# GUEST EDITORIAL: The role of truth in science

Science is not about Truth (certainly not with a capital T); it's about usefulness. Rules such as Ockham's razor (or Occam if you prefer the misspelling) guarantee that we aren't seeking the true answer, but instead the easiest way to get to a useful answer. Combined with the scientific method for predictive power, testability, and repeatability, this means what we are constructing is the world's most powerful tool. It is a model of the world that allows us to make predictions about what will happen - a model which allows us to get on an airplane confident that it can fly, build computers with reasonable certainty they will work, and much more. The model may not be "true" in the literal sense, but it is the simplest way to get the best known prediction.

As such, of course there is no scientific truth, there is only an accuracy of prediction. The laws of thermodynamics have been tested long enough to give you 999 or more 9's in their accuracy (99.9999...*etc*...%, never 100%), because there's always tomorrow. That's enough certainty for me to even bet my life against a single penny. Other theories range all the way to complete inaccuracy in their predictive power (perpetual motion, anyone?).

Tying it back to the global warming discussion, we should always make decisions based on the best known data. However, we need to understand:

1. What is the certainty of the prediction? Specifically, how likely is it that some action on our part (cutting emissions) would create the desired effect (reducing the chance of some sort of catastrophic global warming)?
2. What is the cost of doing something?
3. What is the cost of doing nothing?

Proper policy balances the three. The debate I would summarize so far doesn't address that balance. What I hear so far seems to focus on this idea that we have enough scientific certainty that we should do this at any cost (which is never true) on one side, and on the other that we have not reached some threshold of certainty and therefore that we should do nothing. Instead, what we need is a good plan -- one that takes into account the costs of acting. Then we can have a graduating scale of: at low likelihoods, do step 1. As the certainty increases, do step 2, *etc*. Each one balances the cost of what we do against the cost of doing nothing and the certainty.

I realize that it is hard in the case of global warming because controlled experimentation is impossible, but without an ability to put a number on that certainty -- which is the crux of the debate -- we aren't going to get anywhere arguing over whether we are "certain enough". Without being able to put a cost on the actions we could take, we aren't going to get anywhere arguing that we should act. Once we have a plan like that, promoting it becomes much easier. We can fight over whether we are at step 5 or 8, but can stop fighting over whether we've reached some magical "scientific certainty" threshold for acting.

-- Kevin Laws

(*Editor's Note*: Like an earlier piece by Kevin Laws in our Spring 2004 issue, this guest editorial is taken from one of his postings to the listserv of the Physics and Society Group of the American Association of Physics Teachers. The son of physicists Kenneth and Priscilla Laws of Dickinson College, Kevin is the listserv's "resident economist": he teachers MBA students at San Francisco State University and is an investor at a Silicon Valley venture capital fund.)