Top glass manufacturers and instrument makers collaborated to build him an instrument that would use a keyboard rather than direct finger contact, but the final product sounded awful, and Biggs ended up playing the Adagio and Rondo on the flute stops of his organ.

A breakthrough of sorts came in 1964, when a German musician named Bruno Hoffmann recorded his Music for Glass Harmonica. In an ironic twist, however, Hoffmann's instrument was not a harmonica but rather its predecessor, the musical glasses, though his were ground to pitch rather than tuned with water. (Hoffmann became a friend of Finkenbeiner's, and the current notes to his recording call his instrument a "glass harp.")

Following Hoffmann's lead, musical-glass players began to pop up on both sides of the Atlantic, but it was only with Finkenbeiner's appearance that Franklin's creation once again moved to center stage. On the second floor of his factory, Finkenbeiner has a room set aside for music, and here one can see the harmonica in all its glory. It is not the only instrument in the room -- there are also two Finkenbeiner carillons and an electronic keyboard -- but there is no question which holds the place of honor.

The harmonica is a lovely thing to look at. The bowls, three octaves' worth, placed one inside the next, form a gleaming, tapered cylinder, the sharps and flats highlighted with gold. Finkenbeiner has replaced Franklin's treadle with an electric motor but has remained true to tradition by mounting his instrument in a fine wooden case.

Though modest about his musical abilities, Finkenbeiner is more than happy to play and is willing to give a visitor a try as well. First, however, he must scrub his hands until they squeak, removing every trace of oil, so as to get the proper friction on the glass. Even the water itself can be important. Depending on its mineral content, it can make playing more or less difficult, and one of Finkenbeiner's early customers, Vera Meyer, has a horror story about giving a concert in a town that had particularly soft water -- she was not able to get a single note out of the instrument.

Indeed, the arcana of harmonica water are subjects unto themselves. Old books insist that the same water be used for washing and playing, and present-day artists often travel with their own distilled water. "In the drug stores of the old time, they had shelves full of glass-harmonica water in bottles," Finkenbeiner says, with evident amusement. "With secret ingredients to play better. It was probably just alcohol, to eliminate the grease. But there were that many glass harmonicas around."

Finkenbeiner uses ordinary Waltham tap water, and, once all the oil has been removed from his fingers, he dips them in a dish that sits handy beside the instrument and begins to play.

Even after hearing recordings and seeing pictures, it is a magical moment. As his fingers touch the edges of the bowls, the music appears out of the air, with no audible attack, no clear beginning or end. It is a sound like nothing else, and, as one listens, all the talk of angelic voices almost makes sense.

Finkenbeiner seems to expend no effort in playing, but the ease is illusory. A novice's touch on the bowls produces only a rather nasty squeak, with a faint after-ring, and Finkenbeiner says it is unusual for a first attempt to yield even this unsatisfactory result. It is an odd sensation as well, a sort of eerie tickling, and it is easy to see how the rumor got started that the vibrations could be dangerous.

Of course, odd vibrations can also be regarded as salutary. Two centuries after Mesmer, Finkenbeiner says he finds that some of his best customers come from the New Age healing community. In the late 1980s, a mystical Lemurian entity named Gurudas, channeling through two American writers, declared the harmonica "extremely powerful to open the chakras" and recommended that players use gem elixirs and flower essences attuned to each note. Soon Finkenbeiner was flooded with letters from people seeking the "spiritual and healing vibration" of pure quartz.

This aspect of his business has Finkenbeiner a bit puzzled, though he is grateful for the custom and has even, at the prophet's suggestion, begun to make quartz flutes. He prefers to talk about the dozens of musicians who play his instruments. Meyer is a close friend, and he keeps in contact with a world of harmonica enthusiasts whose smiling photos adorn his walls. His mail-order catalog includes cassettes and CDs by players like Ken Piotrowski, a New Hampshire pianist and historian of the instrument, and Dean Shostak, who performs in period costume in the taverns of Colonial Williamsburg, in Virginia.

Dennis James, the most visible modern player, also began his career with a Finkenbeiner harmonica, though he has since switched to a custom instrument made by a German associate of Finkenbeiner's, Sascha Reckert. Reckert's instrument has a richer, bassier sound than Finkenbeiner's, which is brighter and louder. James performs regularly with classical ensembles in Europe and in the United States but is best known to American audiences for his frequent appearances with Linda Ronstadt.

The glass-music world is still quite small, but new players and makers are appearing every day. Glass Music International, formed in 1987, sends its newsletter to some 350 subscribers in 14 countries and is organizing a convention to be held in Boston in April of next year. The inventor's gleam comes into Finkenbeiner's eye as he sketches pictures of seraphims, verillons, and other strange new instruments that his fellow glass-instrument builders have been toying with. (The seraphim is a set of pre-tuned glasses, the verillon a set of tuned glass tubes.)

Finkenbeiner is obviously enthusiastic about these developments, and the discussion of glass-working innovations reminds him of his early years as an apprentice. "When you start learning how to blow glass, everything twists," he says. "It looks like a cauliflower or a coil or something, it gets paper thin, and then it's gone. So it takes, depending on the person, something like five years to go through the brain, to put an input so that you can coordinate those movements. It's like playing a musical instrument: You must practice, practice, practice, but then once you have it, it's fine."

His eyes get even brighter, and he heads back to the workroom. Taking a piece of thin tube, he heats it on a burner and blows a perfect bubble in the middle. A quick pull and twist makes an elegant, narrow curve, then another breath produces a tiny bubble, which he quickly pulls off-center. A final twist, and, with a beaming smile, he hands the visitor a going-away present. It is a perfect glass swan.