American Luthier: The Art and Science of Carleen Hutchins

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Carleen Hutchins taught herself acoustical physics, applied it to making a better violin, and then invented a new family of violins.

Editor's Note: Carleen Hutchins won the Acoustical Society of America (ASA) Silver Medal in Acoustics in 1998 for her brilliant contributions to the design and construction of violins. The idea for this article arose during a concert using Hutchins' instruments at the 2019 ASA meeting in San Diego (CA). Subsequently, the editor invited Quincy Whitney, author of a recent award-winning biography of Hutchins (see doi.org/10.1063/PT.3.3468) to submit an author-condensed excerpt of the book as an article for *Acoustics Today*. The book, *American Luthier: Carleen Hutchins — the Art and Science of the Violin* (ForeEdge 2016; see quincywhitney.com), was shortlisted by PEN America as one of the 10 best biographies of 2017 and was awarded the 2019 Science Communication Award from the ASA.

A New Family of Fiddles?

Sometimes the only thing between opportunity and achievement is the missing question arriving at just the right time.

"Can you create a family of violins across the tonal range of the piano?"

That was the question that greeted Carleen Hutchins (**Figure 1**) in the summer of 1958 when Henry Brant and Sterling Hunkins called at 112 Essex Avenue in Montclair, New Jersey. Brant was a composer from Bennington, Vermont, who learned of Hutchins through Hunkins, an accomplished cellist.

Many years hence, Carleen recalled the moment: "Brant asked if I was the 'violin-maker crazy enough' to try an idea he had. He wanted a set of seven graduated-in-size 'violins,' one at each half octave over the range of written music that would carry the sound of the violin with its clarity, brilliance, and power evenly on all four strings. After a half hour discussion, I agreed to try and do what Brant wanted — but it took me ten years."

Figure 1. *Hutchins measuring the thickness of a violin plate, circa 1960. Courtesy of the Hutchins Estate.*

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Tomboy, Bugler, Whittler, Girl Scout

Growing up with no siblings to occupy her days, Carleen befriended the outdoors. The yard at 112 Essex Avenue became Carleen's oasis.

Passion for a toy bugle given to her at age five eventually transferred to a real bugle and then a trumpet. In 1917, at age six, Carleen taught herself to whittle. By the time she was eight years old, she was either building things, taking them apart, or collecting things: moths and butterflies, rocks, leaves, pressed flowers, frogs, toads, and turtles.

In May 1921, Carleen, age 10, attended her first Girl Scout camp at Bear Mountain (NY), a life-changing event for one who would nurture a lifelong passion for the Girl Scouts. In 1923, Carleen became the camp bugler and paid her way through Girl Scout camp by bugling reveille and taps.

Ornithology: First Experience in Acoustics

By the end of high school, Carleen was a master woodworker, first-chair trumpet in both band and orchestra, and a passionate naturalist, with a particular fascination for moths, collecting, categorizing and mounting them in hand-built shadow boxes. She also met her first mentor, Frank Lutz, curator of entomology at the American Museum of Natural History in New York City. In the fall of 1929, at the urging of Lutz, Carleen enrolled in Cornell University (Ithaca, NY) to study entomology.

When she discovered that entomologists spent months studying the insides of a grasshopper under a microscope while biology majors took field trips, Carleen switched her major to botany and zoology and immediately signed up for every course in ornithology. In the spring of 1932, Carleen began following one of her professors, Dr. Arthur A. Allen, into the field to record birdsong using their new parabolic recording system, an experience Carleen cited as the highlight of her college years.

In 1934, after graduation and a year working at the Brooklyn (NYC) Botanical Gardens, Carleen began teaching science at the Woodward School, a progressive school in Brooklyn where she applied the principles of experiential learning to building a science and woodworking program.

A Trumpet for a Viola

In 1938, through a reference by a Woodward colleague, Carleen took the job of teaching science to the first four grades at the Brearley School, a posh private school located on the upper east side of Manhattan (NYC) that possessed a cross-curriculum music program. On learning that some of her Brearley colleagues loved to play chamber music, Carleen accepted an invitation and brought her trumpet along. It did not take long for her friends to point Carleen in another direction. "The trumpet is fine outdoors on the street but not in a New York apartment. How about trying a viola? We always need a viola!"

Baffled by the parts for unfingered trumpet in her first glance at a *Brandenburg Concerto*, Carleen knew the music was beyond her. But she plowed ahead, borrowing a big 18-inch viola from the school closet and began taking viola lessons. This was her first chamber music experience. Eventually, Carleen found the 18-inch viola too much to handle and purchased a smaller, factory-built Hornsteiner viola for $75 from Wurlitzer's. When asked about switching from trumpet to viola, Carleen responded: "The viola is the same pitch as the trumpet, and I wanted to play music. The *sound* is everything!"

A Pig for a Violist

In September 1945, after teaching two years at Public School 33 in the Chelsea section of New York, Carleen returned to Brearley to teach lower-school science. The day before school began, she met Helen Rice, the newly appointed head of the Music Department who had her own agenda about how to engage the interest of Carleen Hutchins.

"I understand you teach science to the younger children and that you keep quite a lot of animals in your science lab," Helen began.

"Yes, I do," said Carleen.

"Would you by chance be interested in a baby pig?"

"Of course, I'd love to have a baby pig!" said Carleen, clearly astonished.

Helen continued: "I will give you the pig if you promise to come play viola with my students after school."

The children named the pig Susie Snowwhite because she was "immaculate and looked as if she was walking on high white heels." Susie was soon shortened to "SUS" by the Latin Department (sus is Latin for pig), a nickname that stuck in more than one way.

Apprentice to Violinmaking: The First Viola

By February 1947, married and pregnant with her first child, Carleen was in great need of something to occupy her mind and hands besides teaching. After close examination of her $75 viola, Carleen decided to try to make one. Astonished, Helen Rice tried to convince Carleen that it was an "impossible task" for anyone untrained in the art of violin making. Hutchins: "I agreed but decided I was going to try and make one anyway."

Encouraged by her husband Mort, Carleen obtained the book *Violinmaking: As It Was and Is* by Heron Allen and a blueprint for a viola and purchased the wood she would need for her first viola. Carleen christened her first viola SUS 1 (**Figure 2**).

Hutchins: "Since there had been a bargain of a viola for a pig, it seemed quite natural the instrument be christened SUS — especially in light of the pig's outstanding voice production, which, alas, was not true for that first viola!" Henceforth, every Hutchins instrument carries with it the prefix SUS, from SUS 1 to at least SUS 485.

One evening in 1949, when Carleen brought her viola to a chamber music evening, Helen was hosting a group of professional musicians playing quartets, among them Broadus Erle, first violinist for the New Music Quartet. Erle was playing a violin made by Karl Berger and suggested that Berger might be willing to take a look at Carleen's viola.

Figure 2. *Carleen Hutchins carving fiddles in her kitchen, circa 1955. Photo by Russell Kingman, courtesy of the Hutchins Estate.*

Carleen recalled her first viola: "It had many coats of varnish, but it had a nice color and played better than the Hornsteiner. I was quite happy with it and really proud of the work."

Berger looked it over, tapped on it, blew inside it, felt it, put a bow on it, and asked permission to help make it sound better. Carleen: "To my astonishment and horror, he took the strings off and the bridge down, took a knife and went all around under the edge of the top plate, then he handed me the pieces. I was so upset I hardly knew what to say. Here was two years' work all back in little bits again!"

Eventually, Carleen's curiosity got the better of her. After the shock wore off, she began recarving the plates, following Berger's instructions. When she took it back to him, she was excited that the reassembled viola sounded a great deal better.

Apprentice to Acoustics: The Experiments

Sometimes the less likely the meeting, the more magical the encounter.

By May 1949, it had been roughly six months since Carleen had taken her first viola to Berger. Helen Rice and violist Louise Rood had proposed that Carleen accompany them to meet Frederick Saunders, a physicist and string player, with orders to bring her precious viola along. (Saunders was a charter member of the ASA and one of its early presidents.)

Saunders tapped around on the instrument, blew in the f-holes, and listened to it. Then he said, "Young lady, I shall be interested to see your next one. At the time, I had no plans to make another one!"[1] Hutchins realized that Saunders had never been able to change the wood of the box or test anything but finished instruments and thought he could use instruments he could cut into. Saunders didn't think much of the idea. "He said that looked like an awful lot of work: 'What luthier is crazy enough to make instruments that would be destroyed?' I said, 'I will!'"[2]

[1] *Carleen M. Hutchins (CMH) Personal Interview, 1997.*
[2] *CMH Personal Interview, 1997.*

Pancake Viola

In the first series of Saunders-Hutchins experiments, Hutchins made a flat-top viola as a way to experiment with certain elements, e.g., bass bar placement; f-hole size, shape and location; different bridges; and different kinds of wood — without having to take the instrument apart each time. Hutchins made bridges from 35 different woods.

Their goal was to attempt to begin to define what a player means by "violin tone": loudness, ease of playing, tone color or timbre, even the way a tone starts. "We did more than a hundred experiments on this box itself — that's what got me excited and got me into acoustics."[3]

Variegated Violas

Hutchins and Saunders completed a long series of experiments with violas of different sizes, from 17 inches to just under 13 inches, whereby each viola was adjusted to have a good loudness curve. By the fall of 1953, Carleen had made 17 violas in all, including 10 "very weird looking" instruments. One reporter described the curious results emerging from the Hutchins-Saunders experiments: "One looks like a child's violin that has been sat on and another has a deep sound box that makes it look almost like a guitar, and still another looks like a stringed cigar box. Yet all sound like violas."[4]

Graphite Epoxy Violin

In the early 1970s, Carleen collaborated with Dr. Daniel Haines at the University of South Carolina (Columbia) in developing an alternative material to replace the spruce top plates in violins and guitars by laminating a piece of fiberboard between two layers of graphite-epoxy.

Acoustically, Hutchins and Haines pronounced their experiments a success because modal analysis showed that the graphite-epoxy "sandwich" displayed similar characteristics to traditional violin tops.

Most important, the graphite-epoxy guitar and violin passed musical muster. "Both the guitar and violin have been received very favorably by musicians and listeners. Numerous judgments established their sound to be indistinguishable from that of fine instruments made with conventional materials."[5]

"Swiss Cheese" Violin

The last experimental violin that Carleen Hutchins created was the most dramatic and memorable. Sometime in the early 1980s, inspired by consultations with acousticians Edgar A. G. Shaw and Arthur H. Benade, Hutchins built the "Swiss cheese" violin. Carleen drilled 65 holes 5 mm apart in the ribs around the entire perimeter of a Stradivari-model violin. She then plugged the holes with corks to test the air resonance inside the cavity of the violin. Experiments with this violin spanned 18 years.

"Le Gruyere" made quite a sensation at the 11th Annual Conference on Acoustics in Paris when Hutchins persuaded German physicist Jurgen Meyer, a fine violinist, to play the violin as she removed the corks one by one. But soon Meyer's skepticism turned to amazement as the sound changed. Hutchins explained: "The relationship of the body cavity resonances to the openings of the f-holes is so sensitive that removing just one or two corks makes the violin sound thin and scratchy. When all the holes are plugged, which loads the ribs with the mass of 65 corks, the violin still has a good sound."[6]

A Feminine Stradivari? Breast Cancer and Viola SUS 23

"What is the feminine of Stradivari? He had pupils and great fame; you will too!"[7] Such praise from Saunders in March of 1953 was both exciting and unsettling for Carleen because she was increasingly torn in too many directions, trying to balance fiddle making with Berger and Saunders alongside a complicated home life.

Hundreds of conflicting air currents swirl inside the violin. The rush of air escaping through the f-holes amounts to a 10 mph wind, most of which escapes as heat rather than sound. But there would be no sound without the escape hatch of the sound holes. By 1956, Carleen Hutchins had so much going on in her life, she felt overwhelmed. With no escape hatch, something had to give.

On December 2, 1956, Carleen sat in room 756 at Columbia Presbyterian Medical Center (New York City), the day before surgery, having stowed viola SUS 23 in her closet.[8]

[3] *New Violin Family Association (NVFA) Newsletter 2, Winter 2004, p. 13.*
[4] *"Violas Product of Montclair,"* Newark News*, November 8, 1953.*
[5] *Catgut Acoustical Society Newsletter 75, November 1, 1975, p. 26.*
[6] *NVFA Newsletter 2, Winter 2004, p. 13.*
[7] *Frederick A. Saunders, Personal Letter to Carleen M. Hutchins, March 9, 1953.*
[8] *Family Log, II-103.*

The diagnosis was breast cancer, although it was never named in the family logbook. Carleen had long ago concluded that her breast cancer was evidence of remorse about having to choose between a career (several good job offers) and motherhood. "This was 1945–1946. I made a list of what would happen if I took each job — and I figured I couldn't stay married. I went back to Brearley and was miserable there because I knew what I could have done."[9]

Through her surgeon, Hutchins learned that her anesthesiologist, Dr. Virginia Apgar (see en.wikipedia.org/wiki/Virginia_Apgar), played viola! On the night before the operation, Apgar poked her head around the corner to meet her patient.

Before they even discussed the upcoming operation, Carleen went for the jugular: "Dr. Haagenson suggested you might be interested in one of my violas; it's in the closet. Would you like to see it?" Where upon Apgar took up SUS 23 and spent the rest of the time playing it right in the middle of Clarkman Pavillion, much to the enjoyment of nurses on the floor.[10] Later, Apgar admitted that she had been so distracted with playing the viola, she had to return to room 756 to finish gathering her patient's medical history.

The next morning, on Monday, December 3, 1956, on seeing the results of the biopsy, Haagenson performed an immediate mastectomy.

Theft in the Hospital: The Apgar Quartet

In the spring of 1957, during one of her post-op check-ups, Carleen got up the nerve to ask Apgar about a piece of wood she had seen in the hospital, the curly maple shelf in the

[9] *Interview, D. Quincy Whitney (DQW), Notebook 1, 1.17.*

[10] *Interview, DQW, Notebook 1, 1.17.*

***Figure 3**. A violin octet is a matched consort of eight violins across the range of a piano, each instrument toned and tuned like a violin. The octet instruments, from largest to smallest, are contrabass (large bass), small bass, baritone, tenor, alto violin ("vertical viola"), mezzo (most like the traditional violin), soprano, and treble. Modified from an image provided courtesy of the Hutchins Estate.*

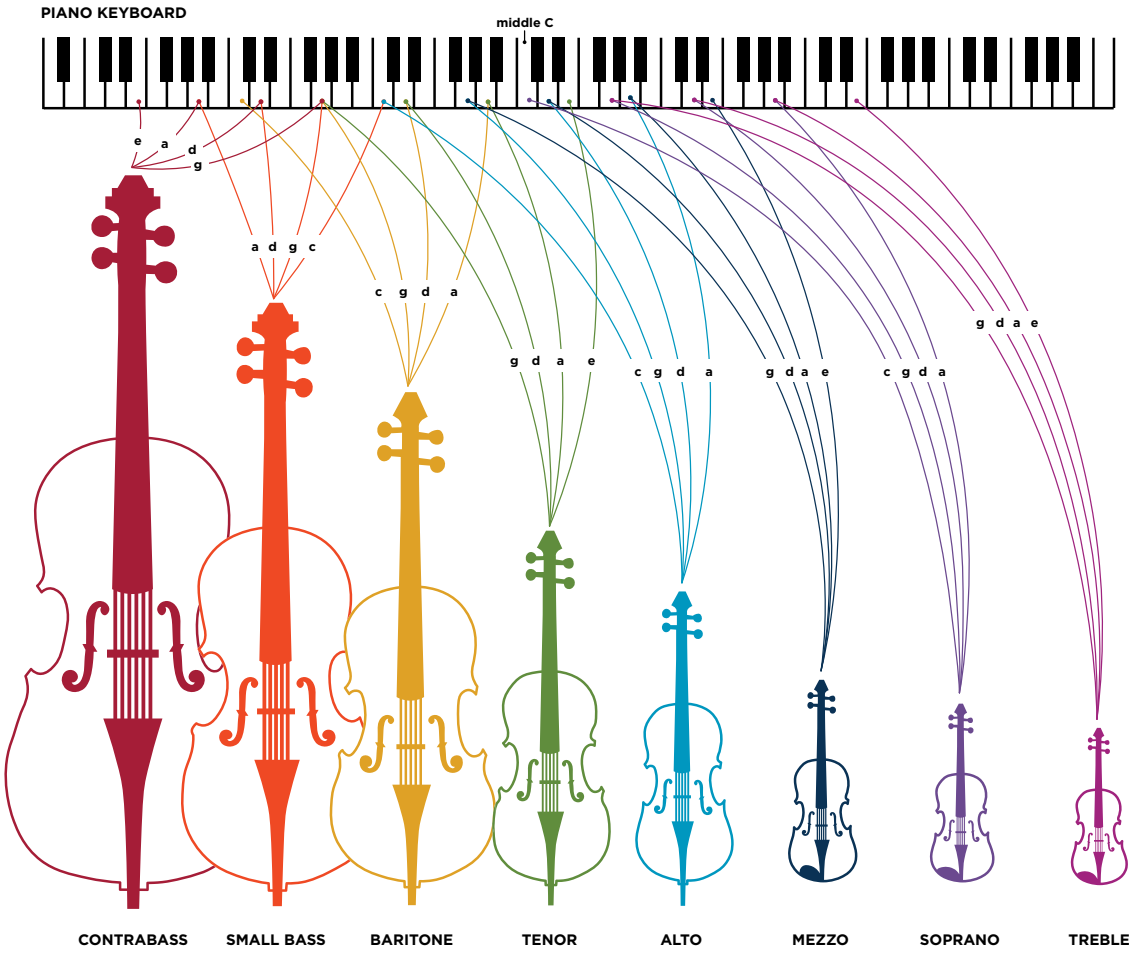

Figure 4. *The Hutchins violin octet in the living room of 112 Essex Avenue (Montclair, NJ), circa 1965. See* ***Figure 3*** *for names of the instruments. This photo is the cover of* Research Papers in Violin Acoustics 1975–1993*, edited by Carleen Hutchins. Courtesy of the Hutchins Estate.*

Harkness Pavilion first-floor telephone booth. After discussing all options, Apgar advised that the only way to get it was to steal it!

The nocturnal shelf-stealing escapade proved the beginning of a close friendship between Hutchins and Apgar. Apgar, who had no family of her own, soon became an adopted member of the Hutchins family. In fact, Apgar asked Hutchins to teach her to make a viola. It was the first time Hutchins taught a pupil violin making. Hutchins helped Apgar make a violin, a mezzo, and a cello that Hutchins finished when Apgar died suddenly in 1974. These four instruments became known as the Apgar Quartet and are presently housed at Columbia Presbyterian Hospital.

A New Family of Fiddles: The Hutchins Violin Octet

A violin octet (**Figures 3** and **4**) is a matched consort of eight violins across the range of a piano, each instrument toned and tuned like a violin. The octet instruments, from smallest to largest are treble, soprano, mezzo, alto, tenor, baritone, bass, and contrabass.

Alto Violin

In early 1959, by the time composer Henry Brant knocked on her door at 112 Essex Avenue, the "New Jersey housewife violin maker" had made 50 instruments, mostly violas, including 10 violins and 1 cello.

Carleen made the first "new" violin, the alto violin, by cutting down an enlarged viola that had been a cut-down 16th-sized child's cello. When Hutchins and Saunders found the air resonance was too low because of its deep ribs, Hutchins cut the ribs down two inches at a time. Hutchins and Saunders found that when the main wood resonance and the main air resonance occurred on the two open middle strings, they were pleased with its sound.

Just at this moment, Louise Rood had sent Carleen a copy of a brochure entitled *Filling in the Gaps in the Violin Family* by Connecticut luthier Frederick Dautrich. When Carleen found and phoned Jean Dautrich, she discovered that he had all his father's instruments. On May 16, 1959, Hutchins and Apgar ventured to Torrington, Connecticut.[11]

On arrival, Hutchins and Apgar were amazed to see the Dautrich instruments spread across the living room: violin, *Vilonia*, *Vilon*, cello, *Vilono*. Pleased with the sudden interest from Hutchins, Jean Dautrich agreed to lend a *Vilonia*, *Vilon*, and *Vilono* to Hutchins with insurance values of each: *Vilonia*, $200; *Vilon*, $200; *Vilono*, $350; and the bass bow, $300, for a total cost of $780. Right then, Hutchins offered to purchase them.

Tenor Violin

In late 1960, as Hutchins contemplated the next octet violin, the tenor, she reasoned that the tenor should ostensibly be twice the size of the violin. But when she and Saunders worked it out, they discovered they did not have to make the body twice as long as the violin to get the desired pitch. Size in relation to the tuning was what mattered. To her delight, Hutchins discovered that the Dautrich *Vilon* was close to the desired tenor size, but the ribs were too deep. So, she cut down the ribs, working trial and error to get the right air mode. Eventually, when she determined that the first tenor was too short to get the optimal air mode, Hutchins redesigned and built a slightly larger tenor from scratch.

Not everyone in Carleen's circle liked Brant's idea of a new violin family. Both Saunders and John Schelleng, a sound engineer and cellist working on an article about the violin as a circuit, doubted that Hutchins could make stringed instru-

[11] *Letter, CMH to Fryxell, April 1, 1965.*

ments with good tone and playing qualities. Hutchins asked Schelleng to try her "new" alto violin. Hutchins: "When he put a bow on it, he was amazed and excited because it had wonderfully expressive sounds especially in its lower range than we had ever heard from a viola before. Saunders and Schelleng became convinced I had something valid to work with, so we set to work to try and develop the other instruments."

Soprano Violin

The next violin was the soprano. Hutchins made the soprano from a three-quarter violin that Henry Brant had tried unsuccessfully to tune in that range. Hutchins: "The first soprano worked out pretty well but looked funny and didn't have the full sound it ought to have had. I don't think we got the plates tuned right at that range at the time. The other soprano violins were lots better than that first one."

Baritone Violin

Next came the baritone. Hutchins discovered that Dautrich had tuned his *Vilonio* to the right wood resonance for the baritone, so they moved the *Vilonio* up to this frequency. The length proved right, and it had a very good sound in that range. Later, Hutchins learned that she and Schelleng had made a mistake with the air mode in the baritone. "Initially, we got the wood mode right, but we had the Helmholtz mode way too low." Hutchins was always quick to credit Dautrich: "His work literally saved us years of cut and try."[12]

Small Bass Violin

The small bass violin was developed next. Aspiring luthier Gordon McDonald visited 112 Essex Avenue and told Carleen about Donald Blatter, a retired engineer and bass maker who, on learning about the new violin family, offered to let Hutchins use bass parts he had already constructed, parts Blatter patterned after a slope-shouldered Carcassi Italian bass arched to Hutchins' specifications. Hutchins said: "Without the help of Donald Blatter, we would have been many more years working out the new violin family."[13]

Mezzo Violin

In 1961, Helen Rice hosted two early concerts featuring the first five octet violins: soprano, alto, tenor, baritone, and small bass. During one of these early concerts when violinist William Kroll was playing his Stradivarius alongside the alto, tenor, and baritone, pianist Rosita Levine, sitting in the audience, said to Kroll: "Fritz, I can't hear that Stradivarius of yours. What's the matter?" Levine was questioning why she could not hear the Stradivarius next to the Hutchins octet violins.

The incident got Carleen thinking that perhaps the traditional violin was no longer compatible with the new violins; it was not loud enough, for one thing. As a result, Hutchins and Schelleng began designing a "new" slightly larger violin that would become the mezzo, the violin closest in dimension to the traditional violin.

For the mezzo violin, nicknamed the "he-man" violin, Hutchins added violin strings to a 16-inch viola-patterned instrument that she had already made with violin resonances. To make it more playable, Hutchins later designed a 15-inch mezzo. Hutchins: "By measurement, this instrument has twice the power output of a normal violin. I sold it to a concertmaster some years back when we first developed it. He said he has to play every note correctly because everyone can hear him!"

Contrabass Violin

The next challenge was the big contrabass violin. To make the biggest fiddle, Hutchins studied the work of Felix Savart and "made the dimensions proportional. We made the resonant frequencies proportional to its tuning. If it were dimensional only, the large bass would have had to be 6 times the length of the 14-inch violin or 7 feet tall and the body length of the treble only 7 inches."[14]

Creating the contrabass was truly a team effort. Schelleng figured the scaling; architect Maxwell Kimball helped develop a violin-shape design; Carleen, aided by Donald Blatter, provided the craftsmanship; and Stuart Hegeman produced the huge electronic testing equipment powerful enough to shake the huge 51-inch plates of spruce and maple.[15]

Treble Violin

The treble violin, nicknamed "treble trouble," was the last and most difficult to make because there was no prototype for it. Using the design of a quarter-sized child's violin, Hutchins and Schelleng figured a method to make deep ribs and then

[12] *Letter, CMH to Fryxell, April 1, 1965.*

[13] *Schumacher Tape D, D.13.*

[14] *Hutchins, "Acoustical Parameters of Violin Design Applied to the Development of a Graduated Series of Violin-Type Instruments," CMH Lecture Delivered at the ASA Meeting, New York City, May 1963*

[15] *Hutchins, "The New Contrabass Violin," March 4, 1966, 5.*

put holes in the ribs to raise the frequency of the enclosed air.[16] For the first prototype, Schelleng eventually hit on using aluminum ribs.

The Violin Octet

According to Carleen, four areas of research had made the new violin family possible: the placement of the main wood and air resonances, tap-tone relationships, methods of putting resonances at desired frequencies, and dimensional scaling.[17] Carleen: "We did the right thing for the wrong reason, which was luck. We thought we were scaling to the length of the wood of the box and actually we were scaling to the air inside the box."[18]

The premiere concert featuring the new violin family took place on May 20, 1965, at the 92nd Street YMHA (New York City) as part of the *Music in Our Time* series developed and conducted by violinist Max Polikoff. Henry Brant wrote a special piece for the new violin family, featuring each of the eight violins in expressive solo passages as well as in ensemble.

Conductor Leopold Stokowski and "The Monster" Viola

The morning after the May 20, 1965, debut concert of the Hutchins violin octet at the 92nd Street YHMA, Carleen got a phone call from the infamous conductor Leopold Stokowski, who had been in the audience. Stokowski was all excited about the sound of alto violin because it had "the sound he had always wanted from violas in his orchestra." But because he could not interest violists in playing a vertical violin, he asked Hutchins to design an ergonomically workable viola with the same sound that could be played da braccio (with an outstretched arm).

In 1969, Carleen met up with Stokowski to unveil her "monster," a cornerless viola. Hutchins turned the strings and the whole playing arrangement sideways so that the left hand could get with ease up to the bridge. But this design resulted in an awkward imbalance that meant that the viola flopped around despite efforts to keep it steady.

On January 27, 1969, Stokowski wrote Hutchins: "We tested three violas today, your 'monster' and two made by Coggin, all of them extremely fine tone. Your instrument has wonderful depth of tone and yet brilliance above deep tone. Musically, it is extremely great." Carleen recalled: "Stokowski had a good sense of humor. He said that the sound of it was very great, but that it was hard to handle, that the players didn't like it — and if you can't suit the players, you are out of luck."[19]

Scientific American *and the Catgut Acoustical Society*

In November 1962, to the great surprise of Hutchins, *Scientific American* published "The Physics of Violins," a groundbreaking cover article by Carleen Hutchins that featured extensive illustrations of "The New Violin Family." In addition, the cover was a stunning original painting by scientific illustrator Walter Tandy Murch depicting one of Carleen's basement laboratory experiments, a violin hanging vertically in a vibration test chamber, certainly not a traditional position for a violin! (Note that a Murch painting is also on the cover of *American Luthier*, the book from which this article is excerpted.)

Carleen stated her manifesto: "I believe that, without ignoring the precious heritage of centuries, we really ought to learn how to make consistently better instruments than the old masters did." Not only had Carleen Hutchins sparked the conversation about violin acoustics, she had done so with a bang. Carleen received more than 200 letters from luthiers and physicists from all over the world. This article put Carleen Hutchins on the map in the violin world. As of 1979, *Scientific American* had distributed nearly 30,000 reprints.

As a result of such worldwide interest, this article spurred the formal organization of the Catgut Acoustical Society. On Saturday, May 16, 1963, the Catgut Acoustical Society (see catgutacoustical.org) was born when 12 members of the original technical group gathered around the ping-pong table in the side yard at 112 Essex Avenue, talking violin acoustics all day around a jug of wine and lunch.

The Catgut Acoustical Society created an international community devoted to stringed instrument acoustics by producing and mailing newsletters twice yearly to members around the world for the next 30 years.

The Hutchins Consort LIVE

On January 18, 2000, in the Barclay Theater in Irvine, California, Carleen settled into her chair in the second row to hear a concert she had dreamed of for half a century, the inaugural

[16] *Interview, Schumacher tape D, D.13-D.14.*

[17] *Hutchins, "Acoustical Parameters of Violin Design Applied to the Development of a Graduated Series of Violin-Type Instruments," CMH Lecture Delivered at the ASA Meeting, May 1963.*

[18] *Interview, Notebook 2, 13.12.*

[19] *Hutchins Interview, January 22, 2002, Notebook 3, Youth Tape 9, 63-65.*

concert of The Hutchins Consort (see hutchinsconsort.org), the first American octet, the only professional ensemble in the United States to perform on a Hutchins violin octet, a concert inspired by the passion of one bass player, Joe McNalley (**Figure 5**).

This was no small accomplishment. Over the past 30 years, various efforts to sustain enthusiasm for the violin octet had failed in the United Kingdom, Sweden, Russia, and Iceland.

Besides being a gifted bassist and widely versatile musician, McNalley was above all an eternal optimist. Beyond musical inspiration at home, McNalley studied at the New England Conservatory (Boston, MA) and then the University of California, San Diego (La Jolla; UCSD), mentored by two celebrated bassists, David Walter and Burt Turetzky, both gifted teachers and maverick professionals pushing the solo potential of their instrument at a time when no one else was doing it.

In 1983, when UCSD hosted the ASA Symposium, Turetzky organized a concert featuring the Hutchins violin octet, performing to a packed house of 500 that left people standing in the aisles cheering. Still, Turetzky found it increasingly difficult to sustain interest among players: "The octet violins are quite fantastic, but one of the things they say in an interview of a famous player is what instrument do you play? — meaning what *Strad* do you play? That's prejudice. Carleen punched a hole in it, but it's got to be the players who say, 'Listen to this!'"

That's exactly what happened to McNalley. He recalled the first time he played a Hutchins contrabass in an orchestra. "I played the Hutchins big bass, felt the earth move beneath my feet, and saw an entire first violin section bounce out of their seats at the low-G sound of this bass playing the Brahms First Symphony."

Over the next five years, McNalley built a contrabass violin and began consulting with Hutchins over the phone. When he learned that Hutchins had a complete octet at 112 Essex Avenue, McNalley began to work out a two-year plan to purchase an octet. McNalley: "Within just two days, I had four of the best players in southern California interested in the octet. The stars aligned. I thought it would be two years planning and instead in it was just two months!"[20]

[20] *Interview with McNalley, October, 2011.*

Figure 5. Seated, left to right: *AJ Fanning playing alto violin, Peter Jacobson playing tenor violin, and Sarah O'Brien playing baritone violin.* ***Standing, left to right:*** *Andres Martin playing contrabass violin, Bethany Grace playing soprano violin, Steve Huber playing treble violin, Batya MacAdam-Somer playing mezzo violin, and Joe McNalley playing bass violin. Courtesy of the Hutchins Consort.*

Democracy of Sound: A New Palette of Sound

Just as Carleen Hutchins busted apart the long-held traditions and paradigms of the violin world, her violins do the same thing in the violin octet. In terms of the ensemble dynamics, Hutchins did nothing less revolutionary than invent a "new democracy of sound." Each octet violin has its own unique sonority, resonance, and range, yet all eight violins are tonally matched. Consequently, under the direction of Joe McNalley, all eight violins share the limelight, alternating roles that include carrying the melody and blending harmony. Original compositions and arrangements initiated and performed by the Hutchins consort range from medieval and renaissance music to jazz and contemporary works, with no preordained roles for any musician. This open concept revolutionizes our experience of traditional string ensembles, expanding options for duos, trios, and quartets within the consort. In addition, the violin octet presents a totally "new palette of sound," a "mini-orchestra," in which the audience hears sonorities, colors, and tonal combinations never heard before in a string ensemble, including truly amazing pizzicato!

Acoustical Society of America Honorary Fellowship: Saunders and Hutchins

In the spring of 1954, Saunders received news that he had been selected to receive an Honorary Fellowship, the highest award given by the ASA. When he learned of winning the ASA honor, Saunders was suddenly reluctant to include Hutchins, saying: "You don't need to come to the meeting—you probably wouldn't understand most of it."[21]

In 1998, Carleen Hutchins was awarded the same honor as her mentor, the first and only woman to receive it.

Violin Parts

In a park in Martigny, Switzerland, a sculpture by Arman entitled *Contrepoint Pour Violoncelles* (see bit.ly/2Zfdtbj) looks like a totem pole of violin parts, a visual metaphor synecdoche for the life and work of Carleen Hutchins, a catalyst who changed nearly every aspect of the violin world.

[21] *Interview, Fall 1997.*

To meet some members of the Hutchins Consort and hear some of their music, see the following links.

Meet the Hutchins Consort: youtu.be/Iev1DNVeBcM.
Excerpt from Hungarian Rhapsody: youtu.be/vRydzJUra1I.
"Summertime" (Gershwin): youtu.be/YpfhBB9b2Aw.

BioSketch

Quincy Whitney was the primary arts writer for the *Boston Globe New Hampshire Weekly* for 14 years. Whitney is a Eugene O'Neill Critic Fellow, a Salzburg Seminar Fellow, and a Metropolitan Museum of Art Research Fellow. Her award-winning biography, *American Luthier: Carleen Hutchins—the Art and Science of the Violin*, selected by PEN America as one of the 10 best biographies of 2017, was recently awarded the 2019 Science Communication Award by the Acoustical Society of America. The Hutchins Consort, now celebrating its 20th anniversary, is the only professional ensemble in the world that performs on the Hutchins violin octet.