population geneticists to write a Perspective, so that the public would at least know the subject was controversial.

I would do the same if we received a paper about global warming that extrapolated from data indicating gradual warming to a conclusion that we will all burn up in 10 years if we do not stop using fossil fuels. Some *Science* papers affect only a few scientists, and differing views can follow later in a classical tradition. Others, it seems to me, will cause headlines and confusion if a debatable point is exalted, even temporarily, into a fact.

As is now known, some of the statements made by Lewontin and Hartl about population genetics were erroneous. If anything, the genetic diversities of black and Hispanic populations are greater than that of Caucasians, and therefore the calculations by current methods based on a Caucasian population would benefit (but only slightly) an ethnic population.

What has been the result? The use of DNA testing has convicted many, including a gang murderer (the Yee case, in which Lewontin and Hartl testified for the defense); DNA evidence was admitted by the judge, and a jury convicted the defendant. The Federal Bureau of Investigation and Scotland Yard each have a record of not bringing to trial one-third of the accused in rape cases because the DNA evidence exonerates them. In a recent Pennsylvania case, a man accused of rape with high certainty was not arrested because the prosecutor said the DNA evidence showed he was not the criminal. The case was kept open, and eventually the real criminal was found. He bore a strong physical resemblance to the falsely accused individual. A similar case occurred in California. These cases illustrate that, in circumstances of high emotion, objective DNA evidence may be more reliable than eyewitness testimony. More and more courts are accepting DNA evidence, as indeed they should. Paternity cases, identity cases, and criminal cases are being resolved by a method that follows in the tradition of fingerprints as a tool for justice. Scientists who allow their political agendas to overwhelm their scientific objectivity should reflect on the consequences of that choice.

To bolster my statistics with regard to the opinion of scientists, I took a straw poll at a meeting of human genome scientists, experts in DNA use, but not involved in criminal court cases. To the question, "Do you believe DNA procedures by the RLFP [restriction fragment length polymorphism] procedure is accurate enough for use as evidence in court?" 3 of about 600 people voted "No," 15 voted "Don't know enough to judge," and the rest voted "Yes."

Lovell's depiction of statistics seems to me to be so incorrect that I find it difficult to answer him. Statistics are highly relevant to a single event in a courtroom, such as when a plaintiff says a pesticide caused cancer in her child. Such an allegation should be weighed against the fact that 24% of deaths in the United States in 1990 were from cancer. I say, "Thank God" for the increasing number of judges who understand that DNA fingerprinting is a new and powerful tool to absolve the innocent (often in the face of conflicting eyewitness testimony) or to convict the guilty (often in the absence of eyewitness testimony). Fortunately for justice, an increasing number of judges are admitting DNA evidence in courtrooms, and states, such as California, are keeping DNA information about felons.

—Daniel E. Koshland Jr.

■

"Real-World Experience" in Chemistry

In his editorial of 6 May (p. 755), "Reorientation of research objectives," Philip H. Abelson quotes John Armstrong, former IBM vice president for research, as saying

> there is little or no encouragement, and a lot of implicit discouragement, for the young person who wants to spend time during graduate school off campus in a setting where technical knowledge is actually used. There is, in short, almost no value assigned to technical breadth or to real-world experience as an essential part of Ph.D. training.

Abelson goes on to urge that "this . . . deficiency . . . be repaired."

The Doctor of Chemistry program at the University of Texas at Dallas, which was designed to prepare students for careers as doctoral-level problem-solvers in chemical and chemical-related industries, is a vital example of an academic program that *does* direct its students toward "real-world experience." Each graduate of the program has spent a mandatory year as a full-time employee in an industrial or government research and development laboratory and has prepared and defended a report on his or her technical accomplishments during that year.

Our program includes a broad chemistry curriculum, with courses emphasizing industrial chemistry, materials science, and problem-solving, and three approximately year-long research "practica." The program has existed for 12 years and has placed graduates at firms such as BASF, DuPont, Mallinkrodt, United Technologies, Motorola, and Syntex, and at the Los Alamos National Laboratory.

We encourage industrial interaction and pride ourselves on the readiness of our Ph.D. graduates for industrial careers. Our program can serve as a model for others who seek ways to carry out Abelson's advice.

Lynn A. Melton
Department of Chemistry,
University of Texas at Dallas,
Box 830688,
Richardson, TX 75083–0688, USA

■

Assigning Research Projects

The importance of ethics in research is aptly underscored in Caroline Whitbeck's letter about overlapping research topics (19 Aug., p. 1020). She justifiably wonders whether it is wise for senior researchers to assign overlapping dissertation projects to graduate students and postdocs. In deploring the overlap and its attendant destructive competition, Whitbeck does not address the equally questionable practice of assigning topics in the first place.

If the goal of graduate study or postdoctoral training is to educate independent, creative scientists, then the choice of a research topic should be made in large part by the student, with advice from senior researchers. As fields become technically more sophisticated and team research is being encouraged strongly by funding agencies, top-down science is spreading. It may be robbing initiative and independent thought from many young scientists and placing too many decisions about the direction of research in the hands of too few people.

Geerat J. Vermeij
Department of Geology and
Center for Population Biology,
University of California,
Davis, CA 95616, USA

■

Constant Caesar, Not Cassius

John Travis (Research News, 16 Sept., p. 1660) says that "Shakespeare's Cassius described himself as 'constant as the Northern Star.' " It was Julius Caesar, not Cassius, who said this, just before he was assassinated (*Julius Caesar*, act 3, scene 1, line 60), and it was this vanity of Caesar that led Cassius to plot his death ("Why, man, he doth bestride the narrow world like a Colossus.")

Thomas H. Jukes
Department of Integrative Biology,
University of California, Berkeley,
Oakland, CA 94608, USA