# LETTERS

## Paleoanthropological Contexts

I can't stand it anymore! You're driving me and most of my colleagues crazy with your "Golly, Mr. Science!" approach to paleoanthropology. One would think that there is no epistemological infrastructure whatsoever to paleoanthropological research protocols and that the whole enterprise is entirely "discovery-driven."

Paleoanthropology is admittedly underaxiomatized, and there is no mandate for its practitioners to tell us where they are coming from conceptually or paradigmatically. However, some of us, at least, are aware of epistemological issues and of the necessity for making explicit the inferential basis for our claims of knowledge. This tends to be more of a problem in a nonexperimental field like paleoanthropology than it is in a "big science" context. Unfortunately, most of the workers who dig up the fossils are essentially strict empiricists who wouldn't recognize a paradigmatic bias if they tripped over one. However, this deplorable situation is not much helped by a tendency to deal with the "facts" as if they actually "spoke for themselves." Facts do not exist apart from the conceptual frameworks that define them. To paraphrase Milford Wolpoff, I have been in rooms with "facts" (data) and listened very carefully. They never said a word.

**G. A. Clark**
*Department of Anthropology,
Arizona State University,
Tempe, AZ 85287–2402*

## Teraflop Computers

The arguments presented in Gordon Bell's Perspective on teraflop computing (3 Apr., p. 64) are based on two incorrect assumptions about massively parallel computers. First, massively parallel computers are not only applicable to "specialized, highly parallel applications." We now have experience with hundreds of massively parallel machines in thousands of scientific applications. Massively parallel computers have been successfully applied to almost all types of large scientific computations, including high energy physics, global climate modeling and geophysics, astrophysics, linear and nonlinear optimization, computational fluid dynamics and magnetohydrodynamics, electromagnetism, computational chemistry, computational electromagnetics, computational structural mechanics, materials modeling, evolutionary modeling, and neural modeling. They have also excelled in all the major categories of numerical methods, including finite difference and finite element schemes, direct methods, Monte Carlo calculations, particle-in-cell methods, and *n*-body problems. Experience indicates that massively parallel machines are applicable to any scientific problem that involves the processing of a large amount of data.

Second, massively parallel machines do not require special programming languages. Most applications on massively parallel machines today are written in FORTRAN 90, the International Standards Organization FORTRAN standard. It is also possible to program massively parallel machines in FORTRAN 77 (*2*). Massively parallel machines often require program restructuring to take advantage of parallelism, but they do not require special languages.

Bell also argues that large-scale teraflop machines should not be built because they will be less expensive if we wait a few years. This argument applies equally well to any type of computer. Applied in retrospect, it suggests that any computer purchase in the last three decades was a mistake.

The criteria for deciding whether to build teraflop computers should be the same as for any other large-scale scientific tool. Is the cost justified by the potential scientific and economic gains? In several applications, such as global climate modeling, quantum chromodynamical lattice calculations, and protein structure prediction, the answer is yes.

**W. Daniel Hillis**
*Thinking Machines Corporation,
245 First Street,
Cambridge, MA 02142*

### REFERENCES

1. B. M. Boghosian, *Comput. Phys.* 4, 1 (1990); G. C. Fox, *Concurrency* 3, 725 (1991).
2. G. Sabot, L. Tennies, A. Vasilevsky, R. Shapiro, in *Scientific Applications of the Connection Machine*, H. D. Simon, Ed. (World Scientific, River Edge, NJ, ed. 2, 1992), pp. 364–378.

## Confidence in Science

Recent editorials by Philip H. Abelson (3 Apr., p. 9) and Norman Hackerman (10 Apr., p. 157) express concern about diminishing public support for science, especially because of such issues as research misconduct and constriction of resources and controversies about indirect costs and the use of animals. Has the public indeed withdrawn its support?

Public confidence in several American social institutions, including science, was measured in opinion polls in 1966 and then nearly every year after 1971 (*1*). Interviewers told respondents, "I am going to name some institutions in this country. As far as the people running these institutions are concerned, would you say you have a great deal of confidence, only some confidence, or hardly any confidence at all in them?"

Confidence in American institutions was extraordinarily high in 1966 compared with any year afterward (*2*). However, since 1971, when annual polls were initiated, there has been little if any overall degradation. In 1991, confidence increased sharply in the military and the press, no doubt a result of the war with Iraq.

Of about 13 institutions rated for confidence in these polls, medicine and science nearly always ranked first and second, respectively. Looking beyond year-to-year fluctuations, confidence in science has had a slight upward trend since 1971, while medicine has experienced a clear decline. If these trends continue, and the military's surge of popularity is short-lived, then science will soon lead all other institutions in public confidence.

*Allan Mazur*
*Public Affairs Program,*
*The Maxwell School,*
*Syracuse University,*
*Syracuse, NY 13244*

**REFERENCES**

1. *Curr. Opin.* 1, 3 (1972); J. Davis, T. Smith, B. Arnold, *General Social Surveys, 1972–1991: Cumulative Codebook* (National Opinion Research Center, Chicago, IL, 1991), pp. 197–200.
2. A. Mazur, *Soc. Stud. Sci.* 7, 123 (1977); S. Lipset and W. Schneider, *The Confidence Gap* (Free Press, New York, 1983); National Science Board, *Science & Engineering Indicators—1989* (Government Printing Office, Washington, DC, 1989), pp. 172–173.

## AIDS Epicenter

With reference to Steve Sternberg's Research News article of 15 May (p. 966) about the source of the AIDS virus, I would like to express my concern about any premature conclusion that may have been drawn. There is no scientific support for the suggestion that Gabon was the source of AIDS. Gabon has one of the lowest AIDS infection rates among African nations, and the idea that it might be the "epicenter" of the virus contradicts the Darwinian rules of