WELCOME

To the 13th conference hosted by the International Dose Response Society

At UMASS Amherst

Preconditioning and Adaptive response

Some Evolutionary History

- Progress occurs through adaptation
- Requires a combination of flexibility and sustainability
  - Flexibility to be able to change when required
  - Sustainability to be able to retain beneficial characteristics in the population
- Requires living “on the edge of chaos” where there is enough instability to enable the population to capture advantageous changes

Logic

- We all know instinctively that Paracelsus was right when he said "Die Dosis macht das Gift."

That is to say, substances considered toxic are harmless and often beneficial in small doses, and conversely an ordinarily substance such as a transition metal can be deadly if over-consumed.

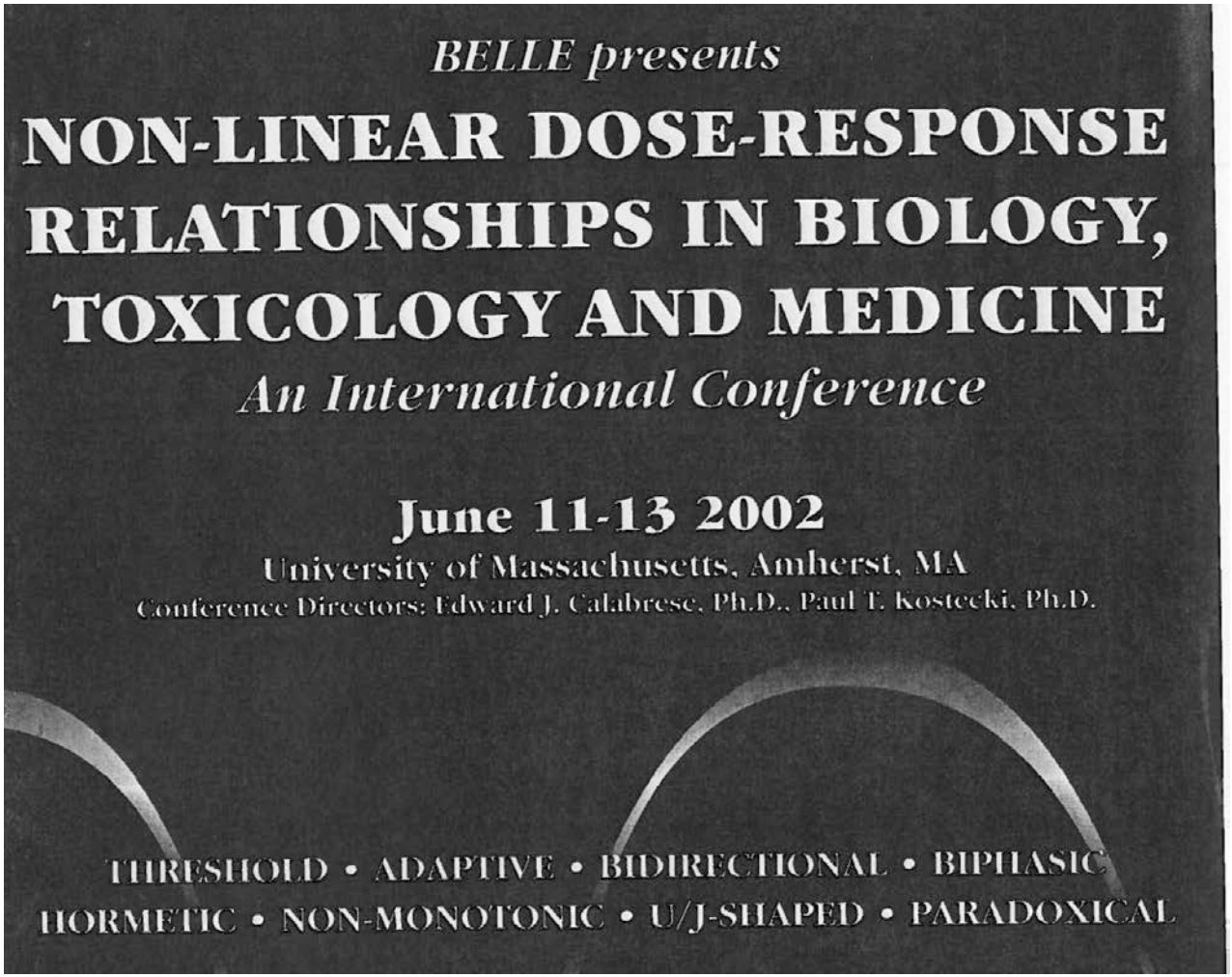
So why is this concept so hard to accept in science? Why do we cling to the concept of linear dose response? Why are adaptive responses ignored in environmental and radiation protection and in medicine?

Ask Ed our gracious host who has researched these questions from a historical, political and scientific perspective and has worked tirelessly through these conferences and other means to keep this field alive

The evolution of this conference

- 2002 – all about non-linear responses in biology and medicine
- 2005 – the word “hormesis” appears in the conference title and the conference focuses on low doses
- 2008 – Until 2013 the conference focused on low dose mechanisms and sought to establish protective low dose effects as “real”
- 2014 – New focus on one aspect of hormesis – i.e. preconditioning exposures leading to adaptive responses

Title page of the first conference



Plenary from 1st Conference

PLENARY
Moderator: Paul T. Kostecki, *University of Massachusetts, Amherst, MA*

8:50am **Biphasic Dose Responses in the Biological Sciences**
Edward J. Calabrese, *University of Massachusetts, Amherst, MA*

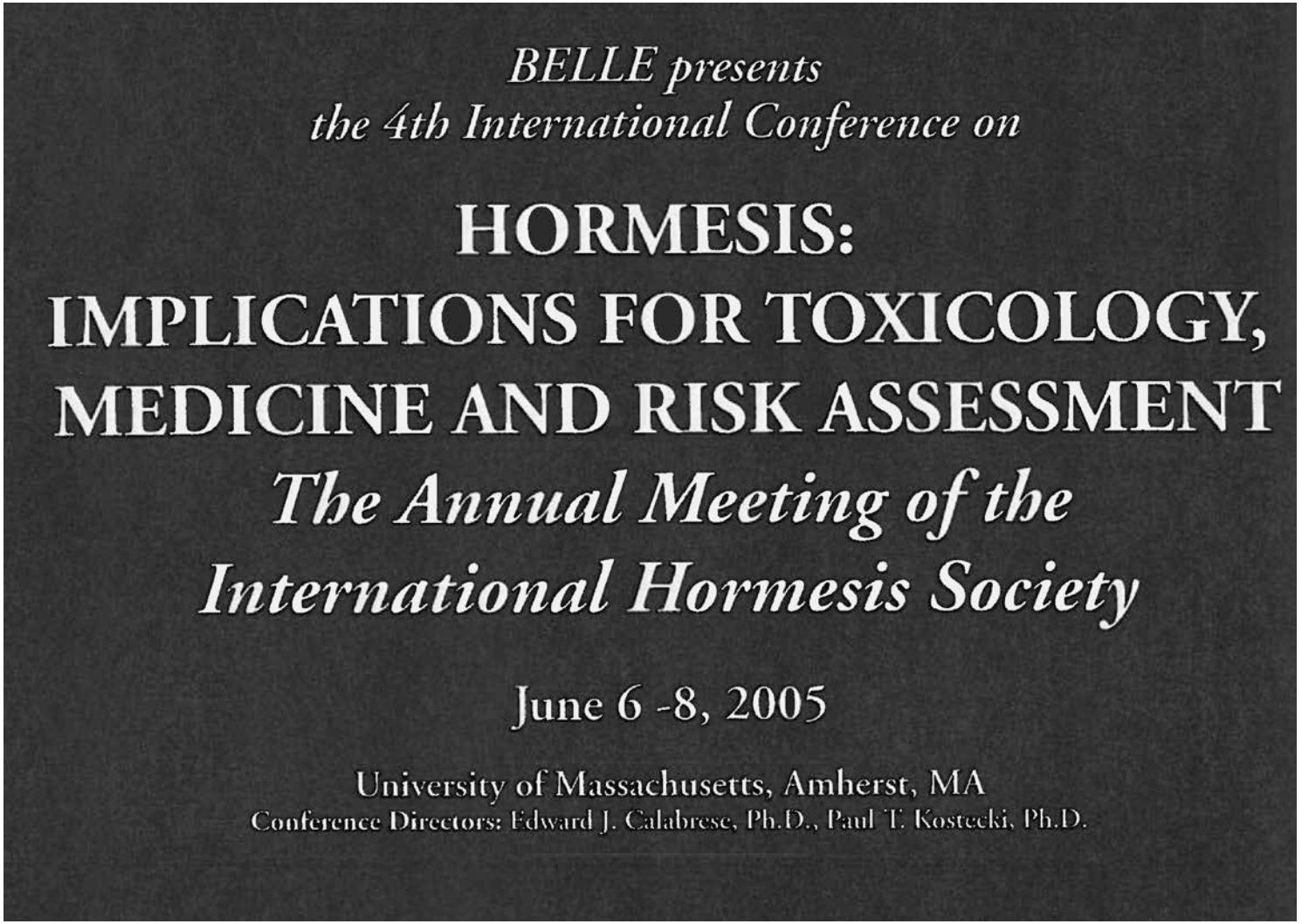
9:30am **Implications of Non-Linearity for Ecotoxicological Risk Assessment**
Keith Solomon, *University of Guelph, Guelph, Ontario, Canada*

10:10am **Break**

10:40am **Evolutionary Foundations of Non-Linearity**
Lorenz Rhomberg, *Gradient Corporation, Cambridge, MA*

11:20am **Risk Assessment Implications of Non-Linear Dose-Responses**
William F. Greenlee, *Chemical Industry Institute of Toxicology, Research Triangle Park, NC*; Frederick J. Miller, *CIIT Centers for Health Research, Research Triangle Park, NC*; Rory B. Conolly, *Center for Computational Biology & Extrapolation Modeling, Research Triangle Park, NC*

2005 conference actually called the Hormesis conference



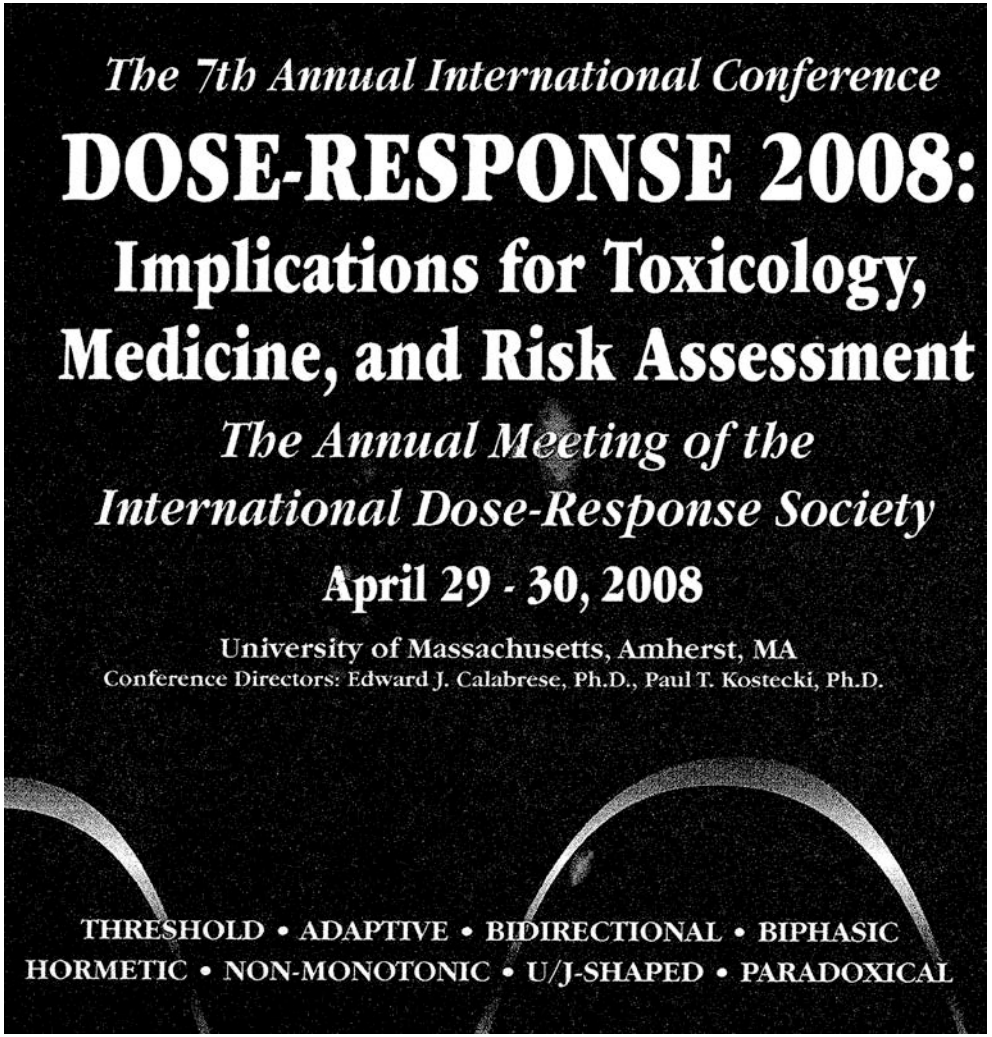
Plenary from the first "hormesis" conference

Session I: PLENARY

Moderator: Edward Calabrese, *University of Massachusetts, Amherst, MA*

8:30am	**Hormesis in Precautionary Regulatory Culture: Models Preferences and the Advancement of Science** Jaap C. Hanekamp, *CEO HAN, Zoetermeer, The Netherlands*
9:15am	**Stochastic Thresholds: A Novel Explanation for Nonlinear Dose Response** Bobby Scott, *Lovelace Respiratory Research Institute, Albuquerque, NM*
10:00am	**Break** *163C Campus Center*
10:30am	**The Risk Communication Challenge of Hormesis** David Ropeik, *Harvard University, Boston, MA*
11:15am	**The Emergence of Hormesis in Biology, Toxicology, and Medicine** Edward Calabrese, *University of Massachusetts, Amherst, MA*

2008-2013 firmly dealing with dose response



2014 new look: Adaptive Responses