

Hazy reasoning behind clean air

Science alone can't determine how regulations are written, argues **David Goldston**.

Last month, *The Washington Post* reported that President George W. Bush had personally intervened to weaken new regulations to control smog just as they were about to be announced by the Environmental Protection Agency (EPA). In response, advocates of tighter standards predictably charged that the president had overturned a scientific judgement. Carol Browner, who headed the EPA under President Bill Clinton, put the matter starkly, telling the *Post* that the Clean Air Act creates "a moral and ethical commitment that we're going to let the science tell us what to do".

But does it? This conceit that science alone should and can dictate clean-air standards is propagated by political figures of all stripes and often by scientists themselves. Politicians always want to argue that any regulatory meas-

ure they are supporting is based on science because it sounds objective and fair. That's especially true in a polarized environment, when your side may be the only one that can reach some ideological persuasion.

In reality, though, policy judgments are often made in the face of scientific uncertainty. The Clean Air Act's "judicial" decisions to the "judicial" of the EPA (a pre-emptive move, as advised by the Supreme Court) that stand science conflates policy and science needlessly in the line.

So what's really at stake? The rule sets what is known as the maximum allowable concentration of ozone, the main component of smog, to "protect the public health, not taking into account any other than the primary effects of ozone on the public health."

The EPA's 24-month review of the standard should weigh in on two criteria: whether the secondary standards should be more stringent and whether the primary standards should be more stringent.



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areas turn out to violate the standard because ozone levels can vary significantly within a given day. For example, if being above the allowable

unanimously recommended a specific range of ozone standards, a number within that range can hardly be seen as the only justifiable standard under the law. Indeed, the EPA's own science staff had recommended a slightly different range. Critics are free to attack the number chosen by the president, which will keep some rural counties in compliance with clean-air rules. What they cannot legitimately argue is that the president's selection runs counter to the science. The debate is about what kinds of damage harm the public welfare and what kinds of uncertainty can be tolerated as a basis for decision-making.

The debate over the new ozone standards is just beginning, but the detrimental impact of confusing science with policy can be seen by looking back at what happened in 1997, when the EPA last changed the ozone rules. The fight then was over the primary ozone standard, the one designed to protect public health. The EPA proposed tightening the standard, and Browner (then EPA's chief) repeatedly argued that the decision was dictated by the science.

As a congressional staffer, I fought for the EPA proposal and I still support it. But what the science told us was that for a given predictable number of days in a year, there was little evidence of chronic health effects. The policy issue was not whether the standard was too strict or too lenient, but whether it was a "policy call", not a scientific one.

Most of the time, the debate is about what became a predictable number of days in a year. The science told us that for a given predictable number of days in a year, there was little evidence of chronic health effects. The policy issue was not whether the standard was too strict or too lenient, but whether it was a "policy call", not a scientific one.

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Hazy reasoning behind clean air
David Goldston,
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'Science alone can't determine how regulations are written'

[...] EPA's science panel found that "quantitative evidence [...] must [...] be characterized as having high uncertainties." What to do in the face of uncertainty is a policy question, not a scientific question. [...] The debate is about [...] what kinds of uncertainty can be tolerated as a basis for decision-making.



Eisenhower's Farewell Address to the Nation January 17, 1961

<http://www.informationclearinghouse.info/article5407.htm>

Today, the solitary inventor, tinkering in his shop, has been overshadowed by task forces of scientists in laboratories and testing fields. In the same fashion, the free university, historically the fountainhead of free ideas and scientific discovery, has experienced a revolution in the conduct of research. Partly because of the huge costs involved, a government contract becomes virtually a substitute for intellectual curiosity. For every old blackboard there are now hundreds of new electronic computers.

The prospect of domination of the nation's scholars by Federal employment, project allocations, and the power of money is ever present – and is gravely to be regarded. **Yet, in holding scientific research and discovery in respect, as we should, we must also be alert to the equal and opposite danger that public policy could itself become the captive of a scientific-technological elite.**

RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT
Rio de Janeiro, 3-14 June 1992

Principle 15

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, **lack of full scientific certainty shall not be used** as a reason for postponing **cost-effective** measures to prevent environmental degradation.

The Scientist Qua Scientist Makes Value Judgments

Richard Rudner

Philosophy of Science, Vol. 20, No. 1 (Jan., 1953), pp. 1-6

...clearly the scientist as scientist does make value judgments. For, since no scientific hypothesis is ever completely verified, in accepting a hypothesis the scientist must make the decision that the evidence is sufficiently strong or that the probability is sufficiently high to warrant the acceptance of the hypothesis. Obviously our decision regarding the evidence and respecting how strong is "strong enough", is going to be a function of the importance, in the typically ethical sense, of making a mistake in accepting or rejecting the hypothesis.

Weinberg A M. Science and trans-science. *Minerva* 10:209-22, 1972.
[Oak Ridge National Laboratory, TN]

Origins of Science and Trans-Science

Alvin M. Weinberg
Medical Sciences Division
Oak Ridge Associated Universities
Oak Ridge, TN 37831-0117

becoming involved in the debate over nuclear power—in particular the debate over the hazard of low levels of radiation.

After the paper was published, Harvey Brooks added another dimension to “trans-science”—the evolution in time of systems governed by large classes of nonlinear equations.

4. Wagner W G. Trans-science and torts. *Tate Law J.* 9:428-49, 1986.

such as... Brooks suggested that an analysis of such situations was beyond the power of mathematics, and therefore, was trans-scientific.²

The term “trans-science” is used quite widely now. Perhaps most notable was W. Ruckelhaus’s admission in 1985 that many of the EPA’s regulations hang on the answers to questions that can be asked of science but cannot be answered by science—i.e., are trans-scientific.³

is gradually being recognized in many quarters. For example, W.C. Wagner concludes: “...in order to accommodate trans-science, the judicial framework must change... Trans-scientific obstacles can be circumvented by referring to more predictable notions of qualitative causation and unreasonable conduct—thus the courts may be able to reincorporate the principle of deterrence into the adjudication of toxic torts.”⁴

In addition to giving a name to an idea that regulators and toxic torts lawyers had been grappling with, “science and trans-science” has added another dimension to the perennial quest for limits to science. To the limits of science posed by Heisenberg’s uncertainty principle, or the second law of thermodynamics, or the limits of science.

Proceedings of the Symposium on Phenotypic

ssment, December 7-10, 1986. Brookhaven National Laboratory.

Minerva 10:484-6, 1972.

Technol. 1:19-38, 1985.