SCIENCE

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LETTERS

What's next for the national labs?

The post–Cold War role of the national laboratories continues to be discussed, as indicated by letters from James J. Duderstadt and Ernest M. Henley. Duderstadt suggests that Fermilab (right) "is an excellent example of a high-quality federal laboratory whose *primary* mission is to support the basic research of university-based scholars." Meanwhile, Los Alamos and Livermore continue to study the question of nuclear waste disposal, as described in a letter from Bowman and Venneri.

Changing Priorities?

We as a nation need to reconsider the respective roles and relationships between national laboratories and research universities during this period of changing national priorities and shrinking financial resources.

I regret that this message did not come through clearly in a news item in which I was quoted (ScienceScope, 26 May, p. 1119). My comments were part of a discussion about the future of the American research enterprise—including research universities, national laboratories, and industrial laboratories—during a 2-day strategic planning meeting of the National Science Board (NSB).

While national Department of Energy laboratories such as Argonne, Brookhaven, and Oak Ridge do cooperate with research universities, their primary focus traditionally has been strongly influenced by their particular national missions. As these missions have shifted and their centrality to the national agenda has diminished, the future of many of these laboratories has become a subject of national concern and debate.

At the NSB planning meeting, I suggested that the primary missions of several of these national laboratories might be realigned to enlarge the extent to which the national laboratories serve as the focal point for large-scale, interdisciplinary, cooperative research by research universities. Fermilab is an excellent example of a high-quality federal laboratory whose *primary* mission is to support the basic research of university-based scholars. During a time of constrained resources, we need to consider if other national laboratories could enhance their collaborative roles. Without such strategic discussions, there are those who fear that many of these laboratories will shift their missions, becoming direct competitors with research universities for limited research dollars rather than stronger partners in the research enterprise.

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In the ScienceScope item "National labs up for grabs?" an opinion is advanced that the Brookhaven National Laboratory (BNL) has outgrown its original purpose of "designing nuclear reactors" and that it could make a major basic research contribution by being aligned with a coalition of universities dedicated to performing basic research and training of scientists.

BNL *is*, and always has been, aligned with a group of universities, it *is* making major basic research contributions, and it does a heck of a lot more than designing nuclear reactors. For instance, it operates the National Synchrotron Light Source and it is building the world's largest nuclear physics facility (a relativistic heavy ion accelerator) for basic research.

Associated Universities, Inc. (AUI), founded nearly half a century ago by a consortium of universities to establish BNL, has operated the laboratory in exemplary fashion since that time. Under its charter, AUI is commissioned in all areas of science to plan, develop, construct, operate, and manage large-scale research facilities that fulfill a national need and serve the scientific community. It is also responsible for the development and maintenance of research programs of the highest quality as well as for the education and technical

training of research personnel and students.

The active AUI Board of Trustees, which oversees AUI and the laboratory, has been drawn almost exclusively from university scientists and administrators. At present, the board includes two Nobel Laureates, four National Medal of Science awardees, and many scientists who have received prestigious awards for their research. The members of this distinguished group have given freely of their time and energy because of the high quality of the scientific work being carried out at the laboratory. Also, AUI reaches out to a broad community of active scientists to review (on an annual basis) the quality and progress of its programs at BNL.

BNL, of all the multidisciplinary national laboratories funded by the U.S. Department of Energy, has an unmatched history of interactions with, and service to, the university research community. At present there are more than 4250 research guest users and collaborators associated with the laboratory.

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Nuclear Waste Storage at Yucca Mountain

Regarding the News & Comment article "Blowup at Yucca Mountain" by Gary Taubes (30 June, p. 1836), geologic storage originally was conceived for the storage of wastes from the fission process, not for the fissile material itself. In most of the world this is still the envisaged goal for geologic storage. However, in the 1970s, the United States decided to put not just the remnants of the fission process underground but also the spent fuel, which contained plutonium. Geologic storage also is being considered for the permanent disposition of large amounts of highly enriched spent uranium fuel from research reactors and national defense reactors. More recently, the Department of Energy (DOE) has been considering geologic storage of the many tons of weapons plutonium from the weapons stockpile reductions as well. Our paper, discussed in Taubes's article, does not attack the geologic storage of all types of nuclear waste at a site such as Yucca Mountain; it addresses the criticality safety of storing fissile material that originally was not intended to be present.

Upon finishing the first draft of our paper, we felt the need for external feedback. After five external copies had been sent out and the report had been circulated internally and at high DOE levels in early December 1994, concern arose about the political sensitivity of the work, and an internal review was organized at Los Alamos. We authors were not allowed to participate in these proceedings. We were only to be present at a final discussion, where we could respond if called upon. We prepared a 27-page point-by-point rebuttal to the review, but for the most part it was ignored.

The usual scientific process of presentation at technical meetings and refereed journal publication has gone forward in spite of this episode. Our paper has been accepted for publication by *Science and Global Security*. We were satisfied with its reception at a special plenary session of the annual summer meeting of the American Nuclear Society arranged for its exposition and criticism.

As for James Mercer-Smith's taking offense at the idea of nature being able to make a bomb, we note that nature has never had plutonium or highly enriched uranium in 1000-ton quantities at one site to work with, at least not for the past several billion years. The first step in nature's process would be dispersion from the