

The University of California@150*

HISTORY'S COILS:
The UC Nuclear Weapons Laboratories**

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ABSTRACT

Early in the Second World War, Franklin Roosevelt appealed to the nation's elite universities to join in the quest for powerful new technological weapons to counter the Nazi threat. Urged on by Nobelist Ernest O. Lawrence, inventor of the cyclotron and director of the Berkeley Radiation Laboratory, the University of California responded to Roosevelt's call in 1943 by lending its scientific leadership to the Manhattan Project at Los Alamos, New Mexico. The goal: to design and build the world's first atomic bomb. UC president Robert Gordon Sproul intended from the outset that the University's involvement in secret weapons research would end with the conflict itself. In the end, an engagement entered into as an act of wartime service became a more or less permanent marriage that was controversial from the start. What justification could a public university—any university—offer for conducting research on weapons of mass destruction? Decades of public protest and faculty criticism did not end UC's involvement in the weapons laboratories it managed for the federal government, first at Los Alamos and later at Livermore, California. What almost did was a series of sensational events that began in 1999 with charges that a spy was at work in Los Alamos's X Division, responsible for the design of nuclear weapons. The ensuing espionage trial and its aftermath sent shock waves that spread far beyond the specific details of the case. They precipitated a series of events involving national security, US nuclear policy, and politics within the Department of Energy and the Congress that cast a shadow over UC's stewardship. The University and its president, Richard Atkinson (1995-2003), faced fundamental questions about the direction and future of an increasingly contentious partnership. This paper discusses the University's evolving relationship with the federal government and how the debate over the nuclear weapons laboratories ultimately shifted from morality to management.



Keywords: University of California, nuclear weapons research, university service, national interest

If we get rid of bomb making, plutonium, and New Mexico, I would be very happy.
UC President Robert Gordon Sproul, 1946

In the fall of 1998 Director John Browne of the Los Alamos National Laboratory (LANL) testified before a congressional committee worried about the safety of the nation's nuclear secrets. LANL and a second nuclear weapons research laboratory—the Lawrence Livermore National Laboratory, or LLNL—were both managed by the University of California for the US Department of Energy. Between them, these laboratories had invented every weapon in the nation's nuclear arsenal. Spies and nuclear weapons have a natural affinity for each other, and the backdrop of Browne's testimony was a fight simmering in Congress over the Clinton administration's decision in the early 1990s to ease some of the restrictions on visits from foreign scientists to American laboratories. Republicans were arguing that the Clinton directives amounted to an open invitation to espionage, especially by

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China. The end of nuclear testing in the early 1990s, as a result of the Comprehensive Test Ban Treaty, meant that the two UC weapons laboratories depended more heavily on high-performance computers and computer simulations to monitor the safety and reliability of the nation's nuclear stockpile. Computer security was therefore an especially sensitive issue; advances in computer technology were so rapid that keeping intruders out was an ever-mounting challenge. On a number of occasions, the General Accounting Office had criticized the nuclear weapons laboratories for being insufficiently strict about overseeing Chinese and Russian visitors to ensure they were barred from access to classified information.

Browne sought to reassure his listeners by explaining the security procedures at LANL: no foreign nationals were allowed access to classified information, and the laboratory had recently created a new counterintelligence office to monitor foreign visits. He described the scientific contributions of foreign scientists who came to the laboratories as postdoctoral students or as visitors, the range of expertise they brought to the American research enterprise, and the important international partnerships they helped nurture. He pointed to recent visits from Russian scientists who were working with LANL colleagues to ensure that the nuclear stockpiles of the former Soviet Union remained secure and out of the hands of rogue nations. It was in the nation's interest not to shut out foreign scientists because no laboratory can hope to remain at the top without playing an active role in the international scientific community. The degree of openness at Los Alamos, he insisted, was compatible with both good security and good science.

What Browne did not say in his public testimony—and could not say, under threat of penalty from the Federal Bureau of Investigation—was that he had known for a year that the DOE and the FBI suspected a spy was active in X Division, the unit responsible for Los Alamos's nuclear weapons designs. The FBI insisted that Browne neither remove the suspect—a nuclear scientist named Wen Ho Lee—from his sensitive position nor inform other UC officials, including the president of the University, about the FBI investigation. Atkinson learned about Wen Ho Lee a day or so before the *New York Times* ran a story in March 1999 about his dismissal from the laboratory for alleged security breaches.

Lee was not a foreign visitor but a long-term LANL employee, originally from Taiwan, who had become a naturalized American citizen. His work involved constructing computer codes that simulate what happens inside nuclear weapons—atomic bombs and hydrogen bombs—when they explode. He was, the *Times* reported, a “prime suspect” in an FBI investigation of alleged thefts of US nuclear secrets by China.² After his arrest in December 1999, Lee spent 278 days in prison, many of them in solitary confinement. The FBI's investigation, called *Kindred Spirit*, centered largely on circumstantial evidence and was flawed by a hasty and near-exclusive focus on Lee as the primary suspect. Presiding judge James Parker concluded that Lee's arrest and incarceration amounted to a major miscarriage of American justice. On September 13, 2000, Judge Parker told Lee he was a free man, adding that the government's actions “have embarrassed our entire nation and each of us who is a citizen of it.” In exchange for pleading guilty to one count of downloading classified information, Lee was sentenced to the 278 days in prison he had already served.

Whether or not Lee was a spy, he had in all likelihood committed the most serious security breach at the weapons laboratories in three decades. The circumstances of his case prompted a June 1999 report from the President's Foreign Intelligence Advisory Board, chaired by Senator Warren Rudman, that indicted the laboratories for a longstanding pattern of lapses in security, large and small, and the Department of Energy for arrogance, inertia, and bureaucratic stonewalling.³ Rudman's report bore the descriptive title “Science at Its Best, Security at Its Worst,” and it was careful to point out that his criticisms were not aimed at the science performed at the weapons laboratories, which were described as “national jewels.” It was the management issue that concerned Rudman and his colleagues, and their concerns ranged far beyond the specific details of the Lee incident and the Los Alamos laboratory. “The predominant attitude toward security and counterintelligence among many DOE and lab managers has ranged from half-hearted, grudging accommodation to smug disregard,” the report charged, leading to “substantial” opportunities for the loss of sensitive information.⁴ The most withering blasts were directed to DOE, but there was plenty of criticism for the weapons laboratories as well, reinforcing an image of sievelike laxity about the nation's nuclear secrets.

The Lee case opened the door to the idea that the University of California, despite the laboratories' brilliant accomplishments in nuclear physics and a host of other disciplines, was not the only—perhaps not even the best—possible manager of Los Alamos and Livermore. UC had run them, without competition, for almost sixty years. Even before the Lee incident, the Department of Energy had begun dropping hints to UC officials that it might consider opening the laboratory management contracts to other competitors. A non-UC manager for the third DOE laboratory run by the University, the Lawrence Berkeley National Laboratory (LBNL), was unlikely; LBNL, which conducts unclassified energy-related research, had been located on the UC Berkeley campus since its establishment in the 1930s and many of its scientists were also Berkeley faculty. But the weapons laboratories were separate institutions, and Los Alamos, located high in New Mexico's Jemez Mountains, was not even in California.

The spy scandal and the publicity surrounding it set off an alignment of powerful forces that undermined the case for UC's management: hostile elements in DOE, political agendas in Congress and the Bill Clinton and George W. Bush administrations, even the continuing fallout from the geopolitical realignment ushered in by the end of the cold war. What happened was also the culmination of a sea change in UC's relations with Department of Energy and sixty years of conflict over the morality and the management of research on weapons of mass destruction.

1. SECURITY

The immediate result was a new and stricter regime of DOE-mandated security measures at the national laboratories. At the same time, DOE commissioned an investigation of the Lee case and security at Los Alamos by the Inspector General. While noting the recent improvements Secretary of Energy Bill Richardson had mandated, the Inspector General's report revealed a DOE riddled with systemic problems in dealing with counterintelligence issues and hobbled by widespread confusion about individual roles and responsibilities in various aspects of the Lee case. Communications within DOE, and among DOE, the FBI, and the laboratory, were muddled by conflicting versions of the same events, misunderstandings, poor judgments, and inadequate or non-existent follow-up. This account reflected a reality the University and the laboratory had already learned the hard way: the division of authority for security between DOE and the UC laboratories, including the highly sensitive area of cybersecurity, was ambiguous at best. Under its contracts with DOE, UC was responsible for complying with DOE security regulations and directives. But how was the University to carry out its responsibilities when—as in the case of Wen Ho Lee—only one UC person (in this instance, the LANL director) was permitted to know about the potential security breach? Although blame was difficult to assign in this murky managerial environment, the Inspector General identified nineteen individuals at DOE and LANL with “a degree of responsibility” for the fiasco. Richardson, frustrated that “the factual record isn't clearer about who knew what when,” wanted the University to discipline three of them.⁵

Richardson, whose handling of the Lee case may or may not have been influenced by his rumored aspiration to be Al Gore's running mate in the 2000 election, had a list of LANL employees that he wanted Browne to fire. One of them was a former LANL director, Siegfried Hecker. When Browne refused, Richardson proposed that they meet for breakfast at a restaurant in Santa Fe to discuss it. Browne arrived first. Before long Richardson appeared, trailing an entourage of television and print reporters, and proceeded to demand on camera that Browne fire the offending employees. Browne refused.⁶

The following month, DOE awarded LANL a satisfactory rating—the highest possible—on security and noted that the Livermore laboratory was much improved and on the way to a satisfactory rating as well. “Our reforms are beginning to work,” Secretary Richardson declared. These reforms had included greater restrictions on foreign visitors and, to snare potential spies at the outset, the extension of polygraph testing to thousands of laboratory employees. Atkinson was alarmed by the chilling effect these steps could have on morale and the quality of science performed at the laboratories, and he was not alone. The National Academy of Sciences warned against “potentially inappropriate restrictions” on foreign visitors and the damage such restrictions would inflict on America's scientific and security interests alike. Atkinson's principal advisory group for the laboratories, the UC President's Council on the National Laboratories, echoed the Academy's concerns in a November 1999 report that also cut through the ambiguity of the overlapping roles of DOE, and FBI, and UC in security matters. It asserted that UC must assume full responsibility for safeguarding nuclear secrets, devoting as much attention to security as it did to physical safety and environmental protection at the laboratories.

The report endorsed many of the steps DOE had already taken but disputed allegations that the laboratories had neglected or downplayed security. Richardson had written Atkinson the previous summer demanding assurance that the University was fully committed to implementing DOE's “full range of counter intelligence activities and the use of polygraph testing.”⁷ The UC President's Council took a tactful but firm position on that issue. Polygraph testing, the report said, often yields false positives and is most useful as an investigative tool in specific cases and as a deterrent to security leaks to foreign nationals. Its widespread use, however, would undermine morale at the laboratories and discourage talented scientists and engineers from joining them.

A new security issue cropped up at Los Alamos the following spring. On June 1, 2000, lab officials learned that two computer hard drives with classified information had gone missing. The hard drives had disappeared sometime during the two-week period in which the Cerro Grande wildfire (a huge conflagration that burned through 43,000 acres in Northern New Mexico, including 7,500 acres of LANL) forced the closure of the laboratory. This security mishap had potentially serious implications: the hard drives were part of a nuclear emergency tool kit and contained information that could be useful to existing or emerging nuclear powers. On June 16 the drives were discovered behind a copy machine, undamaged and apparently untouched. Richardson, criticized for not reporting the incident immediately to Congress, appointed a DOE panel to “address the serious shortcomings of the University of California contractor at our weapons laboratories.”⁸ A subsequent DOE proposal to relieve UC entirely of its security responsibilities at Los Alamos and Livermore got no support in Congress. But the University's argument that science and security were compatible, and that UC could handle both equally well, was being met with increasing skepticism.

2. MORE MANAGEMENT ISSUES

By summer 2002 rumors had begun to surface about business operations at Los Alamos, specifically its procurement practices. An Albuquerque reporter claimed he had received an anonymous thirty-pound box of laboratory documents that were said to reveal a variety of unauthorized charges, misuse of the lab-issued purchase cards, and other illegitimate business practices at the laboratory. In August the University engaged John Layton, a former DOE and Department of the Treasury Inspector General, to conduct an independent review of the purchase card system and LANL business practices generally.

The growing problems at Los Alamos prompted Atkinson to send a special review team there in November 2002, headed by Senior Vice President Bruce Darling. During lunch on the first day, the members of the review team learned that LANL management had fired two employees—potential whistle blowers who had recently been in touch with Department of Energy about alleged irregularities in the laboratory's business practices. It was an inauspicious beginning to a visit that also turned up evidence of lax controls over purchasing and a backlog of more than 250 audit recommendations that management had not acted on. After a second visit in December, the team concluded that "sweeping changes" were needed in the Los Alamos administration. Director Browne resigned at the end of that month. Seventeen LANL employees were fired, removed from management positions, or reassigned. Atkinson appointed a new director, retired vice admiral George P. Nanos, on January 2, 2003.

The administrative and business problems at Los Alamos were real, but their fiscal consequences were far less than they first appeared and were later portrayed in the press. Twelve months of audits covering 170,000 separate transactions stretching back over almost four years uncovered a few instances of employee fraud, a handful of purchases that were clearly unorthodox, and a certain degree of carelessness about business controls. In a purchasing budget of \$120 million, the auditors found \$3,000 in fraudulent purchases and \$320,000 worth of costs that might not be allowed under DOE contract guidelines.⁹ During the Cerro Grande wildfire, for example, laboratory funds paid for camping equipment, dog food, and a pair of oars. The dog food might have been for animals used in fighting the fire, but the camping supplies and the oars were harder to explain.

The strangest example—the one that became the bumper-sticker for allegations of corrupt business practices at Los Alamos—was the Mustang incident, which illustrated both the importance and the impossibility of managing public perceptions of events at the laboratory. The media version was that an LANL employee had attempted to buy a customized black Mustang GT convertible with her laboratory purchase card. In reality she had placed an order for some laboratory equipment over the telephone without realizing the number she dialed, which had belonged to the laboratory's regular supplier, was now being used by an enterprising car salesman with a history of unorthodox business practices. He took advantage of her mistake to bill the laboratory \$30,000 for a Mustang. No money, and no Mustang, ever changed hands. The University ultimately concluded that the employee and the laboratory were the innocent victims of a fraud rather than its perpetrators. But UC was prohibited from doing an investigation until the FBI finished its own inquiry, and by that time it was far too late for the facts to catch up with the story.

In a less frantic political environment, the administrative stumbles at Los Alamos might have been considered more akin to a wake-up call than a crisis. UC auditor Pat Reed used a different metaphor. The barn door had been left open, he concluded, but it was a tribute to the people employed by the laboratory that by and large the horses were still inside.

The University's response to criticism of its management did not end with the audits. Atkinson approved a major revamping of the University's oversight mechanisms for the laboratories in spring 2003. The President's Council had devoted most of its attention to overseeing the quality and performance of the laboratories' scientific programs. The changes included a new external governance board and much broader internal oversight that incorporated UC's audit, business and finance, legal, and human resources expertise.

UC won some of the battles over the laboratory. The Los Alamos contract was not terminated early, ahead of its 2005 expiration date, as some members of Congress were demanding. But it became clear that UC had lost the competition issue when, at a celebration of LANL's sixtieth anniversary in April 2003, one of its staunchest friends announced he was endorsing an open competition for the 2005 Los Alamos contract. Senator Pete Domenici (R-NM) left no doubt about his position: "The evidence is clear that the Laboratory has not been managed well, particularly in the area of business systems," he said, adding that the time had come for the application of "tough love." Domenici's withdrawal of support made contract competition inevitable. It was an especially painful defeat because Domenici had been a champion of UC management through many public controversies and political storms.

DOE's Undersecretary of Energy, Linton Brooks, told the Regents in May 2003 that he had reviewed events at Los Alamos for Secretary Spencer Abraham, Richardson's successor. Brooks's conclusion was that DOE and the University shared responsibility for the shortcomings that had developed at the laboratory. Once those shortcomings surfaced, however, he considered the University's actions "broad, forceful, and effective. . . . It is difficult to see how any organization could have done more to deal with

the problem than the University of California did.”¹⁰ His review, moreover, found that the quality of LANL’s science was unaffected by the administrative missteps that led to DOE’s decision to open the contract to competition.

There had been occasional murmurings of discontent about the University’s management of the three DOE laboratories in earlier years, but in each case the threat of competition had not materialized. President David Gardner, on learning that DOE had plans to put the laboratory contracts up for competition in 1992, told Secretary of Energy James Watkins the University would not seek to win them; its stewardship of the laboratories was a public service undertaken at the request of the federal government. The Regents supported Gardner’s decision.¹¹ DOE did not put the contracts out to bid.

The University of California had maintained for six decades that it managed the federal laboratories only as a public service. Did this preclude competition? In facing this question, Atkinson had no formal policy to guide him. What he and the Regents did have was sixty years of history.

3. AN EVOLVING RELATIONSHIP

When UC President Robert Gordon Sproul and the Regents agreed in to contract with the US government to lead the Manhattan Project in 1943, wartime secrecy meant they were told little about what it was supposed to do (Sproul once publicly speculated it was perhaps to devise “a death ray”). He considered it a necessary, if temporary, contribution to victory by the US and its allies. When Sproul reluctantly agreed to extend the wartime research contracts for five years in 1947, he made their provisional character clear: “My final word was, ‘we are now engaged, but the banns are not to be published until each party has had an opportunity to investigate the background and intentions of the other more thoroughly.’” Yet there was to be nothing temporary about the University of California’s involvement with nuclear weapons research. The Army prevailed upon the University to continue its stewardship of Los Alamos until Congress passed legislation to create the Atomic Energy Commission, which would assume civilian responsibility for all nuclear matters on behalf of the federal government.

By the time the legislation passed several years later, the cold war had already begun, and Sproul and the Regents were persuaded to continue managing Los Alamos by Professor Ernest O. Lawrence, inventor of the cyclotron and UC’s first Nobel Prize winner. The University ultimately agreed not only to run Los Alamos but also to establish a branch of Lawrence’s Radiation Laboratory in 1952 to conduct nuclear research at Livermore, about thirty-five miles east of Berkeley. The Lawrence Livermore National Laboratory was a response to the Korean War and the Soviet Union’s testing of a hydrogen bomb. In the postwar world, dominated by apocalyptic fears of nuclear catastrophe and a national policy of mutually assured destruction, the argument for two nuclear weapons laboratories rested on the logic of competition: Los Alamos and Livermore would ensure American nuclear dominance over the Soviet Union by vying with each other for the best people and the best programs.

The scientists and engineers who built the nation’s nuclear arsenal thought of themselves not as “contractors”—the Department of Energy’s term for the laboratories—but as the last line of defense for the U.S. and democracies everywhere. This perspective endured long after the Manhattan Project ended. In the 1980s a visiting auditor asked a Livermore nuclear weapons physicist for a description of the laboratory’s customers. “The Free World!” was the reply. And consistent with this expansive view of the laboratories’ mission, for at least three decades after the end of World War II the relationship between the University and the DOE was predicated on the idea of mutuality—a postwar partnership uniting national security and big science. The federal government, through DOE, defined the laboratories’ priorities and programs and provided their budget. The University’s responsibility was to produce outstanding scientific programs, monitored through rigorous peer review, principally but not entirely in the area of nuclear weapons.

“Mutuality” implied several things. Laboratory employees were UC employees and could not be fired by the Department of Energy. As long as the laboratories met the goals established by DOE, they had broad flexibility with regard to how to go about it; differences would be settled through discussion and agreement, including differences over the uncertain costs of producing cutting-edge science. All three DOE laboratories—the non-weapons Berkeley laboratory as well as Los Alamos and Livermore—regularly took on unprecedented scientific challenges, creating technologies and building machines no one had ever attempted before.¹² The University received a modest fixed payment for the costs it incurred in running the laboratories. This last point was a highly symbolic declaration of independence: DOE might consider UC a government contractor, but the University saw itself as performing a public service.

There were disputes and power struggles between UC and the huge DOE bureaucracy, an early example of which was the federal government’s imperious appointment of LANL’s first postwar director without consulting the University at all. But in the era of mutuality, the balance of power was largely on the University’s side. The laboratories were the single most important barrier between the nation and the threat of nuclear conflict in a dangerous world. Laboratory directors were respected in Washington

and listened to when they testified about nuclear weapons and national security before congressional committees. Friends and defenders in Congress saw that money flowed to the weapons laboratories, and money meant independence.

From the beginning, however, there were those who were troubled by an ethical question—the apparent contradiction between traditional academic openness and secret research on weapons of mass destruction. Justifying this seeming paradox was to be one of the larger challenges of managing the laboratories. The administrations of David Saxon (1975-83) and David Gardner (1983-1992) were marked by recurring protests, public demonstrations, political controversy, and faculty admonitions to exercise stronger administrative oversight of the laboratories.

Both Saxon and Gardner defended the University's involvement with the laboratories by an appeal to principle. It was the job of the US president and the Congress to decide whether the design and development of nuclear weapons were essential to the defense of the United States. With that assumption, the University had two important contributions to make. First, UC could ensure the laboratories' scientific independence and intellectual freedom and offer the Congress and the president of the United States unbiased advice on vital nuclear issues. Second, as long as the federal government's policy was to build and maintain nuclear weapons in the national defense, the University of California rendered an important public service in managing the laboratories at Los Alamos and Livermore.

The question this rationale left unanswered was exactly how the weapons laboratories fit within the larger organization of UC as an academic institution. The University had accepted more or less permanent responsibility for two organizations that were direct instruments of national policy. They served multiple masters—Congress and the Department of Energy as well as the University—and were highly vulnerable to shifts in the political landscape. And like other complex organizations, over time the weapons laboratories developed their own culture and inner logic, their own trajectory of growth, and their own pattern of responding to pressures from within and without. The University's managerial role was an accident of history, but like many such accidents it had unforeseen consequences and ramifications.

It was the faculty who, through the Academic Senate, periodically raised the question of the ethics of UC's involvement with nuclear weapons. The first of a series of Academic Senate reports on the subject—the 1970 Zinner report, named after the committee chair, UC Davis professor of political science Paul Zinner—laid out with remarkable clarity the major reservations about UC's nuclear connection that were to surface again and again over the next forty years. Mixing sober analysis with the heady moral rhetoric of the Vietnam era, Zinner and his colleagues argued that making sense of UC's relationship with all three of its national laboratories would require the University to define its role in the new era of big science, when it would be called upon to help society adapt to the enormous changes—overpopulation and environmental pollution among them—created by scientific progress of all kinds. Their complaint was that the laboratories were not being used to their full potential or sufficiently connected to the campuses.

All but one member of the Zinner committee agreed that the University's relationship with Los Alamos and Livermore was “in principle not inappropriate” while at the same time leaving “much to be desired in practice.” But it offered a stern assessment of the University's management, describing it as “nominal,” the President's Office as adopting a “hands-off policy,” the role of the Board of Regents as “largely ornamental,” and the University itself as a “benevolent absentee landlord. . . . The laboratories, therefore, exist in a world of their own, isolated from the academic community of the University and to some extent from each other as well.”¹³

Given the portentous tone of the discussion, the report's recommendations to improve the University's management were for the most part surprisingly modest.¹⁴ Two dealt with the status of the Livermore laboratory. The committee argued for severing the administrative relationship between Berkeley and Livermore, making the Livermore laboratory independent—which the Regents ultimately did—and for considering, at some unspecified future date, the option of transforming Livermore into a UC campus.

Nothing came of this last recommendation, but it touched on a central issue nonetheless: the anomalous organizational status of the laboratories within the University of California. The Zinner committee saw them as annexed to the larger institution but unincorporated, neither truly part of it nor entirely separate but suspended somewhere on the periphery. UC's oversight was too episodic and haphazard, and the University itself followed the government's nuclear weapons policy without voicing the objections it was an academic institution's obligation to make. The proportion of nuclear weapons research should decline, Zinner and his colleagues argued, to be replaced by research on pressing national problems like the environment, energy, and disease. Finally, UC's institutional involvement in nuclear weapons should continue only if oversight were strengthened and expanded. The Regents agreed with this recommendation and appointed two advisory committees, one for the weapons laboratories and one for the Berkeley lab, with “experience relevant to the Laboratories' programs” to advise the laboratory directors and the president on the breadth and quality of the laboratories' research.¹⁵

The straight line leading from morality to management was the Zinner report's solution to the contradiction between the university's role as an academic institution and its role as a contractor for laboratories devoted to the design of nuclear weapons. It was the integrity and rigor of UC's stewardship that removed the moral taint of involvement with these weapons: "We consider the University's failure to assume leadership over [the laboratories], shape their policies, guide their development and tap their resources more troubling than either the actual or the fancied liabilities incurred by sponsorship of nuclear weapons research." Zinner and his colleagues recognized their recommendations would pose organizational challenges. "The laboratories are too big to be treated as ordinary organized research units located on the campuses," the report concluded. "They are veritable campuses in their own right. Yet they lack the essential attributes of a campus."

The committee's call for closer ties between the laboratories and the University was therefore easier to prescribe than to accomplish. The classified nature of most work conducted at the laboratories was and is a major obstacle in and of itself. The mission-oriented character of research at the weapons laboratories, even unclassified research, means that their budgets and their programs are enmeshed in the constantly changing politics of the Congress and the administrative bureaucracy of the Department of Energy. It was virtually impossible for any UC president, including physicist David Saxon, to understand the laboratories as well or as deeply as he understood the campuses. There were times when this fact gave them an autonomy the campuses did not have.

Nuclear weapons research drew demonstrations and other forms of public opposition for decades. Organized groups of citizens and students made effective use of these controversies to push their case for converting or closing the laboratories. Clashes involving Los Alamos or Livermore were even more likely than campus imbroglios to be trumpeted by the national media and amplified by national politics, drawing the president or the Regents into the line of fire.

Security, mission, and institutional culture all pointed up the difficulty of seeing the laboratories as proto-campus. The idea that there was an organizational and management solution to the moral issue of managing weapons laboratories held an enduring appeal nonetheless. Of the various faculty reports on UC's management, only one—a 1989 report by a committee headed by Professor Malcolm Jendresen of UC San Francisco—called on the University to withdraw entirely from work on nuclear weapons and the laboratories that produced them. The others consistently echoed the essential message of the Zinner report: more oversight, more opportunities for faculty and graduate students to engage in research at the laboratories, closer scrutiny by the Office of the President and the Regents. The years since Zinner and his colleagues rebuked the University as an absentee landlord have been marked by successive UC attempts at more, and more sophisticated, oversight of the DOE laboratories.

4. PERFORMANCE-BASED MANAGEMENT

While the forces behind the Zinner committee were nuclear protest and faculty qualms about involvement in nuclear weapons, most of the later oversight changes were driven by a very different force: the US Department of Energy. In the 1980s, waning cold war tensions brought a sharper focus on environmental issues at all DOE laboratories. Secretary of Energy James D. Watkins, appointed in 1989 by President George H. W. Bush, was determined to bring a stricter and more disciplined spirit to DOE's relations with its contractors. The secretary, whose uninhibited vigor in expressing his views had earned him the nickname "Radio Free Watkins," sent in teams of outside contractors, called Tiger Teams, to report on ES&H—environmental safety and health—procedures at all DOE facilities.

The three UC-managed laboratories found the Tiger Teams imperious and punitive in their approach. The 1990-91 DOE inspection at the Lawrence Berkeley Laboratory lasted five weeks, involved sixty-one Tiger Team members, and resulted in a seven-hundred-page report. It turned up no serious ES&H violations but left the laboratory with much remaining work to comply with regulations.¹⁶ A 1995 government report subsequently found that "The degree to which the government is specifying how these [ES&H] issues are to be handled is beginning to absorb virtually as much funds as funds remaining for science."¹⁷

The Tiger Teams represented a disturbing new venture into micromanagement by DOE. The agency was also contemplating the introduction of an "incentivization process" into its contracts as a way of gaining more direct control over laboratories' operations; in other words, DOE wanted to pay a larger fee to gain leverage over UC and other contractors. This concept was at odds with the idea of laboratory management as a public service. On the contrary, as the Regents were told in May 1991, it "characterizes a defense contractor relationship but does not describe the University's traditional relationship with the government in its management of the laboratories."¹⁸

It was becoming increasingly difficult to call on powerful allies in Congress to serve as a buffer between the University and DOE's more burdensome micromanagement. DOE was starting to renegotiate contracts in a way that required all of its national laboratories to shoulder more financial risk.¹⁹ DOE also made it clear to the University that it would need to know what

management improvements UC planned to make before it could make its own decision about whether to open the 1992 contracts to other competitors.

The University wanted to shift the conversation to outcomes, not procedures and regulations. UC senior vice president for administration Ronald Brady, the chief negotiator for the 1992 contracts, describes this position in his 1998 oral history: "We don't decide to build nuclear weapons. They [the Department of Defense] decide to build nuclear weapons, OK. Now, there comes a point when the scientists say, "OK, DOE, you said you want the following weapons built, now get out of our hair and we'll build them for you." And DOE says, "Oh, no. We want to task you. We want to tell Professor X (called Scientist X in the laboratories, but they're just like professors) to do the following things on Monday, and the next things on Tuesday, and the following things on Wednesday." And our position is 'Not us. That's not the way we do business.'"

The administration's strategy was to give DOE and the critics what they claimed to want: more oversight and accountability on the part of the University. Gardner disbanded the small advisory committees for the laboratories in favor of a much larger and more comprehensive oversight body, the UC President's Council on the National Laboratories, composed of distinguished representatives drawn from the faculty, the Regents' oversight committee, the Office of the President, government, and private industry. Its job was to advise the president and the laboratory directors not just on the quality of science at the labs, but on all aspects of their operation and management, reporting annually to the president and the Regents.

The heart of the University's new approach was measuring performance—establishing a set of standards that would provide objective metrics of its major activities, from designing nuclear weapons to enforcing safety procedures. The existing management fee would be replaced by a larger one based on how well UC met the criteria and taking into account the greater level of risk UC was accepting under the new arrangements. UC would define the operational standards by which it would be judged, but the President's Council and DOE would have to agree. And so performance-based management was born.

The University administration was specific about the principles guiding its negotiations. Three spoke directly to its history as a contractor: the principle of mutuality—"a key element of the philosophy underlying the contract being negotiated"; the no gain/no loss philosophy; and the academic atmosphere at the laboratories—the intellectual and scientific freedom of laboratory employees, including the ability of the directors and other officials to offer independent advice to the Congress and US president. This was a capsule description of the spirit of partnership with the federal government in the early days, a relationship that had long since begun to fray. Although Gardner told the Regents that the goal of the negotiations would be "to preserve the principle of mutuality on which the contracts have been based for nearly fifty years," the University's move to performance-based management was a tacit admission that the era of mutuality was over.²⁰

5. A NEW WORLD

Looking back, Gardner felt laboratory issues absorbed a disproportionate amount of time and energy during his administration.²¹ They were soaking up even more during the Atkinson administration. The 1992 contracts had only limited effect on righting what UC saw as a growing imbalance in its relationship with DOE. Performance-based management gave UC useful feedback on its stewardship, but in practice DOE often ignored any evaluation of University performance other than its own. The new regime was not inexpensive: laboratory administration in the Office of the President, which had been overseen by one scientist-manager assisted by a secretary, now employed more than twenty people. The turmoil that began with the Lee case piled on even greater expenditures of administrative time and effort; UC Auditor Pat Reed alone had made forty-two visits to Los Alamos in a single year.

For an allegedly absentee landlord, the University was investing enormous effort in the job.²² Probably no other University obligation had attracted more trouble, toil, and controversy. Was competition worth it? "One does not compete to perform a public service . . .," a UC official in laboratory administration had written in 1991. "[I]f the client thinks it can do better, it should by all means do so."²³ Further, after the April 2003 decision to open the contract to competition, DOE made it clear that future contracts would not be like those of the past. Any future manager of Los Alamos or Livermore would have to come to the table with a partner to run the business side of the laboratories. The management fee was increased accordingly to attract private-sector firms. DOE intended to award the contracts without discussion or negotiation with any of the competitors—a rejection of the principle of mutuality. On the other side of the question were, first, the reluctance to walk away from an enterprise into which the University had poured increasing amounts of time and attention; the blow to institutional prestige that could be involved in public perceptions that UC had "lost" the laboratories; and the conviction that managing the laboratories was an important act of national public service.

The decision to compete for the Los Alamos and Livermore contracts was made during the administration of Atkinson's successor, Robert C. Dynes, in 2005. UC's bid included three private partners, Bechtel National, Babcock and Wilcox Technical Services Group, and Washington Group International, responsible for managing the business side of the laboratories. In 2004 the Academic

Senate conducted a poll to determine faculty sentiment about whether UC should continue to manage the weapons laboratories. In striking contrast to a similar poll in 1990, this time the faculty endorsed UC's involvement by a three-to-one margin, although only about a quarter of the faculty supported sharing management responsibility with an industrial business partner.²⁴ The principal reasons supporters gave for their vote were the opportunities the laboratories offered for collaborative research between laboratory scientists and campus faculty and graduate and postdoctoral students; the high quality of the laboratories' unclassified research; and the view—held by nearly two-thirds of those responding—that UC's management was a “historic public service to the nation.”²⁵

Against huge odds and most expectations, UC and its partners were awarded the contracts for the weapons laboratories.²⁶ DOE's decision was an unexpected victory and a vindication of the scientific excellence UC management, for all its recent difficulties, had brought to the laboratories.

Among the wider currents that shaped the crisis over the weapons laboratories was a long-standing dissatisfaction in Congress with the Department of Energy, which made UC's management stumbles seem part of a larger problem. UC was not alone in dealing with an overly directive DOE. In 1995 the Task Force on Alternative Futures for the Department of Energy National Laboratories summarized DOE's management philosophy for all the laboratories under its purview: “The laboratories are purported to be contractor operated. The system is titled Government-owned, Contractor-Operated or GOCO. The GOCO system was a promising concept. . . . [But] [n]umerous instances of poor DOE regulatory and management practices have come to the attention of all members of the Task Force during its investigation of the national laboratories. The system has been tried long enough; the evidence is in. Today, the system has evolved to a virtual GOGO—Government Owned, Government Operated, but certainly strongly government-dominated system.”²⁷

In addition, the security controversy occurred at a time of transition in US security policy in the new international landscape of the post-cold war world. The laboratories, as Atkinson pointed out, did not set security policy or their own security budgets, and some of the University's requests for funds to strengthen security measures at the labs had been turned down by DOE. The persistent negative publicity surrounding the issue eclipsed the University's really important contribution to national security, the superb science the laboratories produced. Some UC officials regard the proliferation of security regulations at Los Alamos and Livermore, as a result of the Lee case and the hard drive incident, as an expensive impediment to that science, one which does not yield a compensatory benefit in safeguarding nuclear secrets.

In the broadest sense, the University's difficulties were a reflection of the changed status of nuclear weapons in the new world order. The days when the laboratories were seen as the most important arsenal of democracy faded with the cold war. And in terms of perceptions and their influence, a major question is whether the laboratories will continue to be seen as places where the UC traditions of public service and scientific independence play a dominant role. The division of laboratory management into a scientific side, managed by the University, and a business side, run by private-sector corporate partners, is the most profound organizational challenge UC has ever faced in its stewardship of the laboratories.

It is important to get the relationship right because the laboratories' extraordinary scientific capabilities matter for national security and much else. Los Alamos devotes more attention to experimental science, Livermore to modeling and computer simulation; both laboratories, however, cover the full spectrum of science, from basic research to applied technology. Long before the official end of the cold war, laboratory scientists were working on the national security implications of terrorism, biological and chemical weapons, and nuclear proliferation. Los Alamos trains nuclear weapons inspectors for the International Atomic Energy Agency. Livermore leads the world in computer modeling of climate and climate change.

Today the conflicts over UC's participation in nuclear weapons research have become fewer and far less vocal. The marriage that Sproul never wanted to happen remains. So do the tensions between morality and management first raised by the Zinner committee. As a 1990 report from the president's advisory committee on the laboratories pointed out, “The University's role is . . . an outgrowth of history and not something that we believe the University would be likely to enter into *ab initio* today. Management of a laboratory predominantly devoted to the design of nuclear weapons is not a ‘normal’ activity for a university.”²⁸ In May 2003 Atkinson testified before the House subcommittee on oversight and investigations about UC's partnership with the federal government. Like several UC presidents before him, he recalled the University's long history with the laboratories, the demise of the era of mutuality, the divisive controversies, and the commitment to science the University of California had brought to its many years of stewardship. “We've carried a heavy burden in running these laboratories,” he concluded. “We've done it as a matter of national service.”

ENDNOTES

¹ Testimony of John C. Browne at the Hearing of the Subcommittee on Military Procurement of the Committee on National Security, United States House of Representatives, October 6, 1998.

² "U.S. Fires Scientist Suspected of Giving China Bomb Data," *New York Times*, March 9, 1999.

³ "Science at Its Best, Security at Its Worst, A Report on Security Problems at the US Department of Energy," President's Foreign Intelligence Advisory Board (Senator Warren Rudman, Chair), June 1999. The Rudman report recommended insulating the weapons laboratories from a dysfunctional DOE by carving out a separate management entity for them called the National Nuclear Security Administration (NNSA), with responsibility for America's nuclear weapons, nuclear proliferation, and naval reactors. DOE secretary Bill Richardson successfully opposed making the NNSA an entirely independent agency; it remains within DOE. Available at <https://www.energy.gov/sites/prod/files/cioprod/documents/pfiab-doe.pdf>.

⁴ Rudman, 2.

⁵ "Richardson Announces Results of Inquiries Related to Espionage Investigation," Department of Energy press release, August 12, 1999.

⁶ The stalemate was resolved when Atkinson appointed an independent panel to advise him on appropriate disciplinary action for the three UC individuals cited in the Inspector General's report. The panel was not convinced that the employees in question were guilty of serious dereliction and recommended fairly mild penalties. The disciplinary action Atkinson imposed, which ranged from formal letters of reprimand to restrictions on employment or job assignment, were in each case more severe than those the panel suggested.

⁷ Letter from The Honorable Bill Richardson to President Richard C. Atkinson, July 30, 1999.

⁸ "Secretary Richardson Announces Changes with University of California Contract," Department of Energy press release, June 30, 2000.

⁹ "Update on Los Alamos National Laboratory," Senior Vice President, University Affairs and Interim Vice President, Laboratory Management Bruce B. Darling, Regents' Meeting, April 3, 2003.

¹⁰ Minutes of the Committee on Oversight of the Department of Energy Laboratories, Regents' meeting, May 15, 2003.

¹¹ The chair of the Committee on Oversight, Regent Dean Watkins, made a statement for the record at the board's June 1991 meeting:

The Regents welcome the report of the President concerning negotiations between the U.S. Department of Energy and the University of California regarding UC's management of DOE laboratories and affirm the Board's earlier stated intention to renew the management contracts if mutually agreeable terms can be negotiated. The Regents also endorse the stated position of the President that such negotiations be actively pursued once the DOE decides to extend the contracts rather than to award them by competitive bidding. This statement was the closest the Regents had ever come to a formal policy position on whether the University would compete to manage the laboratories.

¹² The Lawrence Berkeley National Laboratory was not designated as an unclassified laboratory until the early 1980s. During the Second World War it was deeply involved in nuclear research and production to support the war effort.

¹³ "Report of the Special Committee on University Research at Livermore and Los Alamos" (Zinner report), University of California Academic Senate, 1970, 12. In his autobiography, Wen Ho Lee echoes this sentiment: "Even today, the University of California is the employer of record at the lab, not the DOE or the government, but the university acts more like an absentee landlord." Lee, p. 92.

¹⁴ In addition to the two relating to Livermore, the principal recommendations were: Directors and their principal staff should be regularly included in Regents' meetings and meeting with the president and the chancellors; the laboratories should prepare annual development plans; like organized research units throughout the University, their missions should be reviewed every five years by a faculty committee; employees should enjoy the same advantages as any University employees; and an easing of classification and security procedures should be combined with an increase in graduate training.

¹⁵ "Response by The Regents to the Recommendations of the Academic Senate's Special Committee on University Research at Livermore and Los Alamos ("Zinner Committee"), Regents' Committee on Special Research Projects, April 15, 1971.

¹⁶ Minutes of the Committee on Oversight of the Department of Energy Laboratories, March 14, 1991.

¹⁷ "Alternative Futures for the Department of Energy Laboratories," Secretary of Energy Advisory Board Task Force on Alternative Futures for the Department of Energy National Laboratories, February 1995, A-3. The report, chaired by Robert Galvin, chairman of Motorola, Inc., is available at <http://www.lbl.gov/LBL-PID/Galvin-Report/Galvin-Report.html>.

¹⁸ Minutes of the meeting of the Regents' Committee on Oversight of the Department of Energy Laboratories, May 16, 1991.

¹⁹ There are eleven multi-program Department of Energy National Laboratories: Brookhaven National Laboratory (New York), Argonne National Laboratory (Illinois), Oak Ridge National Laboratory (Tennessee), National Renewable Energy Laboratory (Colorado), Los Alamos National Laboratory and Sandia National Laboratory (both in New Mexico), Idaho National Engineering Laboratory, Pacific Northwest Laboratory (Washington), Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, and SLAC National Accelerator Laboratory (all three in California). Nuclear weapons design and testing are done at Los Alamos and Livermore; weapons electronics are designed and built at Sandia.

²⁰ Quotation is from the minutes of the Regents' Committee on Oversight of the Department of Energy Laboratories, September 20, 1990.

²¹ See Gardner's oral history, "A Life in Higher Education: Fifteenth President of the University of California, 1982-1992," UC Berkeley Regional Oral History Office, 1997, 365-375.

²² Wen Ho Lee (with Helen Zia), *My Country versus Me: The First-Hand Account by the Los Alamos Scientist Who Was Falsely Accused of Being A Spy* (Hyperion, New York: 2001).

²³ Letter from Special Assistant James S. Kane to Professor Emeritus Herbert F. York, chair of the Scientific and Academic Advisory Committee, June 26, 1991.

²⁴ The faculty also voted in favor of UC's management in a 1996 poll by a margin of 61 to 39 percent.

²⁵ Minutes of the Committee on Oversight of the Department of Energy Laboratories, May 19, 2004.

²⁶ UC also won the competition for the Lawrence Berkeley National Laboratory, for which no business partner was required.

²⁷ "Alternative Futures for the Department of Energy Laboratories," Secretary of Energy Advisory Board Task Force on Alternative Futures for the Department of Energy National Laboratories, February 1995, 53.

²⁸ "On Renewal of the University of California Contracts with the Department of Energy for Management of the Livermore and Los Alamos National Laboratories," A Report by the Scientific and Academic Advisory Committee, May 18, 1990, 5.



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