Charles Fisk

The Architect as Organ Maker

reprinted with permission from Faith and Form

Journal of the Interfaith Forum on Religion, Art, and Architecture

AXIOM: PLACEMENT is the most important of the factors which determine the effectiveness of an organ. That is to say, the way in which the pipes of an organ are arranged among themselves and then situated within a building has largely to do with the way the organ will ultimately sound. Or as a physicist might say, "In both designing an organ and placing it in a building, the geometry must be given greater weight than any other factor."

It is not possible to prove the truth of this axiom here; indeed the truth of it emerges only out of long and-often bitter experience in which one has attempted to disregard it. Ask an organophile what makes a good organ and he will probably mention choice of stops, scaling and voicing of the pipes, acoustical reverberation period of the building, etc. etc. Or perhaps he will even mention placement (or geometry if he is a physicist), but he is not likely to put it at the top of the list as I have. Despite that, let us begin here by assuming that our Placement Axiom is in fact axiomatic, and then let us see what conditional conclusions can be deduced from it.

CONCLUSION I. The architect of the building has *primary control* over the organ builder's chances for providing a fine instrument. He sets an upper limit to the quality of the organ, as it were, for he provides the building and the site for the organ in the first place. Now it is common to hear church musicians inveigh against the architect of such and Such a building for making it "dead" acoustically, perhaps by permitting wall to wall carpet or by using acoustic (actually *an*acoustic) plaster or tile, so that reverberation time is cut to minimum. Indeed, this is a grievous crime, which architects and church committees too often commit against music's estate; yet by our Placement Axiom it is not as grievous as sinking the organ pipes in that lateral abyss known as the organ chamber (much as if they were part of the plumbing or heating), or putting them on random

display out in the open.

CONCLUSION II. From Conclusion I and the Placement Axiom, it follows that organs will be good only if architects make a serious attempt to understand what an organ really is and how it works. In a sense, *architects are actually organ builders*, and I hope they will not cringe when I say that they have been making a rather bad job of their organ building in the past century or so. I do not really mean to pretend here that the parlous state in which the church organ presently finds itself can be laid at the church architect's door-he after all has only provided in the long run what ministers, congregations, organists and organ builders have thought pleasing-but architects, by their disregard of what organs might be, i.e., by lack of imagination vis-a-vis the organ, have certainly helped the instrument's downfall. To put it more constructively, were architects suddenly to take an intelligent interest in the organ, there would unquestionably be a striking change in the usefulness and the quality of the instrument. The current rise of the electronic organ-substitute is partly the work of architects who in the first place helped the organ to take on the nature of musical air-conditioning equipment, and who, now that the chambers required for such equipment are so expensive, have turned to the electronic "organ" for space saving reasons.

CONCLUSION III. If architects are indeed organ builders, it then follows that they have always been organ builders, and that they are in part responsible for the way in which the organ has evolved. In other words, they are in part responsible for its original glory as well as its recent downfall. This statement requires an historical explanation:

The organ, to the Romans a secular instrument, found haven in the medieval monasteries and emerged from the middle ages as the church instrument. Why? I think it was primarily because of the type of building which medieval church architects provided. These were lofty buildings made largely of stone; acoustically they were very live--long reverberation time--which meant that any sound made within was sustained for several seconds by the building. (Hence the concept of the building itself as a musical instrument.) Percussive sounds, or sounds of short duration, fare poorly in such buildings. Sustained tones, however, such as the notes of an organ, are received sympathetically; the initial note is simply added to by the sustaining property of the building, and the effect after holding the note for two or three seconds is as if the tone were emanating from every corner of the room, which indeed it is. This effect, known in acoustics as diffusion, in which the listener is surrounded by his sound sources, is extremely pleasing to the ear and is aesthetically apposite to the visual effect of these

lofty buildings.

Since a reverberant building reinforces a weak sustained note in such a way as to make it seem pervasive, and since it reinforces only the harmonic content of a coarse sound, the early organs, whether feeble or coarse or both, produced a singularly happy result in the environment provided by the medieval church architect. Within this environment, during the three centuries from 1400 to 1700, organ culture grew in complexity and elegance until, by the early part of the 18th century, a pinnacle was reached. If we cannot exactly relate the decline of the instrument in the last two hundred years to the decline of reverberation--time in church buildings-it is more correct to relate both to other historical parameters--we can certainly remark that organs do sound uninspiring in dead churches, and goodness knows we have an adequacy of these at present.

I have just said that the organ grew up in live buildings and I have implied that in consequence a live building is almost essential to the tonal health of the organ enclosed within it. All true, but what has this to do with our Placement Axiom? To explain, I must continue our history:

The earliest and simplest music widely used in the medieval church building was plain chant, a purely melodic form of vocal music. Plain chant too could not have developed without the live building, for it is the overlaying of each new tone upon the reverberating "tail" of the tones just previously sung that makes plain chant effective. For pure melody, placement of the musicians would not have been critical; however, as soon as more complicated music of two separate contrapuntal parts was essayed, musicians must have realized that the *linear*, or *horizontal*, ideas they wished to express ended up in confusion unless they chose carefully the vantage point for their singing. Thus arose recognition of the importance of source-placement in the live building, for complex music requires that the listener be able to understand its "consonants" (transients) as well as its, "vowels," whether produced by voices or by musical instruments.

The simplest rule to remember is this: If a building is live, and, if you really want the listener to hear the consonants in music, or in speech for that matter, it is necessary to provide him with strong direct sound from the source so as to overcome the "vowel predominance" of the reverberating building. This implies first that you establish the entire source of sound in the building so that it is plainly *visible* to the listener ("line-of-sight transmission") since sound, like light, travels a straight path. Second, you can reinforce the direct sound by placing behind the source a close-fitting reflecting shell, like a band shell--indeed, the classical organ case was a

kind of wooden band shell. Sound which the source emits toward the shell is bounced back toward the listener almost immediately; thus, if the explosive consonant "t" is uttered, the "el' which the listener hears coming directly from the source is followed almost immediately by the "t" reflected off the shell, and for the listener the two sounds coalesce into a single consonant, the one sound reinforcing the other. Of course, if the shell is placed a large distance behind the source, then the reflected "e' is late in reaching the listener and he hears the two "t's" separately, the reflection then being heard as an *echo* of the direct sound, and therefore a hindrance to the listener's understanding.

A third measure taken for the sake of the consonants in music--and this is of particular concern to architects--is to place the source of sound where the walls and ceiling of the room, like the close fitting shell just mentioned, will give off *early* reflections which coalesce with the direct sound. The medieval organ was almost always placed with its back against a wall, which in addition to the wooden shell (case) provided early reflections for the intensification of the direct sound. A favorite site for the organ came to be the west gallery; this usually placed the organ as close as possible to both the ceiling and the walls of the tunnel-like clerestory, all of which gave off early reflections of each consonant emitted by the organ. In a long, reverberant building with a lofty west gallery organ it is sometimes astonishing to note the clarity with which the organ speaks, even when conversation between individuals randomly situated at floor level is impossible due to liveness. Clearly, the medieval architects who gave us vaulting clerestories-and galleries in stone also gave us, indirectly, plain chant and the motet, sung mass and the chorale, the prelude and fugue, for so much is the virtue of good architecture that it can be the cultural making of the people it serves. These timeless works of musical art, in their proper architectural setting, with-strict attention to the rules for good source placement, are breathtakingly beautiful even to our well-assaulted ears, and inspire many to attempt to recapture their sound for use in our modern churches. For a hundred reasons, many of them good, our churches differ greatly from the medieval, whence arises the question, how best to compromise and still retain some vestige of the original tonal effect? Heretofore, as I have implied, emphasis has been concentrated on the long reverberation time of the medieval church. The heart of many a musician has broken when, often simply for lack of height, new buildings have turned up with less than two seconds' reverberation, today regarded as the absolute minimum for church music, though meager compared to the four-to-eight seconds of the medieval church. Yet it is my experience that the medieval musician's solution to his own clarity problem in the live environment, namely good placement, can be of great help in the dead

environment. Thus we have a final conclusion:

CONCLUSION IV. By the Placement Axiom, we can have hope for reasonable success of a good organ in an acoustically undistinguished building, since there is nearly always the possibility of placing the organ well; indeed, poor placement results only when the building is conceived without paying any real attention to the needs of organ and choir.