

Edgar Villchur 1917-2011

Eulogy by Mead C. Killion, Ph.D., Sc.D.(hon)
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I met Edgar Villchur in 1968 at an Audio Engineering Society meeting in New York City, in front of the Bruel & Kjaer booth looking at test equipment. We somehow struck up a conversation about the proper way to measure the real ear response of earphones, and each of us quickly concluded that the other was an idiot. We finally realized that wasn't quite true, and he decided that it would be a kindness to show this young kid from Battle Creek, Michigan some of the big city. He asked if I had ever been to a NY Jewish delicatessen, which I hadn't. As we were walking toward the Carnegie Deli, he said "I should tell you about Jewish waiters. Their job is to be as rude as possible to the customer, and the customer's job is not to back down." When we were seated, the dialog started: "What'll it be, gentlemen?" Eddie said "I'll have plain cheesecake." To Eddie's delight, the waiter, visibly insulted, said "So what's wrong with the cherry cheese?" Eddie played his role and said, "Probably nothing, but I'm a very difficult customer." To which the waiter said "I vuldn't ahgue!"

Villchur made his living as a writer before he and Henry Kloss founded AR. His writing principles were straightforward: Make the literal meaning of words and sentences identical to the context meaning. Trim. Shorten. Cut out repetition. Write for Clarity. Don't use mathematics to impress the readers – they won't be impressed. (Over the years, I sometimes heard Eddie comment about a writer who used "mathematical masking" to hide the fact that he had little real understanding of his topic.)

Villchur published some 150 papers and several books. He was once asked to contribute a chapter to the Harvard Project Physics textbook, alongside other masters of clear writing such as Albert Einstein, James Clerk Maxwell, Richard Feynman, and Arthur C. Clarke. Equally impressive, he successfully published 22 letters-to-the-editor in the NYT. Some writers spent a lifetime trying to get *one* such letter published.

For his scientific papers and his many scientific contributions, the American Auditory Society gave Eddie its Lifetime Achievement Award in 1995.

Once we became friends, Eddie was kind enough to edit most of my scientific papers. After nearly 40 years of editing, he finally gave me a high compliment: "I didn't find much wrong with that manuscript."

For each of the 75 ads he wrote for Acoustic Research, he applied one rule: "Every ad should provide accurate information on the basis of which the reader would be induced to try your product." It was a question of morality to him. **But**, he would add, once you met the **accuracy** criterion, the ad should grab people's attention. Accurate, truthful, and eye catching.

Eddie never wanted to manufacture loudspeakers; he wanted to license his new "acoustic suspension" loudspeaker design and go back to teaching and writing.

Fortunately, he was unable to find a licensee. You've all heard the stories, I would guess. The president of Bozak wouldn't even listen to it, saying "It's impossible to get that much 1:35 –3:17 bass out of a small box." The president of Electrovoice said "If such a thing were possible, our engineers would have discovered it!" The funniest to me was a writer who explained that the reason it was impossible to get real bass out of a small box was that the wavelength of sound at 30 Hz was too large to fit in such a small cabinet. By that reasoning, such a sound wouldn't be able to come out of **any** practical loudspeaker cabinet, because the wavelength of sound at 30 Hz is 37 feet! We can uncover a disappointing fact by that same reasoning: A 30 Hz sound can't fit in any living room.

In the early years, Villchur combined his AR1w woofer with a Janszen tweeter, which comprised five flat-plane radiating elements around a portion of a circle. Of course, each of those produced a progressively narrower beam with increasing frequency, as was readily apparent if you stood close by. Out in the room, however, the sound was quite uniform. A 6 dB per octave rising response in the drive compensated for the beaming, and the room reflections smoothed out the directivity.

There was no inherent advantage to compensated beaming, of course, and Villchur's second major contribution was a dome tweeter driven by a large voice coil at the perimeter of the half-sphere dome. This gave greatly improved dispersion. The off-axis response was nearly identical to the on-axis response out to 60 degrees, and that was true out to 16 kHz.

By 1967, Eddie decided there were no important problems left to solve in high fidelity reproduction, and he saw hearing aids as the next unsolved problem to tackle. He formed the Foundation for Hearing Aid Research and from then on worked 1:41 – 4:58 out of a well equipped lab in several rooms in the back of the Villchur home in Woodstock, NY.

His most important publication was his 1973 paper on multiband compression. That is one of the most often cited papers in hearing, referenced in over 170 other publications. He followed it up in 1974 with a paper describing an electronic simulation of what it sounded like to someone with a hearing loss listening a) without a hearing aid, b) with a traditional hearing aid, and c) with the two-channel compression hearing aid he had devised. (<http://www.etymotic.com/publications/erl-0133-1974.pdf>) He convinced the Journal of the Acoustical Society Journal to bind a 33 1/3 rpm Soundsheet into each copy of one month's journal, so readers could hear the differences for themselves. (<http://www.etymotic.com/publications/Villchur1974Soundsheet.mp3>)

His multi channel compression amplified only soft sounds, leaving loud sounds unamplified or amplified much less. It was a major breakthrough, and it is now almost impossible to find a hearing aid that doesn't incorporate his compression.

Edgar Villchur brought about fundamental and permanent changes in two different fields: Acoustic Suspension and Dome Tweeters in Loudspeaker, and wide-dynamic-range compression in Hearing Aids.

I think a large part of Villchur's success was his passion for presenting scientific truth so it could be easily understood. I finish today with a excerpt an example of his ability to convey information simply.

DR Moran recently commented: Edgar Villchur had no sympathy for audio's penchant for untested subjectivism. He once concluded an Acoustical Society of America talk by pointing out that, and I quote: "Scientific method allows investigators to form hypotheses in any way they please: out of a cold assembly of facts, intuition, or a drunken stupor. Once a hypothesis is proposed, however, it must be demonstrated rigorously. The audio discipline needs to be brought back to the world of reason."

For 40 years I was privileged to have Eddie as a friend and mentor.

<http://www.aes.org/historical/oral/?ID=39> and see similar Villchur oral-history videos.

Also search: Google villchur-loudspeaker-**what-counts** video (first web result)

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