



LYLE'S LAWS

Lyle's Law of Decisions

When I (finally) received my Ph.D., I went to work for the South Dakota School of Mines and Technology as an assistant professor. Those were the days of growing research emphasis on American campuses, but at the Mines there was still a feeling of loyalty to the institution and camaraderie among the members of the faculty. One manifestation of this climate was the faculty lounge, a basement room where most of the faculty enjoyed lunch and/or coffee breaks. It was an atmosphere of liberal culture where we met with colleagues from other disciplines and discussed everything from antelope hunting to the state of the economy and certainly politics. One person who was always in the thick of the discussion was a history professor who also directed the chorus. He had a reputation as a wit (I told him I thought people were only half right) and could always be counted on for a clever comment. One day, in mock seriousness, he said, "I wish I could be a (here the reader may insert either major political party). Since I'm a (insert other party) I have all these questions and have to think about things and make up my own mind instead of having the truth all spelled out for me."

I have not specified which party goes in which slot because I don't want half of my readers to stop reading at this point and start writing their letters to the editor. I have known people of either stripe—or no stripe at all—who fail to do their own analysis or thinking but just accept the party line. This is what I caution against in Lyle's Law of Decisions: Make up your own mind.

When I left the School of Mines, I served for some years in a university whose roots are sunk deep in the loamy soil of the liberal arts. There, I heard a lot about the value of critical thinking and about the regrettable lack of it in our students and in our curricula. Critical thinking, we are told, is probably the principal educational goal of a liberal arts education. So, just what is critical thinking? Well, like so many terms of this nature, it depends on whom you ask; but there are some common threads in the answers you receive. That said, I will add a few words to the many that have been written on the subject.

First, it should be noted that while the word "critical" is often taken to have negative connotations, that is not at all the essence of critical thinking. The result of critical thinking can, of course, be a negative evaluation, but it can just as often be positive. Simply put—I hope not

too simply—critical thinking is the process of making up your own mind in an orderly, objective, independent, honest, and defensible way. Thus, the core of the Law of Decisions is the admonition to develop and employ your critical thinking skills.

For engineers, critical thinking is essential. Whether designing or improving a product, installing or operating a system, solving an operational problem, or, for that matter, managing a department or a corporation, engineers must use their heads—effectively. Besides their knowledge of basic subject matter, what engineers offer to employers and to society is disciplined brain-

power. That brainpower is most effective if it is used critically and, especially, independently. That is, if engineers make up their own minds.

One of the barriers to effective application of the Law of Decisions is the existence of "authority." It is difficult to make up one's own mind when there is someone who is demonstrably well versed on the matter at hand and is able and willing to act as an authority in any discussion. When that person says (or implies), "I'm the expert here, and this is the way we should do it," it is not easy to insist that you need a better understanding of the issue before you can sign off on the decision. But you must. You may need to say (with more diplomatic words, of course), "Look, if you're so smart, you should be able to explain to me the principles about which you are an expert." If they do, then you can make up your own mind.

There is a qualifier here, however. Engineering problems are so complex that it is not usually possible for everyone involved in a project to have a complete understanding of all of its aspects. You have to work as a team and rely on the expertise and the integrity of your fellow engineers. Then, it becomes a matter of applying critical thinking to the decision of how far to go in accepting the judgments that are offered. Again, it is not easy to assess

*A wise man makes
his own decisions;
an ignorant man
follows public
opinion.*

—Chinese proverb

the reliability of the resident authorities, but it's part of an engineer's job.

The Law of Decisions is broadly applicable, and I wish it were being applied more generally in the current political climate. It seems at times that the political advantage goes to those who can shout the loudest, not those who can provide a logical, critical analysis of the situation. In governing as in engineering, the best approach is, "Let's think this through." And make up your own mind.



While many whose academic roots are in the liberal arts lament the sad state of critical thinking in our society, perhaps it is engineers who are emerging as the critical thinkers. Indeed, if one examines the criteria by which ABET evaluates engi-

neering programs, one finds that programs must demonstrate that their graduates have (slightly edited):

- an ability to analyze and interpret data;
- an ability to identify, formulate, and solve problems;
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- an understanding of ethical responsibility;
- an ability to communicate effectively; and
- a knowledge of contemporary issues.

Sounds to me like a pretty good definition of critical thinking. Perhaps ABET would do well to specifically mention critical thinking in the criteria.

In the end, the important thing is to make up your own mind and to do so objectively, reaching a conclusion through evidence and logic and not because you would like or not like certain conclusions.

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

Special Gifts

Special gifts during the annual giving campaign were received in memory of Shawn R. Schwaller, SD A '95, from Marvin E. Criswell, NE A '65, Curtis D. Gomulinski, MI E '01, and Matthew W. Liberatore, IL Z '99; and from Mrs. William E. Moore II in memory of her husband, William E. Moore II, WV B '50. Special gifts were received in memory of Ferdinand E. Klein, PA I '50, from John R. Bienkowski, Mr. & Mrs. Roy Cleeland III, Valerie A. Heerwagen, Christopher Klein, Dolores Lawrence, and Mr. & Mrs. Richard D. Schmalz.

125TH ANNIVERSARY CLUB

2010 celebrates the 125th anniversary of the founding of Tau Beta Pi. To commemorate this historic occasion, a one-time recognition club has been established for donors



contributing \$125 or more in 2010. (Members of existing clubs will still be listed in those clubs.) Donors of \$125 or more will receive a striking memento acknowledging their special support during the Quasiquintennial celebration. This limited-edition item features the Association's

125th anniversary logo etched onto a polished 3" by 3" black marble paperweight. For more information, contact Patricia McDaniel—pat@tbp.org, 865/546-4578.

All 2010 contributors of \$125 or more will receive a 125th Club paperweight as pictured above.

LANGE TO ADDRESS ALUMNI IN NAPLES

Harry W. Lange, Michigan Zeta '75, will offer his views on the economy and the stock market at a reception for TBPI alumni on April 8 at the Vineyards Country Club in Naples,



FL. A vice president and portfolio manager for Fidelity Investments, the largest mutual fund company in the U.S., he manages Fidelity Magellan Fund and co-manages Fidelity Advisor Global Equity Fund. He has served as a member of TBPI's Trust Advisory Committee since 2007.

In his position, Mr. Lange travels extensively to speak to various groups throughout the country. He has graciously offered his expertise at what we plan to be the first of several talks at TBPI events.

The reception will begin at 5:30 p.m. with hors d'oeuvres, followed by Mr. Lange's talk and a brief update from TBPI **President Larry A. Simonson**. If you wish to attend, contact Patricia McDaniel—pat@tbp.org, 865/546-4578—by April 1.