

The Regents of the University of California

**COMMITTEE ON EDUCATIONAL POLICY
COMMITTEE ON OVERSIGHT OF THE
DEPARTMENT OF ENERGY LABORATORIES**

July 15, 1999

A Joint Meeting of the Committee on Educational Policy and the Committee on Oversight of the Department of Energy Laboratories was held on the above date at UCSF-Laurel Heights, San Francisco.

Members present: Representing the Committee on Educational Policy: Regents Atkinson, Connerly, Davies, O. Johnson, Khachigian, Kozberg, Lansing, Pannor, and Taylor

Representing the Committee on Oversight of the Department of Energy Laboratories: Regents Atkinson, Davies, S. Johnson, Khachigian, Montoya, Preuss, and Vining

In attendance: Regents Bagley, Hopkinson, and Lee, Regent-designate Kohn, Faculty Representatives Coleman and Dorr, Secretary Trivette, General Counsel Holst, Assistant Treasurer Young, Provost King, Senior Vice President Kennedy, Vice Presidents Broome and Darling, Chancellors Berdahl, Dynes, Greenwood, Orbach, Vanderhoef, and Yang, Laboratory Director Browne, and Recording Secretary Nietfeld

The meeting convened at 2:50 p.m. with Committee on Educational Policy Chair Connerly presiding.

RESEARCH COLLABORATIONS BETWEEN CAMPUSES AND UC-MANAGED LABORATORIES

The Committee was informed that collaborations between the UC-managed Department of Energy Laboratories and UC campuses involve a wide range of mechanisms and topics. Many, if not most of the collaborations are initiated by individual researchers and are not managed or even tracked by the University because no transfer of funds is involved. Publications in technical journals provide some insight into the extent of these interactions.

Other collaborations are fostered through a variety of mechanisms including joint appointments, major research facilities, and research institutes. A small but important fraction of the collaborations are supported by funds that derive from the fees paid to the University for managing the laboratories. All of these interactions provide a variety of benefits to the campuses, the laboratories, and the State of California, including the education of students, research advances, and economic development.

As background material, the three laboratories have provided the summaries of their collaborations with academia, and with the University of California in particular, copies of which were mailed to the Regents in advance of the meeting. Each of the laboratories has its own unique character that influences the specific makeup of its collaborative interactions. The summary provided by the Lawrence Berkeley National

Laboratory, while over a year old, is still qualitatively accurate in describing that laboratory's close interactions with the Berkeley campus, as well as its range of interactions with other campuses. An update is also provided that highlights three major advances that have come from collaborations. The Lawrence Livermore National Laboratory report notes the formation of its University Relations Program and describes five research institutes and a variety of educational and collaborative programs. The Los Alamos National Laboratory document describes three of its unique research facilities, its research centers and institutes, and collaborative research programs. Each laboratory reports the scope of the collaborative interactions occurring with UC faculty and students.

Provost King noted that benefits to the campuses and the faculty of these research collaborations include access to unique research facilities, unique learning opportunities for students, and the opportunity to work in interdisciplinary and multi-disciplinary teams. The laboratories derive benefit from working with world-class academic researchers. In listing some statistics, Provost King noted that in 1998 over nine hundred scholarly publications were co-authored by faculty researchers and laboratory staff; of these, a substantial number were with UC co-authors. The laboratories provide an opportunity for students to engage in research during the summer months, and at the Los Alamos National Laboratory, one-third of postdoctoral fellows remain as staff. Commenting on the use of the management fee, Provost King noted that \$1.5 million funds the campus-laboratory collaborations program on an annual basis, while two organized research units, the Institute for Geophysics and Planetary Physics and the Institute for Global Conflict and Cooperation, derive their funding from an additional \$1.5 million of the fee. In addition, UC-funded research and development funds make up the portion of the management fee that is allocated to the national laboratories for flexible research purposes, providing that the funds are not required for Department of Energy cost disallowances. Provost King then called upon Professor Andrew Clifford of the Davis campus to describe collaborative research that is being performed at the Lawrence Livermore National Laboratory's Advanced Accelerator Mass Spectrometry facility.

Professor Clifford explained that the accelerator mass spectrometer is an instrument that measures very low concentrations of label nutrients. Good nutrition is a cost-effective way to achieve optimal health and to prevent chronic disease. Several years ago nutrition researchers at the Davis campus reached the conclusion that, in order to advance the field of nutrition, they needed to be able to measure label nutrients at very low levels, and the accelerator mass spectrometer offered an ideal opportunity to do so. Researchers from fields as varied as astrophysics and nuclear engineering have participated in this work.

Professor Clifford discussed his work with beta-carotene, which is a source of many important nutrients. Beta-carotene is an anti-oxidant, and its derivatives can be used by the body for tissue repair and for vision. Several large clinical trials using beta-carotene found that it was harmful to people who were at high risk for lung cancer, which was not the outcome that had been anticipated by the researchers. As a result of these studies, the research team was able to investigate the paradoxical behavior of beta-carotene in human subjects. Grant funds of \$1.2 million for this research have been provided to date by the National Institutes of Health, while the Lawrence Livermore National Laboratory has received \$7 million to make

accelerator mass spectrometry available to the bio-medical community. Professor Clifford reported that the results of this research are being studied by the National Science Foundation's Food and Nutrition Board, the panel charged with recommending what Americans should eat to obtain optimal health.

Professor Mark Richards of the Berkeley campus described his research on the fundamental forces that create earthquakes. He noted that this research benefits from his association with the national laboratories. Most earthquakes occur along plate boundaries such as California, and the field of plate tectonics involves the study of how plate boundaries interact. The underlying causes of why plate boundaries move is one of the challenges of earth sciences; significant progress has been made in understanding those causes through collaboration with the Los Alamos National Laboratory, doing work that would not have been possible to do in the University environment alone. Researchers perform large-scale numerical computations to simulate the fluid dynamic motions in the earth's interior, which is facilitated by the computing facilities at the laboratory. Professor Richards stressed that the influence of fundamental scientific questions in the national laboratories is essential to the intellectual environment of the laboratories. The research which he and his colleagues performed on plate tectonics had a major influence on the way massively parallel computing is done at Los Alamos due to the innovation in algorithmic development that was provided by his then-graduate student, Peter Bunge.

Professor Bunge, currently a faculty member at Princeton University, provided his perspective as a student working at the Los Alamos National Laboratory. He recalled that when he arrived at Los Alamos he was asked to do research on a novel way of computing, using many computers to form a supercomputer. He learned that this method worked well, and today it forms the backbone of high-performance computing at the laboratory. Professor Bunge pointed out that the advantage to the laboratory was that he performed this research as a student, and thus the laboratory was not required to use its paid staff to test this computer technique. His experience at Los Alamos exposed him to researchers in many fields other than his own. In addition, he found that the environment at the national laboratories is one of collegiality rather than the traditional student-teacher relationship that is more typical on the campuses.

Regent Lee observed that two of the presenters were not born in the United States, which reflects the global nature of science. He agreed with the premise that both the University and the laboratories benefit from their collaborations.

The meeting adjourned at 3:20 p.m.

Attest:

EDUCATIONAL POLICY/OVERSIGHT
OF THE DEPARTMENT OF ENERGY
LABORATORIES

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Secretary