Letters

Two Plus Two

If Daniel E. Koshland, Jr.'s editorial "Two plus two equals five" (23 Mar., p. 1381) reflects how the scientific community views its critics, it goes a long way toward both explaining and justifying the antiscientific attitudes it decries.

Koshland's derision might have been appropriate had it been limited to perpetual motion machines and quack medical cures. However, by implying that all who disagree with scientists on public policy issues are either stupid (not knowing how to "add") or malicious (rewriting the "laws of arithmetic" to their advantage), he dangerously trivializes the policy process. We cannot think of any significant public policy controversy where one side has insisted on the equivalent of "2 + 2 = 5," although we've seen quite a few where the technical evidence marshaled by one side's scientists was simply immaterial to the concerns raised by the other side.

Public policy issues with simple answers don't remain issues very long. The ones that stick around involve conflicting philosophies, values, or interests that go a little deeper than knowing how to add. Scientists who don't understand the limits of scientific contributions to policy debates risk not only personal embarrassment but political irrelevance.

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Koshland's interview with Dr. Noitall directs the discussion about the "poor" image of science into a debate based on public opinion. Missed is the opportunity to "educate" Dr. Noitall about "fourness." Rather than letting Noitall control the agenda, we all need to be able to direct such discussions into areas that can teach and possibly change opinions. How would the "public" respond if we were able to take what most people think is a simple problem with only one correct answer and provide an infinite set of correct responses?

Such an infinite set was provided by the programmers for the early PLATO system. They said that a proper computer program would accept many correct answers to the problem, "How much is 2 + 2?" Among their suggested answers were 2 + 2 = 5 − 1, 2 + 2 = 2 × 2, 2 + 2 = 8/2, 2 + 2 = 1 + 1 + 1 + 1, and even 2 + 2 = four, 2 + 2 = fore, and 2 + 2 = for.

It is not easy to get people to change their ideas, especially when the ideas are controversial and seemingly obvious. But if we cannot provide a new, different, or broader perspective, we may not even get their attention. Sometimes changing the question or redefining the problem is the only way to get that attention.

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Research Support for Head Start

Constance Holden's article "Head Start enters adulthood" (News & Comment, 23 Mar., p. 1400) overlooks prominent evidence about the positive effects of programs like Head Start. Holden refers to what "most researchers" say about long-term effects, although she appears to have interviewed only seven researchers, including only two who have conducted such research.

She repeats such glib characterizations of the research as "murky," "mushy," and "overblown" and even attributes to Sandra Scarr the indefensible statement that "there is no evidence. . . whatever" for the importance of early intervention.

Holden does not mention that the striking long-term findings of the Perry Preschool study are based on an experimental design with random assignment to experimental group and control group. She writes that other longitudinal studies have been unable to replicate the Perry findings when at least six other studies have replicated various long-term Perry findings (*1*). Five other studies found fewer students placed in special education or retained in grade; three found more youths graduating from high school; one found that students averaged higher on achievement; and one found fewer youths arrested. Although Holden implies that replication attempts have failed, the fact is that very few replications have been attempted.

Holden says that people "jumped" on the study with uncritical acclaim, but the study has in fact been scrutinized repeatedly—reported in five articles in refereed journals, six articles in education magazines, nine chapters in edited books, and four monographs that included reviews by independent reviewers. The American Psychological Association's Task Force on Prevention, after reviewing 900 programs and supporting research, selected the Perry program as 1 of 14 exemplary prevention programs (*2*). The National Mental Health Association gave David Weikart the 1987 Lela Rowland Prevention Award for the Perry Preschool program and its supporting research. The Research and Policy Committee of the Committee for Economic Development cited the Perry study in its publications (*3*) on the basis of scientific review (*4*). A review in *Educational Administration Quarterly* (*5*) calls the Perry Preschool study "a prototype of careful attention to design, instrumentation, and analysis." It continues, "Researchers of more emotional bent would not have been able to suppress their unbridled enthusiasm for the results. The program was a 'winner'. . . by anyone's standards."

Holden is correct that the Perry Preschool program and others like it were more rigorously designed and monitored and more intensive and expensive than is now typical in Head Start programs. But she does not proceed to the obvious implication: New investments in Head Start should be used not only to increase enrollment, but also to improve program quality. She is wrong when she says that little is known about how such programs work. The evidence indicates that effective programs usually (i) are well-staffed by adults trained in early childhood; (ii) provide a carefully supervised, developmentally appropriate curriculum; and (iii) involve parents as partners. The evidence also indicates that it is difficult to retain qualified teachers with the current average Head Start teacher salary of $12,074.

Field research can always be improved and replicated, but Holden's effort to discredit the research on programs like Head Start has done a disservice both to the researchers who have conducted such studies and the policy-makers who have examined and been inspired by them.

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Holden's article on Head Start and other intensive preschool programs for disadvantaged children gives an incorrect impression of what we know about the benefits of early childhood intervention.

For 15 years into the life of Head Start, academics, pundits and decision-makers argued whether the program produced long-term positive effects. Now, however, the evidence is in: it is abundantly clear that high-quality preschool programs do indeed generate long-term effects. What we don't know is exactly which factors mediate those effects; to discover the critical factors will be the research quest of the next 10 years. One promising hypothesis is that the key is to be found in the involvement of parents, a strong program element in Head Start, the Perry Preschool, James Comer's school model, Sally Provence's Child Welfare Project, the Syracuse Project, and Missouri's Parents as Teachers program. It seems that when parents become involved in their children's early education and are in turn helped with their own pressing problems, they gain a sense of control over their lives and become better socializers of their children for years to come.

I would also like to see Head Start receive the credit it deserves for its role as a national laboratory where developmental programs for America's children and families can be tried, evaluated and, when successful, launched into the mainstream. In this vein one thinks immediately of Head Start's Parent and Child Centers, the Homestart Program, the Child Development Associates Program, Education for Parenthood, and the Child and Family Resource Program, which inspired America's family support movement.

I concur with Holden that 1 year of early intervention is not enough for disadvantaged children. To give poor children a chance for an independent, productive life, we must offer appropriate social and educational support at every stage of development. Senator Edward Kennedy (D–MA) has just introduced a bill (S. 2363) for a Head Start Transition Program that would help Head Start programs and local schools work together and would continue Head Start's comprehensive program elements (health, parental involvement, and home visits) through the third grade. This is the direction in which we must go to achieve the best outcomes for children.

One last point. I was identified in the article as the first director of Head Start. Julius B. Richmond of Harvard University was Head Start's first director. From 1970 through 1972, I was the first director of the Office of Child Development (now the Administration for Children, Youth and Families). In that capacity, I was the public official responsible for Head Start.

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Response: My intent was certainly not to "discredit" research on preschool programs, but rather to suggest that such research is still at a preliminary stage and that some unrealistic expectations may have been generated. I gained this impression through interviews with more than two dozen people, including 17 researchers.

Indeed, Schweinhart stated in a debate with Gary Gottfiedson of Johns Hopkins University last year that "to be considered conclusive, the teen pregnancy, employment, welfare, school achievement, and arrest findings. . .need to be replicated in other studies."—CONSTANCE HOLDEN

Early Landscape Archeology

The approach to identifying synchronous cultural and environmental events and processes through stratigraphic exposures produced by bulldozer trenching ("Paleontology by bulldozer," Research News, 23 Mar., p. 1407) is an important step in the interdisciplinary study of early hominids and their environments in Kenya. The reader should be aware, however, that similar approaches were used before 1985 on Paleo-Indian sites in the American Southwest.

In 1962 at the Tule Springs Site in the Las Vegas Valley, Clark County, Nevada, Richard Shutler, Jr., and C. Vance Haynes used two bulldozers and a large motor scraper to excavate over 7000 feet of trenches in an area measuring 700 by 2200 feet that, in Haynes' words, provided "an unusual opportunity to study the late Quaternary sediments of the valley and to determine the chronostratigraphic position of artifacts, faunas, pollen samples, and radiocarbon samples" (*1*). This pioneering approach has been replicated by others in recent years, but not to the same scale. We are pleased to see that Richard Potts and his colleagues have successfully transferred this approach of "landscape archeology" to their hominid studies at Olorgesailie.

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Postdoc Tuition at Stanford

In a recent News & Comment article (20 Apr., p. 292), Marcia Barinaga described only one aspect of the financial burden facing those who attempt to conduct research at Stanford University. Fifteen years ago, Stanford realized a previously untapped source of income, the postdoctoral fellow. It was decided that postdocs should be classified as "students" so that tuition could be collected. At the current rate of $2200 per postdoc, the medical school alone accrues over $1.5 million annually. The tuition is typically paid out of the sponsor's research grant. This is in addition to the already high indirect costs (74%) at Stanford. In some cases, tuition is deducted from postdoctoral fellowship awards.

On 1 January 1990, the postdoctoral "students" became responsible for paying taxes on all monies paid for their tuition. They were informed of the situation in March 1990. In effect, a postdoc at Stanford now pays a fee for the privilege of working there. Letters have been written to all levels of administration, including the office of the president, but action is still pending.

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Erratum: In M. Mitchell Waldrop's Research News article "Particle physicists look to the heavens" (16 Mar., p. 1291), Raymond Davis' affiliation was incorrectly given as Brookhaven National Laboratory. Davis is Research Professor of Astronomy at the University of Pennsylvania.

Erratum: In the Briefing "Tyler Prize goes to Cornell scientists" (News & Comment, 30 Mar., p. 1539), it is incorrectly stated that the Tyler committee is based at the University of California at Los Angeles. The committee has been based for the past 10 years at the University of Southern California in Los Angeles.