Letters

The Space Station Revealed?

A ScienceScope item of 3 January (p. 19) refers to NASA's space station as one of "the nation's premier Big Science projects." I am discouraged to see again that technological goals are equated with science all too easily.

The space station will undoubtedly be a grandiose triumph for engineering and technology. But a "big science project" it is not. Contrary to the Superconducting Super Collider, or to space missions such as, among others, the recently launched Gamma Ray Observatory, the space station is not being planned in response to scientific needs. In fact, most of the science payloads that were considered for attachment to the station fell victim to cancellations. This has led to a great deal of indifference toward the space station within the scientific community.

While acknowledging the technological and political motivations for the space station, one must realize that the station is likely to be an "emperor without clothes" in the basic sciences.

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Sagan's Scenario

Carl Sagan writes (Letters, 6 Dec., p. 1434), that he "was surprised to see in Michelle Hoffman's article 'Taking stock of Saddam's fiery legacy in Kuwait' (Research News, 30 Aug., p. 971) an attribution [to him] of what are described as 'doomsday scenarios . . . that the [oil fires in Kuwait] could touch off a global warming catastrophe. . . .' " He then says that the concern that he and his colleagues expressed before the fires were set "was about much more minor effects, both in geographic extent and severity. . . ."

The fact is that Hoffman's account of the scenario predicted by Sagan is correct. According to a transcript of an interview on ABC's *Nightline* on 22 January 1991 (*1*), Sagan stated,

> We think the net effects will be very similar to the explosion of the Indonesian volcano Tambora in 1815, which resulted in the year 1816 being known as the year without a summer. There were massive agricultural failures in North America and in western Europe, and very serious human suffering, and in some cases starvation. Especially for South Asia, that seems to be in the cards, and perhaps for a significant fraction of the Northern Hemisphere as well.

During the program, Sagan disagreed with another scientist who predicted that no global effects would occur.

Hoffman and *Science* are to be commended for reporting this matter.

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REFERENCES

1. C. Zimmer, *Discover* **13** (no. 1), 37 (1992).

Lead Study Challenge

Joseph Palca's article, "Get-the-lead-out guru challenged" (News & Comment, 23 Aug., p. 842) reported that the methods of data analysis in a widely cited study of the effects of lead on children were being challenged. This study, by Herbert Needleman of the University of Pittsburgh, has been given a significant role in the formation of governmental policies regarding the setting of standards for lead exposure. One of the more recent documents that has relied on the findings of this study is *Preventing Lead Poisoning in Young Children, A Statement by the Centers for Disease Control* [*CDC*], October 1991. Because following the guidelines is expected to divert resources from other health care needs, the integrity of materials relied on is not a trivial matter.

Problems exist in the study that are visible to anyone with the opportunity to review the materials and the knowledge required to understand the methods. The challenge (*2*) was based primarily on an inspection of dated computer outputs which indicated that the results of appropriate early analyses of the data were not statistically significant for primary outcomes, including IQ. These were replaced by analyses that removed an important confounder, age of child. The replacement analyses also deleted the data for 40 to 50% of the children in the study. These two strategies yielded the statistically significant results that were published.

There were many other outcome variables for which results were not published, which raises the issue of multiple comparisons in a large dataset as well as concerns about nonpublication of important variables, such as language skills and parental ratings of behavior.

In his letter to *Science* (25 Oct., p. 500) Needleman does not account for these problems. Instead he makes a number of misleading statements.

To our knowledge, the reports (*3*) prepared by the Environmental Protection Agency's (EPA's) Expert Committee on Pediatric Neurobehavioral Evaluations did not bear caveats when they were distributed to reviewers. The committee, of which one of us (S.S.) was a member, read Needleman's response to the reports and concluded that "the Committee knows of no studies that, to date, have validly established (after proper control for confounding variables) a relationship between low-level Pb exposure and neuropsychologic deficits" (*3*, p. 41).

We find no statement in the EPA docket (*4*) which shows that Needleman "provided raw data and access to tapes to EPA's statisticians. . . ." We find no statement by the EPA statistician, Hugh Pitcher (*5*), concerning access to data or tapes of data, nor did he report analyses made by him of such a dataset. He appears to have accepted as sufficient the analyses provided by Needleman (*6*). Pitcher dismissed problems with the study, giving as a reason, "the study does not purport to extrapolate the results to the general population . . ." (*5*, p. 11).

In 1983, while the EPA Expert Committee was reviewing this study, EPA awarded Needleman grants (CR-811041 and CR-810937) for further analyses of the data. In the published report (*7*), which had the stated purpose of responding to skeptics, age of child was still not included in these analyses, and a different group of cases (those with IQ's below 70) was excluded.

Needleman was the primary author of the background chapter of the CDC document. This chapter included two graphs, the first of which summarized results from seven other studies and consisted primarily of data that had not been adjusted for known confounding variables. The second graph, attributed to Needleman's 1979 study, was also of data not adjusted for confounding variables. This previously published graph (*8*), however, was revised without comment in the CDC document to include additional children with low IQ's in the high-lead group.

Needleman mentions in his letter the results of three meta-analyses. Two were done by Needleman; the other was an analysis of six studies conducted at EPA. None takes the confounding variables fully into account.

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