Sound & Vibration

Tech Science Press

DOI: 10.32604/sv.2022.025691

EDITORIAL

Meeting Leo Beranek, Engineer and Scientist

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Received: 24 July 2022 Accepted: 26 July 2022

One of gurus in the field of acoustics and vibration was Leo Beranek, an engineer and scientist born in the family of a farmer who came to USA from Bohemia (now a part of the Czech Republic). Several generations of vibroacoustic engineers studied a lot from his books and utilized the measurement techniques invented and implemented by him.

I spoke with Beranek at the Acoustics Congress in Montreal in June 2013. He was then 99 years old and stood, leaning on a walker. When I introduced myself, describing in a few words my research in building acoustics, he quickly recollected my article published in Journal of the Acoustic Society of America nine years ago. It was devoted to the 'niche effect' which plays an important role in sound transmission measurements at low frequencies.

"I read with great interest your paper," seeing my surprise, he said. "You not only designed and conducted the experiment well, but also produced a simple physical interpretation… By the way, it looks like you are originally from Russia. I have been there with my wife and son a long time ago, on the next year after the World Youth Festival. We visited Moscow and Leningrad.

"So, you were there in 1958. Do you speak Russian?"

"I know some words but I can't speak," he smiled. "For example, my last name is translated to Russian like a little ram… So, I came with my family to the Soviet Union on the invitation of professors Andreev and Brekhovskikh from the Acoustic Institute. Very nice people. They met us at the airport and took to the hotel. Brekhovskikh immediately borrowed me several hundred rubles as he found out that I had no Soviet money. Did you by any chance meet them?"

"No, I didn't, but Professor Rybak, my postgraduate advisor, and Professor Naugolnykh, his friend, worked with them. Besides, I read the Brekhovskikhs' monograph 'Acoustics of Layered Media'."

"This book is widely known all over the world because it was also translated into English," Beranek confirmed. "However, it was written at a high mathematical level which is not comprehensible to most practical engineers. In my books, I used to simplify mathematical models as much as possible, so that practitioners can use them. By the way, my book 'Acoustic Measurements' was translated into Russian and first published in the USSR without my knowledge."

…Not only architects but many various engineers have already showed great interest in acoustic devices and measurements. In particular, because many missiles in all the "nuclear" countries were "hidden" underwater: giant submarines, secretly plowing the seas and oceans, have become the most reliable platforms for global weapons, and special acoustic devices have become their main underwater ears and eyes. On the other hand, the submarines had to become very quiet and invisible to other people's sonar.

But I preferred not to discuss this sensitive issue with Leo…

"I learned a lot from your book," I said. "It was an excellent guide for students and engineers."

"To my pleasant surprise, the Soviet publishing house paid me a fee, fifteen thousand dollars in tendollar bills. I needed a suitcase to take them away. We spent most of this money paying for hotels and food, as well as buying antiques and an expensive fur coat for my wife. She joked: from the very beginning she believed that she had married a prince!"

"But what did you do in science during the trip? Did you lecture or was involved in specific research?" "I was offered to deliver three lectures, including one on the acoustics of concert halls. After that I was introduced to David Oistrakh, the world famous violinist, about whom I had heard a lot before. Together we visited the recording studio where he, accompanied by the Moscow Philharmonic Orchestra, performed Beethoven's Violin Concerto. There were only four spectators in the hall: I and three recording specialists. Then Oistrakh asked me to compare the two different recordings of this concerto. One of them sounded slightly better to my ears, but I was not completely sure and therefore looked at the microphone layouts in both cases. Upon analyzing them, I was convinced of the correctness of my first assessment. It turned out that I resolved the dispute between Oistrakh and those recording specialists in favor of the famous musician!"

"I like the anechoic acoustic chambers made by the Eckel Industries," I said. "As well known, the first models were designed and implemented with your participation."

"It was not only interesting but also a very important team project," Beranek confirmed. "By the way, the name 'anechoic' for that project was coined by me. Right brand names help in finding optimal engineering solutions. In the first anechoic chamber built by us, I tested and adjusted powerful loudspeakers imitating the roar of American tank engines. They were used to confuse the German generals on the Western Front in Europe. Later I was sent to the Pacific Ocean with the goal to improve the intercoms for our naval pilots and optimize the Navy radars for the early detection of Japanese aircraft. It was even a more critical project because the kamikazes inflicted considerable damage to the American fleet."

Beranek paused, as if remembering the tragic events of the war, so I turned our conversation to a more amusing topic.

"What is your best guess for the following engineering issue, Leo?" I asked. "A few years ago, 'Eckel Industries' made for my company an anechoic chamber but with two doors instead of one. The doors were installed in different walls. Why do you think it was done?"

"Thank you for believing that I am still able to solve engineering problems," Beranek smiled. "Now I am the oldest person at all acoustic conferences, so many people here might consider me a living museum exhibit or, as they say in Russia, a wedding general."

He said the last two words in Russian, winking at me, and continued.

"Possibly, your technicians suffer from claustrophobia (the fear of being locked up in small enclosures)," Beranek suggested. "Your intention was to help them by making an emergency door… However, it may be a trick here that is not clear to me now."

"You are right. It was done to protect people in case of powerful earthquakes," I explained. "If the upper structures of the building fall on the chamber, its only door can be jammed. In this case, the people may be locked inside and die from suffocation and fires. The second door will give them an extra chance."

"How I forgot that you live in California now!" Beranek laughed. "I like your articles for practical engineers in the 'Sound and Vibration' magazine". Relevant, useful, and engagingly written. Are you planning to publish a book? Not yet? Of course, the work is huge but the younger generations need our knowledge. As for me, I plan to write a new book. There are some interesting ideas…"

Leo Beranek did not finish this book in the remaining three years of his life. But as I heard, he worked on it almost to the very end.

Leo Beranek (Right) and The author (Left)