

MISTAKES



JAMES WARNER

Yes, we all make them and no, they aren't all bad! It is through our mistakes that we learn. When asked how I obtained so much knowledge about our work, my standard reply is "through a huge number of *mistakes*." As I look back and marvel at the remarkable success of my former contracting firm, I recognize that our success was largely the result of the superb performance of our people and their willingness to risk a *mistake* to achieve great things. My admonition then, as now, is "Don't worry about mistakes as long as you learn from them—but **don't make the same mistake twice!**"

We had a quote from an obviously great person, whose name I don't remember (my *mistake* in not noting), posted in the shop:

"Success is the intelligent use of *mistakes*."

When I entered the concrete repair business in the early 1950s, there was no repair industry, no repair materials, and few resources for difficult access, shoring, and the like. Armed only with a fairly good knowledge of cement and concrete fundamentals, we went about many endeavors by trial and error (*mistakes*). When dealing with new materials or systems, we started with "laboratory" development, then into the yard with large-scale mock-ups using full-scale equipment, so as to simulate a real job as closely as possible. We made lots of trials, and nearly as many mistakes, but occasionally had a real breakthrough with far greater value than all the mistakes combined!

There is one instance that I still recall fondly. A neighbor to my rented yard was a two-man (father/son) machine shop. They were both brilliant mechanically. Long before the advent of the computer, they had figured out how to control large turret lathes automatically with a punched paper roll similar to that of a player piano. They were very helpful to my effort of building a grout pump (note there were no available concrete, mortar, or grout pumps in the early 1950s). One day the son approached me; one of his automatics (turret lathes) was vibrating excessively—couldn't we pump something under it to stop the vibration? Sure, but what? Resinous grouts were not yet available and all cementitious mixtures shrank.

And so our little firm's first material research program was launched: develop a pumpable cementitious grout that would be stable and completely free of shrinkage. Although still a novice, I did know many knowledgeable people in the concrete

industry, all of whom strongly advised against such an endeavor; you'll be wasting your time! I had similar advice while trying to build a pump that would pump mortar and yet successfully built one—why couldn't we figure out how to blend a nonshrink grout?

We had not yet progressed to a good headquarters. The office was a very old tiny trailer and the shop a rundown shack—both on a rented site; there was no lab, no lab equipment, and no one who knew what to do with such things even if we had them. Fortunately, we weren't like the smart people who knew what couldn't be done, so we forged ahead. Paper cups on the kitchen sink got the ball rolling—many, many, paper cups filled with concoctions that didn't work (*mistakes*). We couldn't stop now—the naysayers would laugh at us—so off to the market for some more paper cups! With time, we had a few mixtures that looked pretty good.

Now it was time to head outside for some realistic tests. Heavy steel boxes 4 x 4 ft (1.3 x 1.3 m) square—one 3 in. (76 mm) high, the other 12 in. (305 mm)—with slightly tapered sides and removable tops were made. Fittings were provided to inject at the bottom of one corner and fill until grout exited the opposite corner at the top. After a few rounds, the thinner box was abandoned but the 12 in. (305 mm) box was filled many, many times. And with each, the rented space became a little more congested with neat rows of our failures (*mistakes*) but, finally, some good ones joined the crowd! And although the adventure was expensive and even stressful at times, the good things that came our way as a result were enormous, including the first of several significant jobs for NASA in the early days of the space program.

There's no such thing as a *mistake* if you learn from it. Let us not make a big thing of our *mistakes*, or those of others, but rather seek and appreciate the knowledge that can result. Most importantly, don't make the same mistake again!

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