**Disney Imagineer Helps with Hart Hall Sound**

*an interview with Robert Bronsdon by Hart of the Matter editor Bill West*

As mentioned in this issue's *Happenin's 'Round the House*, Hart Hall is the “economic engine” of Hart Park, providing a wonderful meeting place for conferences, events and even weddings. But, it was not always that way. When Hart Hall was first enclosed, the acoustics in the room made it nearly impossible to use. To be heard, you needed to shout, and even then the echoes made it difficult to be understood.

In steps a Disney “Imagineer” – a term Walt Disney coined to describe the imaginative engineers and artists who made the rides and attractions at Disneyland, and to this day design and build what you see there, as well as 11 other Disney theme parks around the world.

The Imagineer who helped us is named Robert Bronsdon. Bob, recently retired, donated his time and skills in 2009 and provided the solution that helped make Hart Hall what it is today... In this interview, we learn more about Bob's contribution.

**FOHP:**  Thank you Bob, for being here! First off, what was wrong with Hart Hall when we first asked you to come take a look... or rather, a listen?

**Bronsdon:**  Hart Hall, when it was originally built, probably had adequate thermal insulation, but it didn't have any sound absorption. Sound absorption in acoustical spaces like a hall is important because that's what keeps the sound from returning back to the listener, over and over again. So what happens is that, every time a word is spoken in the Hall it goes off and it hits something and it bounces back and it eventually gets back to you. So you hear it the first time, then you hear it a second time, third time, and so on, up to hundreds of times in a place like Hart Hall. This is because there is nothing to absorb the sound. It didn't matter whether it was a person speaking, or speakers for a band or someone with amplified speech, because every surface in the Hall was returning an echo.

**FOHP:**  So, what did you decide to do?

**Bronsdon:** The thing to do with Hart Hall, or any hall like that – and there are many... churches are often like that – is to absorb the sound on the first bounce. So that's the goal.

**FOHP:** When you arrived at Hart Hall, and I was there, it was interesting to watch you work. Can you describe the process you used to evaluate the area.

**Bronsdon:**  When I walked into the Hall, I clapped my hands and could hear the reverberation. Now, some reverberation is acceptable, so I had to make a judgment on how many echoes I heard. In a space like Hart Hall, you typically hear echoes off the end walls nearly two times a second. In a smaller space like a bedroom, it will sound like a buzz, because the sound is echoing back and forth very quickly. In this particular case, the tricky question was where to add the sound absorption material, because that material can be expensive, and can also detract from the appearance of the space. Those two reasons are often why sound absorption is left out of the building when it is built. In a house, your furniture and the carpeting help with the problem, but if you're in a house without such things, it's really hard to watch television, and it's really hard to hold a conversation. Also, it's difficult to deal with other extraneous noises like air conditioning.

**FOHP:** So, what did you choose to help in Hart Hall?

**Bronsdon:**  The material we installed in Hart Hall is much less expensive than some you can buy...

**FOHP:**  … which we very much appreciate!

**Bronsdon:**  It works really well, and Disney uses it all the time. There's hardly ever an attraction made where that material, or something similar, won't be there. The thing that made the Hart Hall application even easier was that the ceiling was already dark, and the material you buy comes dark, so you don't have to change the look of the space appreciably, whereas another space with an ornate ceiling would have presented a real problem. So, the solution for Hart Hall was immediately obvious. At Disney, we also want that same dark material, because we don't want the guests to see it, so the solution for Hart Hall was very much like those used in the rides you ride at Disney theme parks. The only question was, how far do you take it?.. how much sound do you want to absorb? And the reason for just going with the ceiling was that, it provided a good balance the between natural character of the Hall, and having enough material to have good speech intelligibility. Hart Hall has so many windows that material on the walls would have looked bad, and not had the desired effect, because of the length of the hall. Similarly, Disney usually applies the absorption material to the ceilings, and sometimes the upper walls, just like in Hart Hall. We also don't want to cover up the things that people will want to see to the sides.

**FOHP:** Tell us about your role at Disney.

**Bronsdon:** My position was in the Audio-Video group, and I was the sole acoustics guy. The rest of the department is concerned with the electronics that deliver the sound and video, but only one acoustics guy needs to have listening expertise to be able to evaluate what will make the sound delivered by the other engineers sound good to the guests.

**FOHP:** What got you into this line of work?

**Bronsdon:**  When I was in college, I had a design course taught by an instructor from the Penn State acoustical department. At that time, Penn State was the only university in the country that had an acoustical department at all. The Navy had expertise, but Penn State was the only such college. Later during the Vietnam War, I joined the Navy and flew around in P-2s and P-3s using equipment to listen for submarines. After my service, I got a few civilian jobs contracting to the government doing the same thing, but those jobs dried up, so I called my old instructor. He convinced me to return to Penn State and get a masters in Mechanical Engineering with a focus on Acoustics. That got me a job with the premier acoustical consulting company in the world. That company, by the way, wrote the RFP for the packet-switching algorithm that made the Internet possible! I went on to work for several more acoustic and engineering firms.

**FOHP:**  How did you end up at Disney.

**Bronsdon:**  In about 1989, Disney was looking for someone to help with some serious sound problems they were having with Disneyland's Splash Mountain. They found someone to help, but after that, Disney decided they needed to hire someone full-time with these skills, and they contacted me. I thought they were hiring me for a temporary consulting job, but they seemed to think I was coming for a job interview. Afterwards, I got halfway home, in St. Louis, where I called my wife and said “That was interesting, I think it was a job interview”. She said “Oh yeah, they've called, and they want to know when you can start!” So, by March of 1990, we were in Los Angeles, having moved from Boston, and I was at Disney ever since, until my recent retirement. I was trying to count how many attractions I've worked on in the last 24 years, but it's been hundreds and hundreds.

**FOHP:** Fantastic! Well we're glad Hart Hall was one of your projects as well! What was your title at Disney, and in the industry in general?  
  
**Bronsdon:** At Disney, I was a Principal Acoustical Engineer, and in the industry I'm known as an Acoustician, and spell-checkers won't recognize that title by the way!

**FOHP:**  Well, we're proud to also call you a Friend of Hart Park! I want to thank for your time today, and for giving freely of your time back when you gave us the direction we needed to fix Hart Hall. We really appreciate the donation of your expertise, so we could make Hart Hall usable, which in turn helps with Hart Park, its museum, animals and events.

**Bronsdon:**  Glad to help! And we enjoy Hart Park too! We enjoyed being there an event at the Train Station with Joe Herrington [another Imagineer who gives of his time to Hart Park], and for Silents Under the Stars... so I think it's really good work that you guys do, and I was glad to help out!