"Safety Evaluation"
or
Risk Assessment at FDA

A Long, Rich History

What do these words, concepts mean, and do they age well?

It is difficult to get a man to understand something when his salary depends upon his not understanding it.

Upton Sinclair

Personal bias is difficult to surmount

The Beginnings:
HARVEY WILEY'S POISON SQUAD
Theatre masquerading as Risk Assessment

Poison Squad 1902-1903

- "Wiley stopped the experiments only when the chemicals made several of the diners so sick that they couldn't function--nausea, vomiting, stomachaches, and the inability to perform work of any kind. By this time, though, stories of the men's indigestion had run rampant and were being followed by fascinated readers all over the United States. The table trials even made the minstrel shows. In the end, the publicity helped Wiley gain a Congressional hearing, as well as support for his contention {moral bias} that chemical preservatives had no place in food." Wiley needed to be a crusader before being a scientist. Not uncommon.

- These boys were going to get sick. Wiley designed the "table trials" to confirm his bias, which looks a lot more like theatre than science/objective assessment of risk.

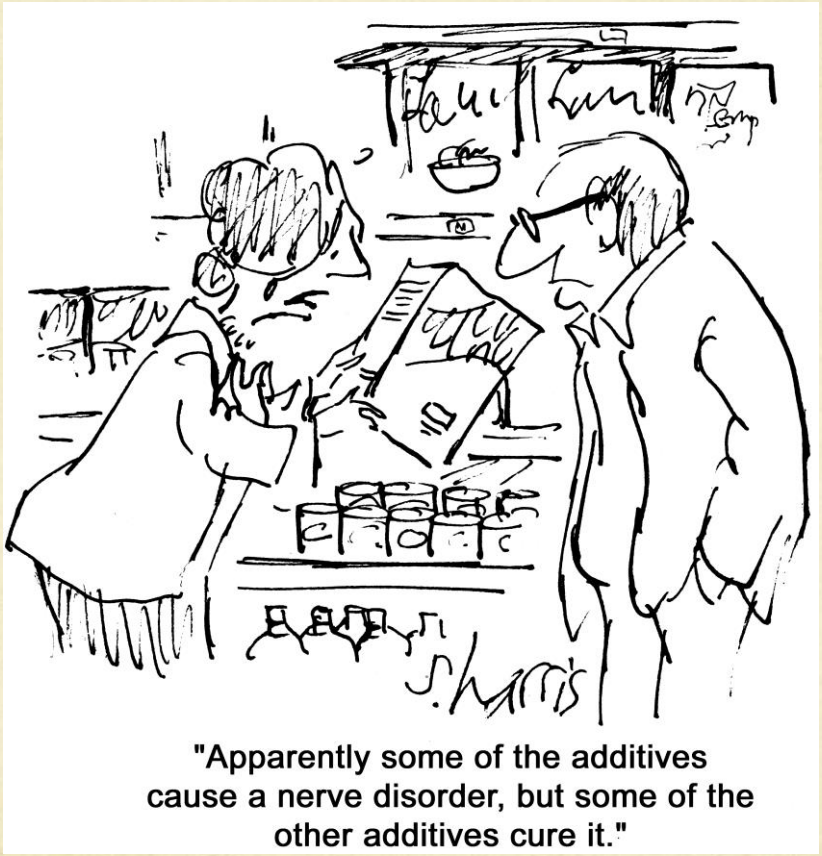
The Performance of Safety/Risk Assessment is Always Predicated upon a Moral Premise

- Today, science drives the risk assessment methodology. However, it is the public and their elected representatives in Congress that define the moral premise. Moral premises are not a special purview of science. Wiley assumed that they were, and was wrong. It was not really his presumption to make in the first place.
- Risk assessment is not performed in a void for fun, or to earn salaries. It is imperative to always remember the integral moral purpose: safety.
- Forgetting the implicit purpose behind risk assessment is the lapse that propels risk assessment technique into theatre, that is, risk assessment that is biased by the convictions of the risk assessor.
- There are two generic forms of risk assessment.

I. Qual(itative) Risk Assessment

- Employed especially from 1906 to 1958 (though often still used today).
- It is consignment to either of two categories. All, or nothing, like an on-off switch . Something is either/or, toxic or not-toxic, guilty or innocent. One dimensional.
- Operative legal terms from the 1938 FD&C Act, summon simple notions of certainty: poisonous, deleterious, adulterated, filth, putrid (and present, not absent).
- The paradigm is about classification.

But, Reality is not One-Dimensional; Neither is Risk/Safety



"Apparently some of the additives cause a nerve disorder, but some of the other additives cure it."

II. Quantitative Risk Assessment

- Invented by FDA scientists in the 1940s-1950s. Coined 'safety assessment' or the 'safety paradigm.' Implemented in the FFAs of 1958. The integration was far ahead of its time.
- A quantum leap: multidimensional, dose-response metric, laboratory animal driven. Safety/Risk is all about dose, not much at all about occurrence, which is Qualitative. Quick International buy-in.
- QRA for carcinogens sprung later (1970s) from the same fabric; it gave rise to the familiar 'risk assessment' idiom.

So, What's Up Now?

- 1. QRA has not changed conceptually since the 1950s;
  2. the public/press still emotes over detection not risk;
  3. public perception of risk is confused, wary, if not cynical;
  4. detection has catapulted from ppm to ppt: 10+6 fold;
  5. too many extant toxins, too little time, too little bullion;
  6. faster, cheaper, better? Ah, better, or good enough, is the rub.

- After 50+ years, it is past time for another 'quantum leap' of understanding. But, fulfilling the purpose of "safety" is imperative, not just taking care of issues1-6.

Good Luck!