

Worship the Lord

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Acoustical Improvement: Do You Hear What I Hear?

By Cary Grant

I can hear the reinforcement of my voice as I intone the words of the service, confess the Creed, and proclaim the Gospel from the pulpit. I can hear the final consonant sounds of the words which the choir has diligently practiced to make (like quickly repeating: the lips, the teeth, the tip of the tongue) during their rehearsals making those lyrics intelligible and understood by all in their praise of the Lord our God. I can hear the soft, whisper like, voices of Sunday school children as they proclaim the gospel promises of the birth of the incarnate Christ during their Christmas program. But I have to admit that is only true in the last few years here at St. John's.

St. John's Lutheran Church of Battle Creek was built in 1954. The frame structure had tile floors, a center aisle with pews that reached to the sidewalls, and a high pitched ceiling that made the mission style church of that era look almost like an A-frame. The ceiling was suspended with numerous "A" style wooden beams and trusses. The ceiling itself was populated with fibrous/porous decorative acoustical tiles, which of course would trap and deaden much of the sound made in the church. Of course, that seemed to some to be of no consequence to a young church and young pastors like Walt Beckman whose booming voice would command the attention and hearing of those sitting in her pews.

In the years to follow, the sanctuary and entryway would be carpeted, adding to the sound quieting properties of the church. And as the church membership began to "grey" during my call, fabric covered pew pads were added for the comfort of old bones and aching backs.

A few years after I had been installed as the pastor at St. John's, I began to wonder why the voices of the congregants and the various choirs or school aged children didn't seem to resonate with a brilliance similar to what I heard in surrounding sister churches. Like many pastors, I would surmise, I wondered if it was the selection of difficult pitched hymns or melodies or the choral pieces which were chosen for their message which made the difference. Yet, after weeding out a number of hymns that the congregation had difficulty in singing and selecting hymns

which were more palatable to their musical tastes and abilities, I found out that it didn't make that much of a difference. I also had hoped that when we decided to tape the services for our shut-in members or to record special services utilizing a new wireless microphone and audio system, including the installation of four small speakers suspended from the rafters in the back of the church, that it would help with the recognition of the spoken and sung words and their intonation. Again, it didn't seem to make that big of a difference to those sitting in the back of the church and those with age-related hearing problems. Furthermore with my diminished age-related hearing and too many high pitched whistles from officiating high school and college sporting events also taking its toll on my ability to discern a variety of pitches, I began to wonder if my increased stumbling over words when reading the scriptures might also be due to the lack of adequate auditory feedback at the church.

When I mentioned these things at our church council meetings over the course of the last ten or so years, it was met with some skepticism, especially when I suggested that we should consider replacing the acoustical tiled ceiling with a much harder surface to create more "bounce" of sound and a livelier setting for the sanctuary. Of course most the people had grown up in the church. They didn't seem to notice that words and music were at times muted, muffled, or muddied. They had grown accustomed to the church's acoustical weaknesses.

Interestingly enough, age had also begun to take its toll on the acoustical tile. The effect of 60-plus years of intense summer heat and heat rising to the top during the cold winter months was

Cary Grant, a 1979 graduate of Wisconsin Lutheran Seminary, was assigned to a new mission in Mt. Pleasant, MI and served there for almost 10 years. For the past 25 years he has been pastor at St. John, Battle Creek, MI—a church that seats 125 worshippers.

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becoming more and more evident as the tiles became dried out and brittle. The interlocking edges which held the tiles in place began to give way to the force of nature. They began to open up and just hang in place.

At first we tried to glue them back together or nail them back in place. But as much as we attempted to fix them, the more they began to fail. Eventually we realized that the tiles posed a potential health issue, with the possibility that one or more could fall and hit someone during worship.

So during the summer of 2013, after exploring several options, we contracted to have the ceiling covered with a half inch blue board—sheet rock which readily takes a plastered finish. We removed the pews from the sanctuary, storing them in a fifty-three foot semi-trailer during the project to make it easier for the contractors to carry out their work and less costly for us. Services were held in the parking lot, which also helped to create some interest in the neighborhood about St. John's.

As the ceiling project was nearing completion, I strolled through the sanctuary to look at the new ceiling and I heard something I had never heard at St. John's before—reverberation. After the ceiling was completed and since everything was still in a bit of disarray, we also decided to give the walls a fresh coat of a semi-gloss paint. This strengthened the reflective character of another surface and thus helped to improve the acoustics in the sanctuary.

The first Sunday back in the church you could tell the difference immediately. The reverberation and brilliance of sound was apparent to all. The voices of the members resounded off the ceiling and walls. Some people who wear hearing aids told me that my voice and the lyrics of the choir were no longer muddled. Because the final consonant sounds carried better in the room, they could better understand what they were hearing. One of our shut-ins told me after viewing a DVD of a service that the interior of the church seemed brighter (an unintended but positive consequence of a bright white plastered ceiling which now reflects more light) and that he particularly liked the new sound of the choir. I then revealed to him that on that Sunday it was a husband and wife duet that he heard and not our full choir.

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At our next Church Council meeting we discussed how much our new ceiling had improved the quality of the acoustics in the church. One council member confided that he had been skeptical about the new ceiling producing a marked improvement. But this skeptic was pleasantly surprised by the difference and stated that he wished we had done it years before.

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And finally, I don't seem to be stumbling nearly as much as I intone the words of the service, confess the Creed, and proclaim the Gospel from the pulpit. We can all clearly hear God's voice in word and sacrament as we gather together to sing his praise for the gift of our salvation.



Further reading

This issue doesn't suggest a common solution for every situation; it only provides impetus to explore possibilities. For further reading see *A Lament for Resounding Praise*, by Carl Schalk (posted on the Worship Web site). Some excerpts follow.

Schalk addresses common misconceptions about acoustical improvement. Worship is about corporate proclamation and praise, something we do together. One misconception is that concern for good acoustics is largely concern for something musicians want. Not so!

A bright, lively and reinforcing acoustical environment is important, therefore, primarily for the sake of the congregation.... The building itself is an instrument which must be designed so that the praise of God—whether spoken or sung, whether with voices or instruments—is a thing of beauty, lifting the spirits, bringing God's people together in a unified

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Hard surfaces support singing. High school honor choir, orchestra, and congregation at 2014 worship conference.

Top 10 acoustical mistakes

1. Carpet in church.
2. Peculiar geometry.
3. Poor choir and organ placement.
4. Carpet in church.
5. Mechanical system noise.
6. Thinking microphones and speakers can solve all acoustic problems.
7. Carpet in church.
8. Too low a ceiling.
9. Acoustic ceiling tiles.
10. Did I mention don't have carpet in church?

whole, encouraging and reinforcing their song, rather than draining its vocal energy as it attempts its praise and prayer.

A second misconception is the idea that live acoustics are possible only in large, cavernous interiors. Even the most cursory visits will reveal that some of the finest acoustical environments for congregational song are to be found in church buildings of modest size where care has been taken to ensure that hard, reflecting surfaces of walls, ceilings and floors predominate.

A third misconception mistakenly pits the spoken word against congregational song.... A worship space sufficiently reverberant for spirited singing can easily be made suitable for public speaking. But a worship space designed only with the speaking voice in mind has effectively been ruined for the music making of congregation, choir and organ.¹

See also a series of nine articles by Scott Riedel "Acoustics in the Worship Space" at www.riedelassociates.com.² Riedel's firm has provided consulting services to many WELS projects, including the chapels at Martin Luther College and Wisconsin Lutheran Seminary. From his years of experience working with churches, he offers the list at the left.

Additional thoughts

Pastor Grant's article illustrates the possibility of tackling more than one problem within one project: at Battle Creek both a poor acoustical setting and inadequate illumination. Other possibilities include expansion of seating area, chancel renovation or redesign, creation of a designated and functional space for musicians,³ installation of a new organ, reducing HVAC noise, and upgrading a sound system.

For any of these projects, consider that the value of a consultant is not first to implement a solution which a committee has already determined. The value is first to help committees to ask good

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questions and explore options that might not otherwise be apparent. After all, the topic of good acoustics is more than a little arcane. The science and objectivity behind good outcomes are well beyond the experience and competence of typical committee members.

A common question about hard surfaces is a concern that foot traffic will be distracting during communion distribution. Riedel has given many presentations in church basement fellowship halls, deliberately walking back and forth. When the question about foot traffic noise (eventually) is raised, he can ask if his walking back and forth has been an issue. Nope! Case closed.

Be careful with sound consultants who solve sound problems primarily with sound equipment (microphones, speakers, mixing boards). There is a place for such equipment and solutions—but ideally only after a room's natural acoustic is first optimized for unamplified sound. Then, explore subtle reinforcement of musical sources as needed.

Caution: many "sound system" guys don't like reverb! They like a room as dry as you can get it. Then they can "control" absolutely everything with mics and speakers. This view is simply incompatible with Lutheran worship that places a great emphasis on the sung word. Dry acoustics are the people's #1 participation killer. It's not rocket science, but there is a



scientific reason why people tend to sing in the shower and not in the family room! (from an email by Aaron Christie advising a church's renovation process)

Here's a fourth misconception, added to three that Schalk addresses above: good acoustics are more expensive than poor. Schalk recommends "the simple integrity of slate or tile instead of carpet." This might "sell" better to a building or décor committee if that committee studies maintenance costs and replacements costs. Somewhere around the time that carpet becomes frayed or faded, the long term benefits of hard surfaces win out from a cost perspective—even apart from all the other reasons to use hard surfaces.

Some people's preferences are matters of *visual appeal* rather than *functional assessment*. So study both issues. Identify hard surfaces that are beautiful; show examples. Note the trend in home design back to hardwood floors. If the nave is tiled, a beautiful hardwood floor in the chancel can serve both visual and acoustical goals. Discuss (perhaps in an open forum) the functional reasons for a vibrant and supportive acoustic.



2014 worship conference children's choir

For just one option among many, check out the stained concrete flooring at Our Savior Lutheran (LCMS), Houston, TX. Also Summerville, SC (WELS), about which Jon Hein states, "It's more

expensive than carpet, but substantially cheaper than tile (and, in my opinion, more elegant)"—not to mention easier to maintain and won't wear out and need replacing like carpet. Some recent WELS projects with stained concrete in Wisconsin are Hubertus, Franklin (St. Paul), and Jackson (Morning Star). Try Google Images for some of these. And not only churches, also an upscale grocery store in Brookfield, WI!

For new construction, involve a qualified acoustical consultant early in the process—not after the building committee has worked extensively with an architect and a basic design is already somewhat determined. In one case months of committee work and architect fees were scrapped when it became clear that the architect's unusual design ("peculiar geometry") would not provide a supportive acoustical environment. The cost in dollars, frustration, and good will could have been avoided by clarifying the roles of architect and acoustical consultant at the outset and then shaping an effective team process.

Acoustics for outreach?

Absolutely! It can only boost positive first time impressions when a guest's reaction (verbalized or not) is that the singing and music sound great; the presiding and preaching are delivered with absolute clarity. Schalk's article contrasts his experience visiting two churches. "In the first church the participation in worship and song was thrilling. The second church building was depressing indeed."



- ¹ *Christian Century*, March 23-30, 1983.
- ² While these articles originally appeared in a publication that focuses on pipe organs, the principles articulated are important for several aspects of worship: congregational singing as well as verbal participation, supportive acoustic for choirs (including children), beauty of tone from all instruments.
- ³ See the online version of *Worship the Lord* #26, September 2007, for five examples: two main floor, three balcony.

Photo credit: freshframephotography.pass.us/WELS-worship-conference-2014. Many other photos from the worship conference are available at this link.