30 May, these studies, "unprecedented in this country," will be conducted in cooperation with the state of Pennsylvania. As explained by HEW Secretary Joseph A. Califano, Jr., the ultimate purpose of the studies is to create a data base for a variety of future studies. The focus of these studies is to be the relationship between health histories, such as leukemia and birth defects, and the irradiation exposure caused by the accident.

The particular point I wish to emphasize is that the reliability of studies of the kind mentioned requires that they include not only the details of exposure to radiation, but also the exposures to noxious chemical pollutants as studied by the Food and Drug Administration. Quite a few of them are mutagenic and/or carcinogenic. Obviously, if any such pollutants were present in the ambient air in the localities studied, without being monitored and without being included in the analysis, then their health effects would be ascribed to radiation. Hence the sense of this letter: When studying health effects of irradiation, include chemical pollutants.

Another warning of a statistician is, Beware of "spurious correlations!" That is, when studying populations exposed and cases of leukemia and so forth, do not use "rates"; use actual numbers of people and numbers of leukemias counted (*2*).

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"Female Evanescence"

The most puzzling aspect of "Burt's missing ladies" (Letters, 8 June, p. 1035) is that their nonexistence went unnoticed by the relatively small and tightly knit research community of which they were ostensibly members. Surely Conway's colleagues in the psychology department at University College, London, could have been expected to comment when a paper published from their department was authored by someone unknown to them.

A possible explanation for this curious lack of response is that women scientists are very frequently overlooked by their colleagues, a recent case in point being the failure to nominate Candace Pert for a Lasker Award (*1*). As a psychologist of many talents, Burt undoubtedly recognized that the scientific community would not be at all disturbed by the evanescence of his female "collaborators" and that members of the psychology department at University College could safely be assumed to accept Conway as one of those invisible women to whom it was not necessary to pay attention.

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Energy: A Greater Risk?

The rather lengthy critique by Holdren, Smith, and Morris (Letters, 11 May, p. 564) of Inhaber's article "Risk with energy from conventional and nonconventional sources" (23 Feb., p. 718) deserves comment, not so much for what it says but for what it doesn't say. There is undoubtedly value in ranking comparative risks of producing energy from conventional and nonconventional sources, particularly from the standpoint of determining where efforts may be most usefully directed to reduce prevailing risk levels. However, in terms of the magnitude of today's energy problem and its threat to national interests, such assessments appear somewhat akin to rearranging deck chairs on the *Titanic* as she glides through North Atlantic waters.

With our heavy and increasing dependence on foreign petroleum supplies, the United States is in a precarious position. As we have seen, these supplies can be interrupted and prices can be escalated with serious consequences. The loss of Iranian production provides a graphic example of the risks inherent in excessive dependence on foreign energy supplies. The consequences of the loss of another several million barrels a day of foreign oil supplies, for whatever reasons one might wish to postulate, would be far more serious. Such an event, rather than inconveniencing drivers and disrupting holiday and vacation plans, could begin to undermine the fundamental stability of our economy and the well-being of our population. Employment levels, adequacy of fuel supplies for home heating, and agricultural production could each, for example, be affected. These developments, in turn,

could have profound effects on public health. Surely, these risks must transcend those which may be associated with the development of various domestic energy sources.

Not included, of course, is the jeopardy in which the security of our nation itself would be placed if we were deprived of substantial volumes of imported petroleum over an extended period.

The point is, we as a nation must move ahead aggressively with the development domestically of *both* conventional and nonconventional energy sources and reduce our reliance on imported petroleum. The seemingly endless discussions as to which energy source may be preferable or appear unacceptable and how best to tackle the problem are strictly counter to overall national interests. Time is short, and we must get our act together before it's too late. Many of us would like to see the scientific community in the vanguard of this effort.

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Heavy Crude Oil

Eliot Marshall's article "OPEC prices make heavy oil look profitable" (News and Comment, 22 June, p. 1283), which is concerned with the conference on Heavy Crude Oil and Tar Sands organized by the United Nations Institute for Training and Research (UNITAR), the U.S. Department of Energy (DOE), and the Alberta Oil Sands Technology and Research Administration (AOSTRA), contains a statement which, I believe, should be clarified. Referring to me he writes: "Apparently he found the major American oil companies inimical to his vision, for he said he consciously chose not to invite them. He did not explain further. The companies' Canadian affiliates and subsidiaries did attend, however."

There was no anti-American bias in the selection of the participants. The largest number of participants came from the United States. However, we wanted oil companies interested in attending to write papers and share their knowledge and experience with other participants at the conference. That principle was applied to companies from all of the industrial countries. We were especially interested in obtaining papers on the occurrence of heavy crude from the major international oil companies, because most of them have some knowledge of its occurrence in practically all countries of the world. We failed in this attempt; not one single paper was submitted by any of the oil compaines on the occurrence and potential of heavy crude for any country outside of Canada. The papers we had on occurrences were written by academics or government experts and were very incomplete, including the paper from the United States. A vice president of one company told me at an early stage of preparation for the conference that no company would be willing to release such data, and his observations proved correct. Finally, we compromised and accepted papers from such companies dealing with other aspects of heavy crude and tar sands. Thus, in effect, all companies interested in the conference were able to participate. There were only two European companies who refused to write any papers, and they did not attend.

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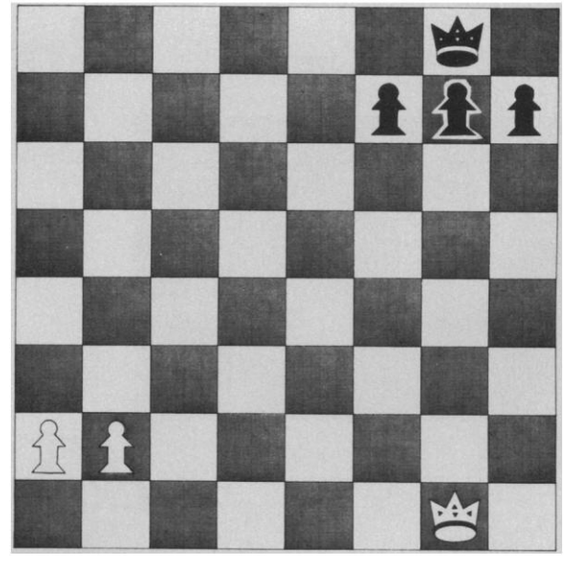
Erratum: In the Research News article "Tournament competition fuels computer chess" (29 June, p. 1396), the figure was reproduced incorrectly. Black has a third pawn on the black square immediately in front of the black king. The figure and its legend are reproduced herewith.



One limitation of full-width search methods in computer chess is called the horizon effect. A human easily sees that white, although it has one less pawn, can win the game by advancing its leftmost pawn across the board, whereupon it is promoted, by the rules of chess, to a queen. The computer, if it does not search enough moves into the future, will not see this outcome and will be excessively concerned about black's apparent material advantage. [*Drawing by Eleanor Warner*]