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THE FIRST WORD

HISTORIES MAKE MEN WISE*

Real wisdom grows out of the sympathetic study of folly. This is not a stunningly new idea. Cato the Elder said, "Wise men profit more from fools than fools from wise men; for the wise men shun the mistakes of fools, but fools do not imitate the successes of wise men." He might have added that wise men may also shun the mistakes of other wise men. As Victor Serebriakoff, a president of Mensa, once remarked, "Being a genius is no insurance against being stupid."

What Went Wrong? Case Histories of Process Plant Disasters by Trevor A. Kletz (1985, Gulf Publishing Co., Houston) is a 200-page chronicle of stupid mistakes—folly in process concept, plant design, and day-to-day operation. In the context of *What Went Wrong*, the disaster at Bhopal is just an extreme example of the bone-headedness-as-usual that afflicts plants everywhere in the world—with unauthorized design changes, faulty maintenance, and human errors compounded to make an intrinsically hazardous process fatal.

The objective, well served, is to teach the principles of caution and good practice by examining recklessness and error. Most dangerous, he says, is not that those making plant modifications don't know the proper procedure, but that they "do not know that they do not know." And, "What you don't have can't leak" should be blazoned as the motto of process designers everywhere.

At one plant, for example, fitters used welding gases to inflate truck tires. At another, workers tried to shrink-fit a bearing on a shaft in a pit...by heating one end with an acetylene torch and cooling the other with a stream of liquified natural gas. One man was killed and two injured. The book runneth over with leaks, fires, falls, suffocations, and explosions. All avoidable.

Now, one might argue that such heavy-industry examples have nothing to do with the smaller-scale, higher-tech biotechnology plant. Yet in addition to the dangers of live steam, flammable hydrocarbons, strong acids and bases, and perhaps chemicals as toxic as phenol, biotech plants can deal with potent antibiotics and live pathogens.

Even on the laboratory level, of course, accidents do happen. Sometimes the effects are positive: afterwards those involved nod sagely, say "Chance favors the prepared mind," and write up the results as though they had intended to do the experiment that way all along. (One herbicide was discovered by a technician who accidentally knocked a container of the stuff into a potted plant, which obligingly died.)

So far, though, the main reported consequences of miscalculation and clumsiness have been economic.

A small gene boutique offered a large manufacturer the gene sequence for an important mammalian protein. The drug-maker's staff ran the sequence through a sophisticated computerized data base, and discovered that what they actually had was a mitochondrial DNA gene. At the boutique's asking price, "the computer system paid for itself in a single afternoon," says the man who put the system together. The gene boutique, however, is supposedly close to receivership.

The same pharmaceutical company was offered another supposedly significant sequence—a protein this time. The data-base search revealed that the outside lab had succeeded in sequencing the antibodies used to affinity-separate the material. Again, no sale, and months of work quite literally down the drain.

Such cautionary tales do little good if no-one hears them. And those involved, thinking of their reputations and possible lawsuits, are understandably reluctant to associate themselves with the story. So we ask our readers to send us examples of mistakes they have made or heard of...and for ideas on how to fix or avoid these errors. We will denature the details to protect the guilty, while trying to retain the central moral. For only by learning from such histories can we avoid repeating them.

As is not engraved on the Statue of Liberty, "Give me your bungled, your botched, your muddled mishaps yearning to breathe free."

—Douglas McCormick

*Francis Bacon, *Essays*, "On Studies."