



LYLE'S LAWS

Lyle's Law of the Laboratory

TO THE DAY SHE DIED, my wife's Aunt Esther was a work in progress. Born a few years before the Great War (for our younger readers, that's WW I), she was a nurse, a wife and mother, a pillar of her church and community, and, in her middle years, a somewhat aggressive driver. She drove the two-lane Iowa highways as if she were always in a bit of a hurry, and she had no hesitation about pushing the speed limits just a little. As a matter of fact, it was insufficient hesitation that brought Aunt Esther a brush with the law.

Somewhere—I'm not sure just where—Esther failed to come to a "full and complete stop" at a stop sign. As one might expect, a minion of the law was nearby, observed the infraction, and hailed her before the court. The judge asked her to tell her account of the situation, and Aunt Esther (I can still hear her telling this story) said, "Well, Your Honor, I approached the stop sign, slowed down and looked both ways. Since I couldn't see any traffic coming, I decided to just mosey on through."

The judge deliberated very briefly and then passed judgment. "I see. Well, Ma'am, the next time you come to an intersection and see a sign that says, "MOSEY," you go ahead and mosey. But if it says "STOP," you stop. That will be 30 dollars and two points."

This little story is illustrative of Lyle's Law of the Laboratory. "See what is there, not what you wish for." There was a stop sign there, but Esther wished for a mosey sign, so that's what she saw. We can find ourselves doing the same thing in the laboratory.

There has been some discussion recently about the fundamental objectives of engineering instructional laboratories. I know of no such disagreement, however, about laboratories that are used for development or research. It has been said that we go to the laboratory to ask nature a question. Less poetically, we may say that we go to the laboratory to determine—by experiment—the behavior of the physical world—be it natural or man-made. But, oh, how easy it is to see what we want to see and not what is there.

I'm not talking here about those few greedy and unprincipled researchers who blatantly fake data in order to secure funding or enhance their reputations. They are clearly beneath contempt. Rather, I'm referring to those more complex situations where a certain amount of fuzziness and uncertainty exist and a reasonable person might see what he or she wishes to see. If you really wish for a result, be very skeptical if you get it.

One of my graduate students came to my office once to report on some favorable results that he had achieved in the thin-film lab. The device that he was developing had performed very nearly as he—and I—had predicted. I looked at his data and, sure enough, the plotted points were scattered close to a straight line with a slope that was close to our predictions.

"Nice," I said. "So how many times did you run this?"

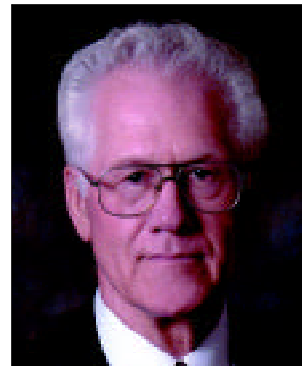
"Five times," was the reply.

"With the same result every time?"

"Well, no. Only the last time."

So we had a little chat about skepticism in the laboratory and seeing only what you wish to see, and he went back to repeat the experiment. Naturally, his good results were not verified.

Was he faking data? I don't think so. He just wanted so much to see those results, that he saw them.



If you really wish for a result, be very skeptical if you get it.

Both engineering laboratories and science laboratories are susceptible to this kind of "wishful seeing," but I think that we need to be especially vigilant with those devoted to the engineering-development process. Invalid results from a science-research laboratory certainly cause a lot of mischief—including significant financial loss—as people try unsuccessfully to repeat the published results or pursue unfruitful research paths suggested by the bogus data. In an engineering-research laboratory, bad data can lead to wasted effort and funds as the results are used to start development of a product that is never going to work. It is in the engineering-development process, however, where the greatest potential for problems occurs.

For one thing, in the developmental process we are usually in the laboratory to demonstrate that the product under development meets or exceeds a set of

pre-determined specifications. Under those circumstances, what we “wish to see” is well defined. That can make it easier to see than if we are just wishing for something vaguely defined as “good.”

More importantly, however, unjustified results in the development laboratory can result in a product that cannot do what it is expected to do. That can be serious. People can be injured. Fortunes can be lost. People can die. If there is ever a place for skepticism in the laboratory, this is it.

As usual, a good law has a general applicability outside its narrow sphere of definition. Certainly that is true of the *Law of the Laboratory*. I don't think I know anyone whose life is so perfect that he or she does not sometimes wish to see something that is not there. It may be something as simple as a mosey sign. Or as complicated as the character of another person—someone we wish to trust or even to love and spend the rest of our lives with. In both cases, it is far better to see what is there and not what we wish.

And of course there is the matter of looking at ourselves. In “To A Louse,” the great Scottish poet Robert Burns wrote,

*“O wad some Pow’r the giftie gie us
To see oursel’s as others see us
It wad frae monie a blunder free us
An’ foolish notion”*

Indeed what a “giftie” that would be—assuming, of course, the objectivity of those others who are seeing us. In any event, it is useful to take the viewpoint of another person while trying to achieve our own objectivity as we examine ourselves, our behavior, and our motives. And seeing, we hope, what is there instead of what we wish for.

I am not very good at computer graphics, but if I were, I would draw a stop sign with “STOP” replaced by “MOSEY” and then place across it a diagonal line, the universal sign for “don't.” A copy of that on my desk would be a good reminder of Aunt Esther and her brush with the law, and also of my need to always remember to see what is there and not what I wish to see.

See you next issue.

—Lyle D. Feisel, *Iowa Alpha '61*, Ph.D., P.E.