governments," as NAS president Philip Handler referred to the Soviet body politic in a recent interview with *BioScience*—has no obvious resolution, but in any event the academy has responded to the desire of its members to test the efficacy of a public role.

Other scientific societies have also begun to take a more active interest in the fate of their oppressed colleagues abroad. The Panel on Public Affairs of the American Physical Society voted last year that the APS president should go to Moscow to express concern to Soviet scientist-officials for the situation of the human rights activists and to give a talk at the physics seminar organized by refusenik Mark Azbel. But APS president William A. Fowler didn't want to go. "One could not accomplish both of these purposes in one trip if everything was to be done in an above-board manner," Fowler comments in the April issue of *Physics Today*. Instead, he forwarded a letter from the panel to the president of the Soviet Academy of Sciences. The APS is awaiting a reply.

A more direct approach has been followed by APS member Brian Schwartz of the MIT magnet lab. After addressing the APS meeting in Washington, D.C., last week, Schwartz led a group of seven physicists to the Argentine embassy to protest the abduction of his friend and colleague Antonio Misetich.

—NICHOLAS WADE

ERDA Laboratories: Los Alamos Atracts Some Special Attention

The University of California (UC) has run the Los Alamos nuclear weapons laboratory for the government since 1943. When the contract came up for another 5-year extension—it was due to expire in September—the UC link with Los Alamos came under attack from two directions. Organized opposition to UC operation of weapons research facilities, a carry-over from the antiwar movement of the 1960's, has waxed in the past year (see box). And the increase in nonmilitary work at Los Alamos, particularly the buildup of energy R & D by the Energy Research and Development Administration which owns Los Alamos, has prompted objections of a different sort.

The main source of these objections to the UC–Los Alamos link was a new consortium of universities in the Rocky Mountains and High Plains states—known as Western Regional Scientific Laboratory, Inc.*—which submitted a proposal to ERDA in February to replace UC as contractor for Los Alamos. The view in these universities was that Los Alamos Scientific Laboratory (LASL) was assuming the role of a regional energy laboratory without adequately involving state officials and university researchers in research and policy decisions. Consortium members say that the initiative was summarily rejected at the behest of ERDA assistant administrator for national security, General Alfred D. Starbird. In early April ERDA and UC signed a 5-year extension of the contract for Los Alamos and also one for the Lawrence Livermore Laboratory, a second major weapons lab 40 miles from Berkeley. (UC also operates the Lawrence Berkeley Laboratory and three small specialized biomedical and environmental labs for ERDA.)

The issue was subsequently raised with the Colorado delegation in Congress and a memorandum outlining the consortium position from Colorado State vice-president for research George C. Olson, was forwarded to the White House by Senator Floyd K. Haskell, who endorsed the request in the memo for an independent review of the contract procurement procedures for the management of the weapons labs.

Haskell received a reply from White House congressional liaison chief Frank Moore indicating that the matter had been referred to President Carter's energy adviser James R. Schlesinger, who in turn forwarded it to ERDA.

The consortium's proposal to take over the management of LASL was grounded on the argument that a region with vast energy resources and a fragile ecology, where exploitation of resources was inevitable, badly needs a regional energy laboratory working in close collaboration with other technically competent groups in the region. LASL was a logical candidate for the role, and the consortium offered to take over the functions performed by UC and, in addition, offer "a scientific advisory function, peer review and a broader based management support."

The response to the proposal was described in the following terms by the Olson memo:

> When the office of General A. D. Starbird, Assistant ERDA Administrator for National Security, learned of our activity "all hell broke loose". A vindictive and personal campaign was waged against Dr. Paul Silverman, Vice President for Research at the University of New Mexico, who carried the primary responsibility for this activity. Finally, at a meeting in Los Alamos last January 31st, General B. Giller [Starbird's deputy] told the assembled university representatives that the Assistant Administrator for National Security had no intention of changing the arrangement they had with the University of California and had, in fact, begun negotiations with them last fall for a new five-year contract to begin in *September 1977*.

There was a delay in getting the memo into the hands of ERDA officials and so they have not yet commented on it, but they have pointed out that Starbird, in a letter sent to Silverman in late March in which Starbird explained why he was returning the consortium proposal, suggested that the universities continue discussions with Eric Willis, ERDA assistant administrator for institutional relations, "on the broader questions of regional research and development and the role your institution can play." These officials made it plain, however, that weapons work is still the primary mission of LASL as far as ERDA is concerned.

After the rebuff, the members of the consortium concluded that Starbird's response was definitive. The consortium has now approached ERDA with a proposal that the Western Regional Scientific Laboratory explore the potential for interuniversity energy R & D projects for ERDA and also look into the matter of expanding collaboration with LASL.

While the consortium has dropped its bid for the LASL operating contract, the questions raised about the ERDA-UC relationship seem to be still reverberating in Congress, and to have given further added momentum to an already

*Initial members of the consortium where the University of New Mexico, New Mexico State University, Colorado State, University of Denver, University of Colorado, Brigham Young University, University of Wyoming, Utah State University, and University of Nebraska, Lincoln.

growing curiosity there about ERDA management of its laboratories.

ERDA, of course, inherited the weapons labs from the Atomic Energy Commission, which ERDA supplanted. Both Los Alamos and Livermore have done nonweapons research from their early days. The rationale for diversification was mixed. It was felt that a weapons lab operating in secrecy and giving no opportunities for staff members to publish or work with colleagues in the general scientific community would ultimately have a stultifying scientific atmosphere. The weapons labs also had strong technical manpower resources and, in some cases, unique equipment and facilities, and it seemed wasteful not to make them available for use in solving significant nonmilitary scientific problems.

Research horizons were broadened at the start of this decade when AEC legislation was amended to permit research on nonnuclear energy sources in AEC labs. With the coming of the oilshed year of 1973, energy R & D rose very rapidly (ERDA was created in 1974).

The total AEC operating budget at Los Alamos in 1973 was $107 million. It rose to an estimated $216 million this year. National security work was $77 million in 1973 and is an estimated $106 million this year. Federal-sponsored energy R & D went up from $14 million in 1973 to $85 million in the current year.

National security work has decreased from well over two-thirds of the AEC budget for Los Alamos in 1973 to well under half of the ERDA budget in fiscal year 1977. A similar pattern can be seen at Livermore although the percentage buildup of energy research has not been as great.

The legislation creating ERDA perpetuated the arrangement under which the civilian-controlled AEC shared responsibility for nuclear weapons development with the Department of Defense. ERDA, therefore, as one agency official put it, continues "to march to two different drummers." And Starbird, as assistant administrator for national security, is, in the opinion of knowledgeable observers, more equal than other assistant adminis-

Critics Seek "Conversion" of Labs

Controversy over University of California (UC) management of the Los Alamos and Livermore weapons laboratories first reached serious levels in the late 1960's in the atmosphere generated by anti-Vietnam war sentiment. The critics ranged from those who demanded an unconditional end to university involvement in nuclear weapons research to others who felt that the university should continue as contractor, but argued that the labs were operating virtually independently of the university and that UC should exert more effective supervision.

The criticism resulted in the appointment of a special faculty committee on academic research to consider the appropriateness of the relationship with the weapons labs. The committee, headed by Paul E. Zinner, chairman of the political science department of UC, Davis, recommended that the university should continue as contractor of the weapons laboratories if substantial modifications of the arrangement were made. The major general recommendations were that "the university should exercise leadership in the determination of the technical policies of the laboratories and should extend to them the processes of review, supervision, advice, and governance generally applicable on the campuses. The resources of the laboratories, in turn, should be made available to the academic community for teaching and research purposes to the fullest extent possible." If a workable integration plan were not achieved, the committee recommended that the contract be terminated.

The university regents considered the Zinner report in making their decision to approve renewal of the contract in 1972 and adopted some of the report's recommendations, most in modified form.

Last year, opposition to another renewal of the contract emerged principally in the form of the U.S. Nuclear Weapons Labs Conversion Project. This is a coalition formed around antiwar organizations, such as the War Resisters League in San Francisco, which has enlisted about 25 other groups, UC students, faculty, and staff.

The aim of the coalition was to open up the renewal process to public discussion and to push for inclusion of a clause in the contract to phase out nuclear weapons research and to convert the laboratory to alternative uses—primarily research on nonpolluting energy sources. The group also sought an independent review of safeguards on the use of plutonium at the laboratories.

The opposition movement started late and did not achieve support within the university matching the intensity that was generated in the late 1960's and led to the Zinner report. But these critics do claim, for example, that they helped to bring about the release of a study by a scientific advisory committee on Los Alamos and Livermore, done in 1974, in response to a recommendation of the Zinner committee. The report of the study group, which included several distinguished outsiders, indicated that the weapons laboratories had gone a considerable way in implementing some recommendations of the Zinner committee, particularly in respect to such matters as appointment procedures for lab directors and bringing policies affecting the laboratories' staff into conformity with those for university staff and faculty. But the committee's accounting gives the impression that no great progress had been made in extending strong university supervision to the lab operations.

This year, a coalition spokesman testified at a regents' subcommittee meeting on the contract renewal and UC president David Saxon said he would appoint an administration committee to "take a hard look" at the questions raised.

The opponents are continuing to seek wider public discussion of the issue. The subject was taken up recently at a meeting of the education subcommittee of the state assembly, and the committee is said to be gathering information on the matter with a view to considering it further. And the coalition plans to hold demonstrations at the end of April at Livermore to maintain public attention.

At this point, the regents show no sign of altering their long-held attitude that the university is performing a public service by operating the weapons labs and that it is in the best interests of the university to continue. But it seems equally clear that renewal of the contracts does not mean that the issue will necessarily be dormant for another 5 years.—J.W.

trators at ERDA, most noticeably where the weapons labs are concerned. Cited as an illustration was Starbird's recommendation accepted by then ERDA Administrator Robert C. Seamans, Jr., last summer that negotiations be opened on a noncompetitive basis for extension of the contracts.

Members of the consortium continued to get a sympathetic reception from officials on the civilian side of ERDA, and they interpreted this to mean that a proposal to take over management might be favorably received. At a meeting on 31 January, General Giller disabused them of any doubts about the views of the national security division on such proposals. Those who attended the meeting understood that Starbird's attitude was that rather than see the lab operated by another contractor, he would prefer that it be cut back to performing weapons work only.

According to ERDA officials, the ERDA view is based on a feeling that Los Alamos has operated successfully for a long time under UC management and there is no reason to change so long as the university is willing to continue. They say that ERDA procedures call for a move to "recompete" only when it is clearly to the advantage of the government. The officials say that among the advantages of the UC relationship is that the university has been willing to operate the lab "without great profit." (UC gets a management fee of something over $3 million a year for managing the laboratories.) The weapons labs have also been able to tap the resources of the universities to avoid the costs of crash programs at Los Alamos.

Observers say that the rapid buildup of energy research at the weapons labs has probably ended. The surge of energy R & D funding which occurred after the energy crisis of 1973–1974 came at time of a slump in funding of the weapons program so that the energy projects were welcomed by the national security side of ERDA. Now, say observers, Starbird and others are concerned that the proportion of energy R & D at the lab has grown too large. A new review process aimed at coordinating the military and civilian work of LASL and Livermore has been instituted. And ERDA officials say that the weapons labs are no longer getting energy projects as easily as they did.

A prime target of criticism from nongovernment researchers is the ERDA practice of assigning research projects to its laboratories† under the so-called "form 189" system. The name derives from the forms used by the labs in requesting permission and funding for R & D projects. The critics claim that ERDA labs have received preferential treatment from headquarters. They say that the decisions are made by a small group of ERDA officials who are not necessarily well qualified to judge particular projects and that there is no adequate peer review process or mechanism for evaluating the work done.

Behind the criticism is a feeling that ERDA has a policy of funneling R & D funds to its own labs at the expense of other research organizations, both public and private, which might be better qualified to perform particular projects.

The critics suggest that ERDA in managing energy research is perpetuating a system developed by the AEC for nuclear research in an era when such research was either classified on national security grounds or required knowledge or facilities often found only in federal laboratories. ERDA figures show that during the period of very rapid growth in federal energy research funds, a large number of projects did flow to federal labs. In fiscal year 1976, for example, of a total $2 billion in ERDA R & D funds, about $1.1 billion went to ERDA labs and plants and $867 million to outside contractors. But in 1977, of a total $2.9 billion, about $1.5 billion was earmarked for ERDA facilities and about $1.4 billion went elsewhere.

The trend, in other words may be away from in-house R & D. And there are signs that ERDA is taking a serious look at its policies. The form-189 system, for example, is said to be under review. And ERDA officials are actively seeking ways to make the best use of industry and universities and other nonprofit research competence in energy R & D.

ERDA's rationale for its initial heavy reliance on its own laboratories is indicated in a General Accounting Office report on management and funding aspects of three nonnuclear projects which was undertaken at the request of Senator Frank Church (D–Idaho), chairman of a Committee on Natural Resources and Energy subcommittee. GAO reported that ERDA officials said they made extensive use of the agency laboratories because of "their unique capabilities and experience," because of the labs' responsiveness to ERDA headquarters direction and control, because of the pressure of time in the emergency atmosphere of the energy crisis, and because of the laboratories' willingness to make substantial use of outside contractors. The subject is now undergoing more extensive examination by GAO and interest in Congress seems to be growing. The matter is a complex one, for what is involved is the perennial question about the federal laboratories in general—of how to sustain a national resource without fostering a system of closed-circuit science.

The now superseded Joint Committee on Atomic Energy in its latter years was not disposed to examine such questions closely. So it is not surprising that the weapons labs, which long led a sequestered existence, are now getting special attention.—JOHN WALSH

†ERDA operates eight major "multiprogram laboratories" in addition to nearly twoscore other plants and more specialized laboratories. The multiprogram labs are Los Alamos and Livermore, Argonne, Brookhaven, Lawrence Berkeley Laboratory, Oak Ridge, Pacific Northwest Laboratories, and Sandia Laboratories (a third weapons laboratory, which specializes in the "weaponization of nuclear ordnance," and has been operated for ERDA by Western Electric since 1949).

RECENT DEATHS

Douglas D. Bond, 65; former dean, Case Western Reserve School of Medicine; 30 October.

Rayman W. Bortner, 49; professor of human development, Pennsylvania State University; 30 October.

Edward A. Boyden, 90; former chairman of anatomy, University of Minnesota; 27 October.

John C. Cassel, 55; professor of epidemiology, School of Public Health, University of North Carolina, Chapel Hill; 24 October.

Donald S. Clark, 69; professor emeritus of metallurgy, California Institute of Technology; 2 October.

Alfred E. Emerson, 79; professor emeritus of zoology, University of Chicago; 3 October.

Herold C. Hunt, 74; professor emeritus of education, Harvard University; 17 October.

John E. Lauritzen, Jr., 50; physicist and senior scientist, Institute for Materials Research, National Bureau of Standards; 11 October.

Milton Levy, 73; former chairman biochemistry department, Dental School, New York University; 30 October.

Erratum: The salary figures quoted on page 281 in the 15 April story on Stevens Institute of Technology were for average compensation, plus countable fringe benefits, and should have been so identified.

Erratum: The picture of Paul Erdös that appeared on page 144 in the 8 April issue should be credited to J. A. Bondy at the University of Waterloo, Canada.

Erratum: Due to an editing error, the capacities of two nuclear plants were incorrectly described in the 25 March issue, p. 1312. The Millstone 1 plant has a capacity of 630, not 830 megawatts, and Millstone 3 will have a capacity of 1150, not 1000 megawatts.
—D.S.