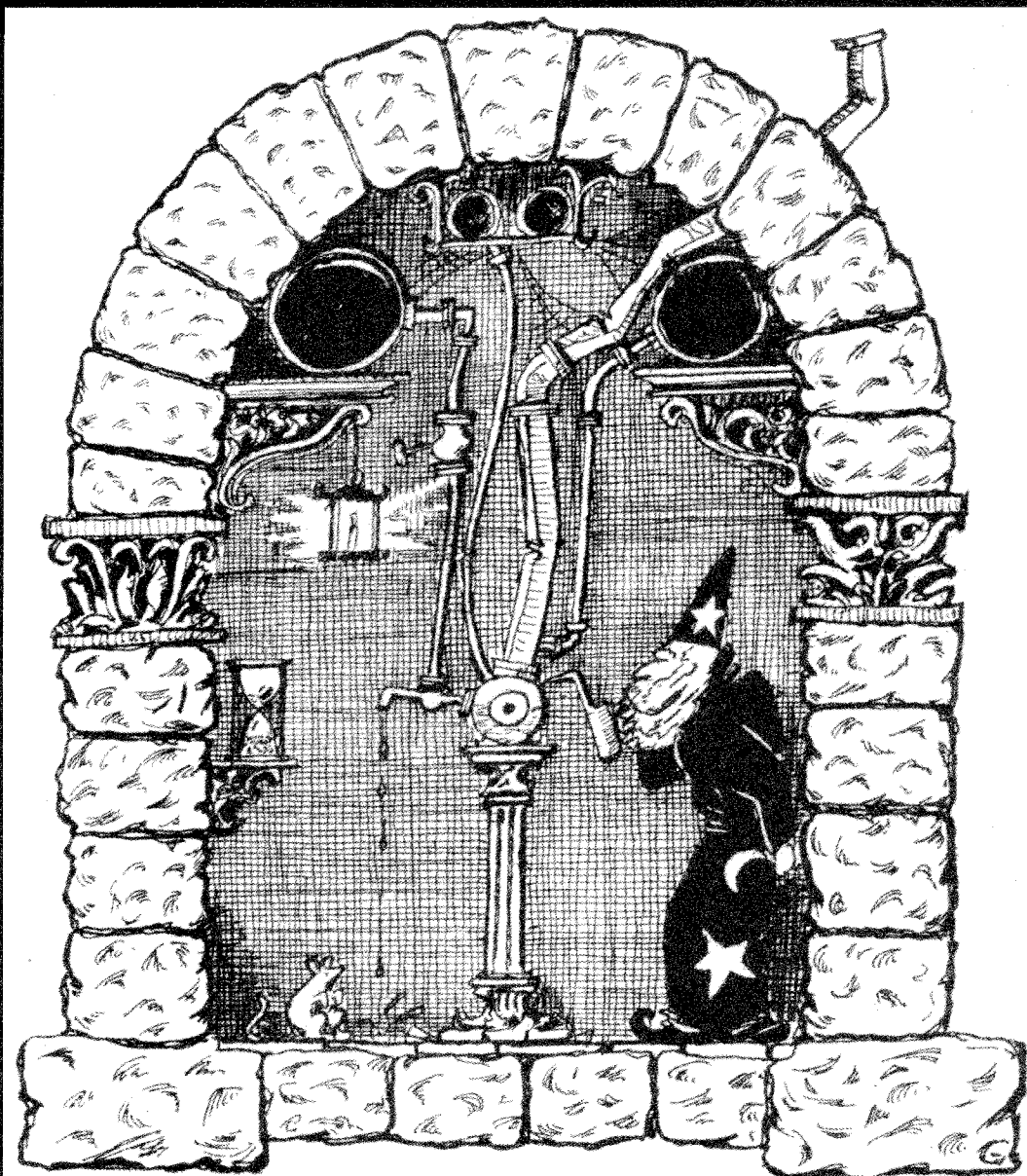


Sandstone & Tile

WINTER 2001

STANFORD HISTORICAL SOCIETY

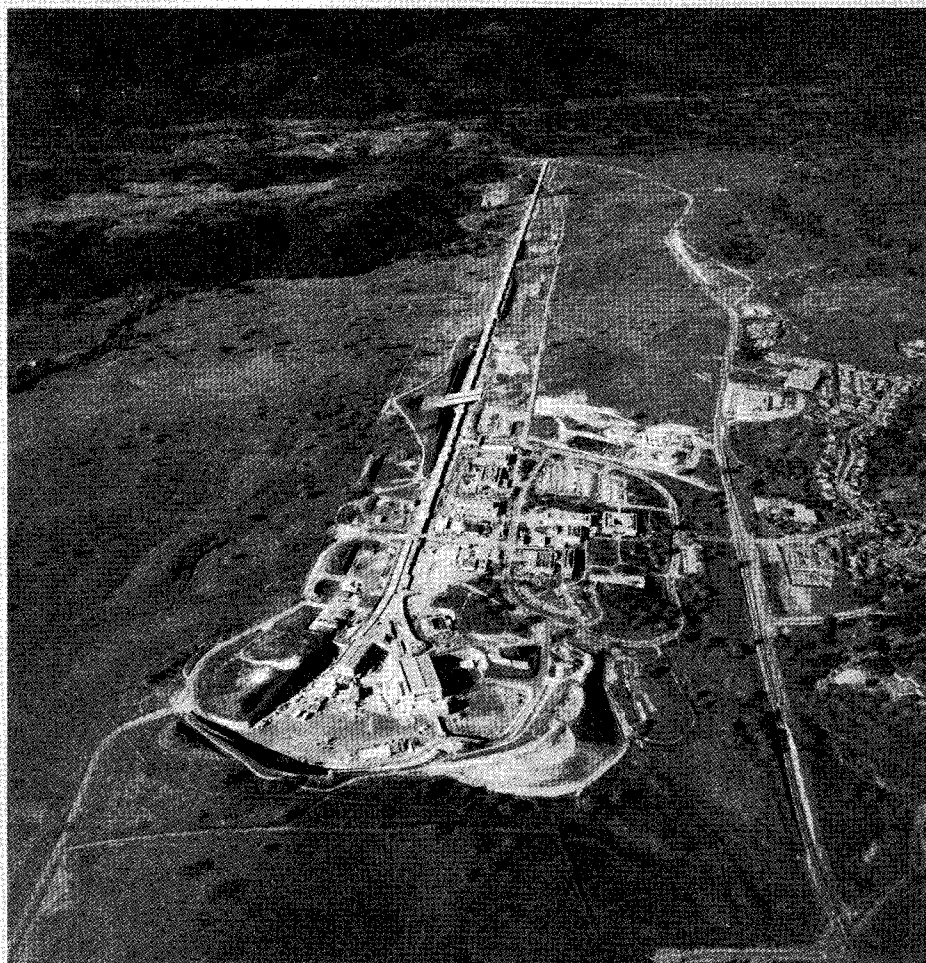
VOLUME 25, No. 1



*Stanford's Linear Accelerator
Typical Cross-Section*

- *SLAC's Early Days: An Eyewitness Account*
- *Pete Allen: A Retrospective*

A 1967 aerial view of the Stanford Linear Accelerator Center, paralleling Sand Hill Road; the 280 freeway overpass is under construction midway across the two-mile accelerator.



Cover:

SLAC's wizard of information, Gandalf the Grey, entertained Center staff with his less-than-scientific explanations of the progress and process of accelerator physics and engineering at Stanford. Gandalf was created for the SLAC Beam Line by Bob Gould, Chief Engineer at SLAC (1960-79).

WINTER 2001
VOL. 25 NO. 1

Sandstone & Tile

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Physics, Power, and Politics

Fear and Loathing

on the Electron Trail ♦

An Eyewitness Account of the Campaign for Congressional Approval
of the Stanford Linear Accelerator Center, 1959-1961

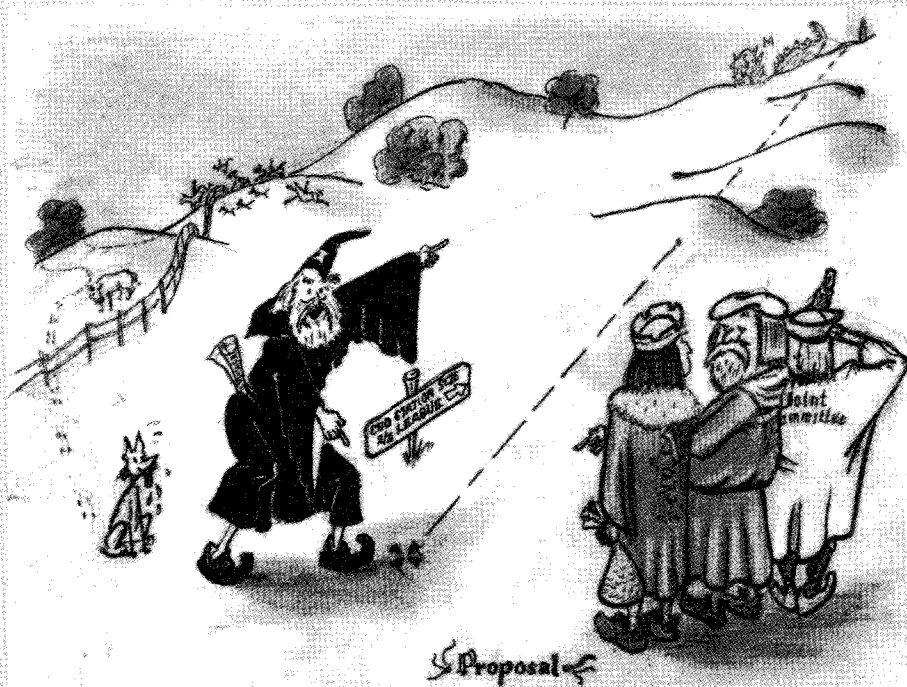
BY ROBERT MOULTON

Many years after the events in this story, author Bob Moulton went to Washington on another SLAC assignment: to help persuade Congress to finance a major, and very expensive, addition to SLAC's facilities. His companion in this pursuit was Dr. John Rees, an eminent SLAC physicist. Rees, like the scientists and engineers involved in the original SLAC proposal, expected Congress to behave in a scientifically explainable fashion. "As soon as our flight was airborne," Bob remembers, "John said to me: 'You've been through this routine before. What's the wiring diagram for approval?' I thought, Uh... wiring?... diagram? Here we go again." The way of politics is never linear, or easily diagrammed, as Bob's experience illustrates.

Editor

As I look back now at Stanford in 1957, I think of it as an institution furiously occupied in transforming itself from a very good regional institution to one that wanted to rank with any university in the world for leadership in quality and diversity. With so many things going on, focusing was difficult but essential.

Our basic problem was financial. In 1957, Ken Cuthbertson and I calculated that because Harvard's endowment was so large, it could go tuition-free and have more to spend per student per year than Stanford could from tuition and endowment combined. And we wanted to compete at their level? Our hurdle was clear. It was a marvelous atmosphere at Stanford, with optimism, risk-taking, and momentum in all directions—including the



♦ In his famous review of Hunter Thompson's *Fear and Loathing on the Campaign Trail, '72*, Frank Mankiewicz wrote that it "was the least factual, most accurate" account of the 1972 presidential campaign. I hope that description can be applied to what I have written here. Personal experience and memory are my principal sources.

possibility of world leadership in high energy physics. Why not?

My job at Stanford started in early October 1957. My first assignment: to forecast Stanford's total financial needs for the ensuing five years. Only a few weeks into it, Frederick Terman, then university provost, looked in at my office door. "Bob," he said, "because your schedule has more flexibility than most, I'd like you also to track the status of a proposal that Stanford has before the federal government to build and operate a two-mile long linear electron accelerator on our campus." I said I'd be glad to. I had no idea what a linear electron accelerator was, but I didn't ask the provost that question. I am sure it was just as well.¹

Immediately before coming to Stanford, I had been at the Ford Foundation as assistant to the foundation's chairman, Rowan Gaither. He had been asked by President Dwight Eisenhower to chair a committee



Robert Moulton

to make recommendations regarding a national program to construct back yard bomb shelters. The committee met in Washington, D.C. and gave me some appreciation of Washington ways, a useful background in Terman's view.

I soon learned that the accelerator Stanford had in mind was a high-energy instrument to conduct research in particle physics, investigating the composition of the physical world in its smallest dimensions. When these dimensions were defined for me, I was stunned: With the new machine, Stanford's scientists hoped to "see" particles as small as a billionth of an inch long which may exist for less than a billionth of a second.

Stanford University was the world's pioneer in linear electron acceleration. At the time of Terman's assignment to me, there was an operational machine, the Mark III, at the Hansen Laboratories on campus. It was in the midst of growing from 210 feet to 300 feet, hitting its limit with the end of the Microwave Laboratory building wall. Stanford scientists were confident that a new two-mile-long machine could be built without undue difficulty—it was simply a major extension of techniques and developments proven at Stanford. If built, it would explore the composition of physical matter in much greater detail than had been possible before. Its scientific usefulness and desirability were unquestioned. Support from fellow scientists for the merit of the proposal remained firm from the beginning, which was a deciding factor in its ultimate approval.

The principal problem at the outset, however, was its huge cost: At a price tag of approximately \$100 million, it would be the most expensive non-defense research venture in U.S. history. At Stanford, it was dubbed Project M, the "Monster." Competition for federal funding was fierce, but the often-unpredictable political barriers that soon emerged seemed even more daunting.

WASHINGTON POLITICS: ROUND ONE

Stanford was almost entirely without congressional political relationships. At the time, we had no contacts within the beltway, as we would say today. Unhappily, the only exception at the time was not in our favor: Tom Pike, chairman of Stanford's Board of Trustees, was an original backer of Vice President Richard Nixon and a contributor to Nixon's "Checkers Fund." For a Democratic Congress, Stanford's historic image as a "Republican Country Club" also was damaging. In the background was former U.S. President Herbert

STANFORD NEWS SERVICE



The Microwave Laboratory, seen here in 1950, housed Stanford's Mark III accelerator, forerunner for SLAC's two-mile accelerator. The 300 foot Mark III was dismantled in 1964.

Hoover's long-standing association with Stanford as an influential alumnus and powerful trustee. Indeed, there was a real basis for this partisan image: as far as we on the Stanford staff knew, there appeared to have been only one Democrat trustee (Judge Ben Duniway) in what was then Stanford's 60 years of existence.²

An unexpected event in 1959 red-flagged this partisan identity for congressional Democrats. At a black-tie dinner in New York honoring American scientific research, President Dwight Eisenhower recommended construction of a large, new electron linear accelerator in a nationally broadcast speech. "Physicists consider the project, which has been sponsored by Stanford University, to be of vital importance," he stated. "Because of the cost, such a project must become a Federal responsibility."³ The president's endorsement was almost certainly made at the urging of his science advisor, MIT's President James Killian.

At Stanford, we were elated. However, the administration had not observed the usual courtesy of advising, in advance, the Joint House/Senate Committee on Atomic Energy of Ike's intention to make this public announcement. The oversight in protocol thoroughly infuriated congressional Democrats, or so they said. While our accelerator project was now in the public eye, we were off to a clumsy start in the congressional approval process. Congressional Democrats let us know through their staff that there wasn't going to be "any damned Eisenhower accelerator built at Stanford or anywhere else." Some seemed to think that Tom Pike had Nixon persuade Eisenhower to back the proposal. I was confident then, and am confident now, that this alleged strategy never took place, but the problem had to be surmounted.

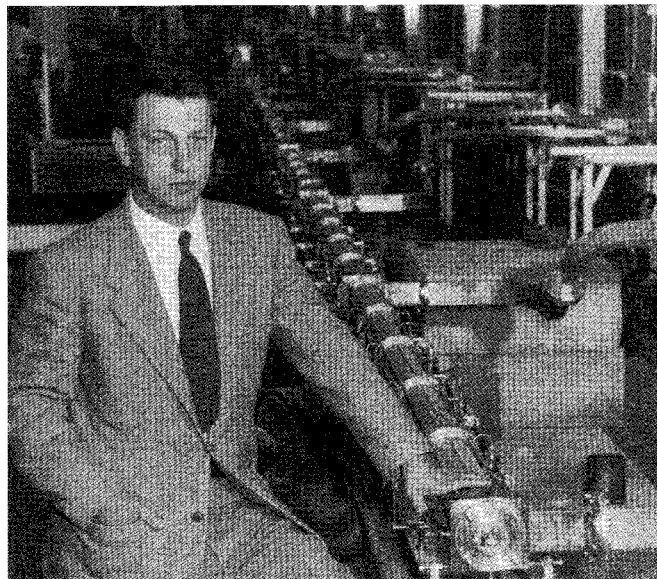
Eisenhower's endorsement kick-started hearings that took place between 1959 and 1961 before Congress's Joint Committee on Atomic Energy. This committee was chaired in alternate years by Sen. Clinton Anderson of New Mexico and Rep. Chet Holifield of California, both staunch liberal Democrats. (Anderson was then chairing the joint committee.)

The Stanford proposal was initially represented by two highly respected scientists and managers: Professor Edward Ginzton, accelerator engineer and director of the Microwave Laboratory, who served as Project M's first director; and Prof. Wolfgang Panofsky, high energy physicist and director of the High Energy Physics Laboratory. Both Ginzton and Panofsky had been involved from the very beginning in the analysis and preparation of the proposal. (Our first presentation to the committee was made by Ginzton. Panofsky was on sabbatical in Europe.) In addition,



Addressing a national symposium of basic research, President Eisenhower's endorsement of the Stanford proposal surprised congressional Republicans.

the Stanford contingent included three associate directors: Dr. Richard B. Neal, head of the project's technical division who would take charge of construction; Frederick Pindar, responsible for contracting and budget; and me, as liaison to the university's central administration.



Prof. Edward L. Ginzton, director of Stanford's Microwave Lab and first director of Project M, stands beside the Mark III (without its concrete shielding).

The committee staff had given us beforehand a list of questions of the kind we should be prepared to answer. However, the hearing began quite differently, with a hostile question posed by Sen. Anderson that was not on the list. What were the terms the university expected, he asked, for use of the Stanford land on which the accelerator would be built? He insisted that a representative of the Stanford administration immediately come forward to explain land use arrangements. My colleagues generously shoved me to the table in front of the Committee.

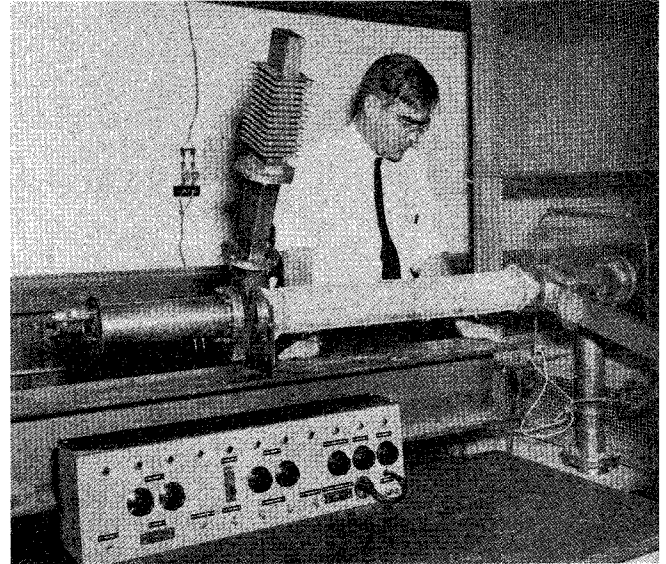
Nervous lest I say something that would damage our case, I explained that the land would be made available under a lease at \$1 a year. Anderson then challenged the need for a formal lease. I responded that Stanford could not sell or "alienate" land under Sen. Stanford's will except by condemnation, but it could lease the land at essentially no cost. This seemed the most practical solution (and was one we on the project had long favored). The subject was tabled for the time being, and we went on to the substance of the proposal, but terms for use of the land long remained a contentious issue.

Professor Ginzton then made a superb presentation on behalf of our proposal, answering a wide range of questions from committee members. Near the end of his presentation, however, Sen. Anderson jolted us again. He accused Ginzton of obvious conflict of interest due of his position as president of Varian Associates. Varian was likely to be one of the major suppliers of klystron tubes to the accelerator project, thus enriching both Varian and Ginzton, Anderson asserted.

STANFORD NEWS SERVICE



Prof. Wolfgang "Pief" Panofsky, SLAC's director, outlines plans for SLAC's controversial power lines at a San Mateo County supervisors meeting, 1966.



Prof. William W. Hansen with a section of Stanford's first successful linear accelerator, built in the Physics Department basement in 1947.

We sat stupefied. Shortly thereafter, the day's proceedings were adjourned. Somewhat in shock, our small group immediately went to Rep. Holifield's office. Yes, we had a big problem on our hands, he confirmed, and he advised us to go directly to Anderson's office to discuss it. He picked up the phone, called Anderson, and arranged for us to see him immediately.

Anderson was a crusty, smart, intimidating man. I'll never forget his statement to us as we walked into his office: "Well, I guess I won't have any competition for president of the son-of-a-bitch club after what I done to you guys today." We couldn't think of a suitable response.

Ginzton explained to the senator that the profit potential for Varian was small. He pointed out that there would be at least two major suppliers of klystrons, and that even if Varian Associates did *all* of the supplying, it would represent less than 1% of the company's gross annual business. The discussion that ensued was inconclusive and ended awkwardly. We expressed Stanford's willingness to provide further reassurance to Anderson and the committee on the subject of klystrons, and left the senator's office dazed and confused. We didn't know what the hell had happened. Had a minor problem surfaced, or was our proposal nearly destroyed?

After extended discussion with our informal legal advisor, trustee Robert Minge Brown, we agreed that Varian Associates would not bid on the klystron procurement contract, thereby removing any possibility of conflict of interest. Ultimately, this decision sat-

ified Sen. Anderson and the committee, and Varian's voluntary disqualification remained in effect for some five years.⁴

We were later told something of Anderson's personal history which helped explain his attitude and behavior. While working as a young journalist in New Mexico, he saw two beautiful Arabian horses being unloaded at the railroad station. He was sure the senator to whom they were to be delivered could not afford such horses. His investigation ultimately led to disclosure of the Teapot Dome government corruption scandal, and to Secretary of Interior Albert B. Fall's resignation and imprisonment. For the rest of his life, Anderson hunted for similar scandal, and he thought he'd found one in the Varian Associates bid. Perhaps if we had known of this earlier, we would have managed this point with less trauma. In an equally circuitous way, we learned that Anderson had met and admired an earlier Stanford president. He referred to the man as President "Terwilliger" (the only Terwilliger we knew was second baseman for the Chicago Cubs) but it didn't take us long to realize he was referring to the university's late President Donald B. Tresidder. Whether it would have helped us to know of this more positive tidbit at the start is hard to say, but given the way things seemed to be going, it couldn't have hurt.

BACK ON THE FARM

During the congressional hearings of 1959 and 1960, reservations were raised regarding the ultimate national value of such expensive basic research, the reliability of our cost estimates, the possibility of earthquake damage, and methods of managing design and construction. As a result, in 1960 Congress first authorized Stanford University to spend \$3 million on detailed architectural and engineering (A & E) studies. This was encouraging, but the move by no means guaranteed that the project would proceed, or proceed at Stanford.

Among other things, the A & E studies revealed that the original campus site suggested for the accelerator was geologically unsuitable. This first location ran from Sand Hill Road in the foothills along Junipero Serra toward San Jose, with the accelerator elevated across Page Mill Road and ending in a target area in what is now part of the Stanford Industrial Park. It is apparently characterized by "swelling and squeezing rock," which would have been too unstable for the accelerator.

A new site for the accelerator (its current location) was soon found, thanks to Stanford's immense

acreage, but this selection created internal problems. University officials had set aside the entire 480 acres we required, as well as some 90 adjacent acres, for residential leases. In fact, 30 of the 90 acres had already been built upon. University managers and trustees were counting on leases from housing developments of this sort to boost the university's income. Could it afford to let this source disappear, given that Stanford was badly under-financed at this time? The Trustees decided to request a 5 percent annual return of the market value of the land from the accelerator's lease holder, that is, the federal government.

No Action Yet on Project M Stanford Alumni Review

— October 1959 —

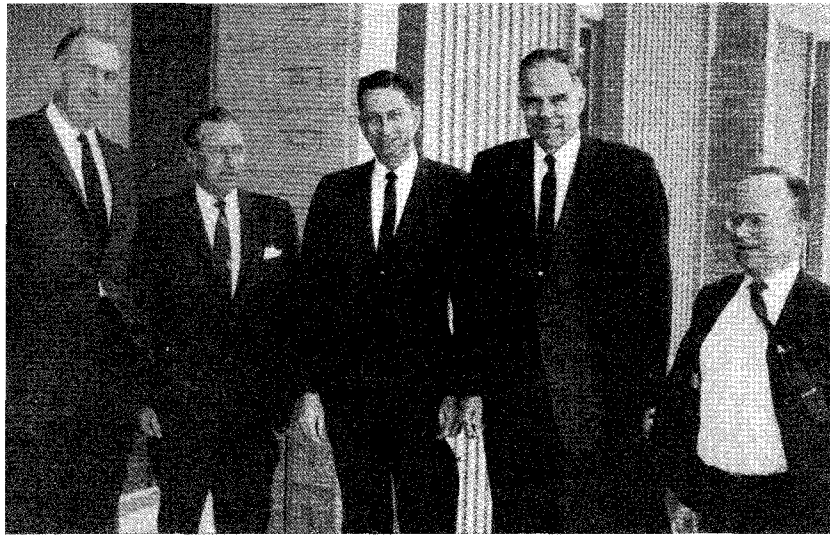
No recommendation on Stanford's proposed Project M—a linear accelerator two miles long to be located in the western foothills of the campus — had been made by the Joint Committee on Atomic Energy at the time Congress adjourned last month. Unless there is a special session, there can be no appropriation until 1960.

Project M calls for construction of a giant accelerator complex in two parallel tunnels at an estimated cost of \$100 million. It would produce 45 billion electron volts (the existing Stanford machine is rated at only one BEV).

Although the proposal apparently has more than enough backing to guarantee its eventual approval, there are several problems to be worked out—such things as whether it is to be supplied by public or private power, and ownership of patents.

Suggestions that the accelerator be built in an abandoned railroad tunnel in Washington State or an old mine shaft in Nevada faded against the need for location near an existing center of accelerator research.

Not surprisingly, this new land-use arrangement outraged the Joint Committee. It was directly at odds with my statement in the previous hearings that we would lease the acreage at \$1 a year, and it prompted Congressman Craig Hosmer, a Republican and a member of the joint committee, to refer to Stanford as "Uncle Shylock." On the other hand, a number of trustees still had the impression that the government was *imposing* the accelerator on Stanford and that,



As director of the AEC, scientist Glenn T. Seaborg (second from right, next to Panofsky, on a 1964 visit to SLAC) gave the Stanford project more consistent support than his businessman predecessor.

therefore, the trustees could expect the university to be properly reimbursed for accommodating the government. Trouble on this issue was still ahead—especially for me.

As the A & E studies progressed, proposed costs of the project continued to rise. We had to add to the proposal increases for cost escalation (inflation) and contingency (based on the higher numbers). If there was not much humor in the pursuit of the two-mile accelerator at this point, we tried to keep things in perspective. When a trustee asked Professor Ginzton what the machine would really cost, given the frequently changing numbers, Ginzton wryly responded: “The accelerator won’t cost anything: it’s all escalation and contingency.” As the dollar numbers grew steadily, someone suggested it might become very tempting for Congress to “waste” its \$3 million in A & E funds and “save” more than \$100 million by canceling the project as too expensive.

In addition to our local haggling over the campus site, other locations beyond Stanford, even outside of California, were proposed to the joint committee. A site across the Dumbarton Bridge at Coyote Point was put forward. Sen. Henry Jackson of Washington proposed an abandoned train tunnel in his state; Sen. Pat McCarran of Nevada proposed an abandoned silver mine in Nevada. The faculty made it clear, however, that since they were the only scientists truly qualified to build the machine and immediately use it, it would be built at Stanford, or not at all.⁵

When John McCone, a successful Southern Cali-

fornia businessman known personally by many of our trustees, became head of the Atomic Energy Commission, we felt greatly favored. As it turned out, his appointment only intensified our problems. McCone was unimpressed by basic research and favored applied research. Equally important, he wanted the accelerator, if built at all, produced in its entirety by private industry. Panofsky, Ginzton, and their Stanford colleagues put their heads together and agreed that the non-scientific elements—earth-moving, buildings, roads, and the like—could be privately contracted but they refused to give up construction the machine itself. In a very dramatic meeting, McCone asked Stanford trustees William Hewlett and David Packard, in the presence of Panofsky and Ginzton, “Does that mean if we insist on private contracts for the whole venture, Stanford will refuse to go ahead?” Dave Packard replied, “yes, that’s what it meant.” McCone accepted our position.

McCone was never reconciled to the SLAC project. He could not foresee practical applications coming from our project, and he resented our having reserved a large part of the work to ourselves. Although McCone supported SLAC publicly, it was well known in Washington circles that privately he did everything he could to kill it. “[McCone] objects to materials program as just a scientist’s trick, refers to linear accelerator as ‘your accelerator’; predicts no money from Congress,” Eisenhower’s science advisor George Kistiakowsky wrote in his diary in July 1959. “Then general opinion that scientists cause trouble in government... Rather evident McCone does not think much of ‘scientists.’” McCone was “very unenthusiastic on a number of grounds,” Kistiakowsky later commented.” (In 1961, McCone was replaced by a scientist, Glenn T. Seaborg, a change much to Stanford’s advantage.)⁶

What more could arise? A new political aspect came up in late 1960. After consistently assuring Sen. Anderson and others that we had not enlisted Nixon to secure Eisenhower’s backing for the accelerator proposal, we were stunned when *The Los Angeles Herald* ran a feature article headlined: “Nixon to be Stanford president.” Nixon had recently lost the presidency to Kennedy in a close election. Would movers and shakers now install Nixon as Stanford’s president, just as they had moved Eisenhower into Columbia’s presidency? The story was, of course, all wrong—Stanford was quite happy with its current president, Wally Sterling—but I hoped neither Anderson nor Holfield had seen the news story. We later learned that a reporter simply had noticed that the Nixon family would be vacationing in Arizona around the same



time the Stanford trustees were holding one of their meetings there, and drew his own conclusions. He didn't note that the two events were a week apart, with no real overlap, nor did he bother to verify if Stanford had any interest in finding a new president. Nevertheless, such a report was plausible enough: If a Republican power bloc could install Eisenhower in a comparable position, couldn't they do it at Stanford, already identified by its Republican credentials?

At about this time, we were told in confidence that John McCone, head of the Atomic Energy Commission, would make an unannounced summer visit to the campus. He'd hire a car, we were told, scout the proposed accelerator site, and declare it unsuitable. Since we did not know the date, how could we deal with this new bit of intrigue? It turned out to be fairly

simple. President Sterling and McCone were acquainted; both were members of the Bohemian Club. Every summer, the club put on its male-only encampment in the redwoods near Santa Rosa, a very prestigious gathering with members and guests attending from all over the country. Sterling called McCone and innocently asked if he would be attending the Bohemian Grove encampment. When McCone said yes, Sterling invited him to Stanford for a briefing on the status of the accelerator project to date and, incidentally, the merits of the proposed site. McCone accepted the invitation and, as far as we knew, did not openly oppose the planned site.

WASHINGTON: ROUND TWO

Back in Washington, the question of reimbursement for use of Stanford's acreage became a pivotal matter. During a Stanford Board of Trustees' meeting, the matter had been raised again, and I responded that I thought an attempt to recover "land rent" would kill the proposal in Congress. I was instructed that we should try to get a return, but that I should not press the issue to the point of endangering the project. At that point, I started to say that just to *mention* reimbursement would seriously threaten the project, but was cut short by the board chairman who said: "You have your instructions, and we have a long agenda, so we must move on." Herb Kinney of the AEC was waiting for a phone call regarding Stanford's position. With plenty of misgivings, I told him simply that the land would be rent-free. I was sure I was not expected to exercise that kind of discretion, but it seemed the right answer and the trustee phraseology seemed to permit it.



STANFORD NEWS SERVICE

Stanford representatives sign the \$114 million contract with the U.S. Atomic Energy Commission, May 1962. (Trustees Morris M. Doyle and Ira Lillick, seated, with Dwight B. Adams, university business manager; Project Director Wolfgang Panofsky; and Robert Minge Brown, university counsel.)

A couple of weeks later, Stanford trustee James Black called on his friend John McCone in Washington. Black told McCone that the board certainly hoped the AEC would reimburse Stanford for land use. McCone replied: "Two weeks ago, Bob Moulton reported that we could have it for nothing." Upset, McCone asked President Sterling to clarify Stanford's position. Sterling responded with a letter that could be interpreted two ways: some money or no money. "Which one is the case?" insisted McCone.

continued on page 12

David

and

GOLIATH

Well after authorization, with construction underway, the accelerator project faced a new political problem. Everyone realized at the time that the machine would use prodigious amounts of power—approximately the same amount consumed by the entire city of Palo Alto (with its population of more than 50,000). Operation of the accelerator required a 220,000-volt power source. The closest 220 kv line was on Skyline Ridge, some three to four miles from SLAC as the crow flies. We planned to bring power down the hillside on overhead lines. When Woodside residents read of the plan, however, they erupted in protest on both environmental and aesthetic grounds.

The issue came to a head in 1963 when the planning commission of town of Woodside refused a permit to PG&E to bring the line over-

head across the Woodside township boundaries, insisting that the lines be buried underground. Paul (Pete) McCloskey, a local attorney, was hired to keep our line off the hillside. Burying the lines, however, was prohibitively expensive (estimated at an additional \$2 million to \$4 million) in our view and that of the guys paying the bills—the AEC. There were only some 35 miles of 220 kv lines underground in the entire United States, almost all in cities and all of it running on flat terrain. For Stanford to bring 220 kv lines down the mountain-side underground would have been technically complicated, extremely costly, and of

questionable reliability.

As with many things political relating to the SLAC project, there was an ironic turn to this controversy. The publicity given locally to the subject was immense, and the tenor of it largely critical of SLAC and the university. Cartoons appeared in local newspapers portraying the government and Stanford jointly as Goliath, in the process of crushing the environmental heroics of pathetic little David—Woodside. In the battle for public opinion, however, Woodside, like David, had the edge. The local papers happily portrayed Stanford as ignoring aesthetic as well as environmental values of the foothills in its eagerness to complete SLAC. Even the *Washington Post* and *New York Times* ran anti-Stanford editorials on the topic, although without bothering to ask for an explanation of the university's position or a look at the plans. (The *Times* later retracted its statement.)

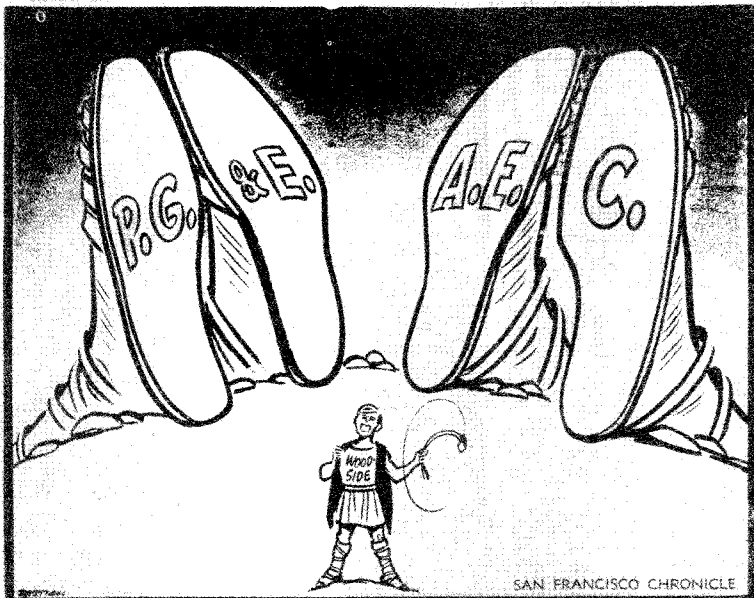
Not surprisingly, yet another unexpected incident took place. As Doug Dupen, who was responsible for SLAC's community relations at the time, later described the event:

I was on an errand, walking through the A&E [building] lobby, when the receptionist called out to me, "Doug, these two gentlemen want a tour of the site." I introduced myself to the two men and started to let them know that we usually conducted tours only by appointment. But before I could get the words out, the taller of the two introduced himself as Laurence Rockefeller and announced that he was at SLAC at the request of the president [Johnson] and wanted to be taken on a tour of SLAC's planned power line route and of the town of Woodside.

Tubular steel poles, specially designed to support the SLAC power line, about to be placed by helicopter to avoid site damage



STANFORD UNIVERSITY ACCELERATOR CENTER CENTER



Inasmuch as the power line controversy had occupied all my waking hours for months, I immediately responded with, "Right, I'm your man. Let's go." I ran back to my office and picked up a copy of the portfolio we had produced of Walter Zawojki's airbrush renderings of the various pole structures on the actual site photos taken by Dick Muffley. Then I returned and we walked out of the lobby to Rockefeller's waiting car...

First I took them on a tour along Sand Hill, Portola, and La Honda Roads and Skyline Boulevard to be able to point out where each of our structures would be installed. We got out of the car at several pole sites but particularly the one pole site actually within the limits of the Town of Woodside. Walter's renderings made it easy for Rockefeller to visualize the planned installations.

Then we toured the Town of Woodside itself. Our route was along Whiskey Hill, Woodside, Portola, and Phillip Roads.... Rockefeller was particularly stunned by the huge power substation in the Woodside Town Center adjacent to what was then the Pioneer Hotel.

(Doug Dupen to WHK Panofsky, memo, March 19, 1993, SLAC Archives)

The controversy went on for

two years, in and out of local commissions and the courts. Congressional committee hearings on the matter were scheduled. Among the many in attendance at the hearings was Thomas Kuchel, a Republican senator from Southern California and a Woodside ally. Early in the hearing, Congressman Holifield asked the committee staff to bring forward the photographs of Woodside's existing 12 kv lines. The 4-foot by 6-foot photos were damning indeed, showing ugly, multiple lines strung all over the beautiful Woodside landscape. What-

ever Woodside's good intentions, the revelation of past sins was devastating to Woodside's cause, particularly since, in past years Stanford, by comparison, had placed 12 kv lines within its own boundaries underground, absorbing the additional cost. When this was pointed out, Sen. Kuchel advised the chair that he had a conflicting committee meeting and excused himself. He left embarrassed and in a hurry. The issue was decided almost at that moment: if Woodside had not preserved its own environment, the argument ran, the government could not be expected to take on the job when it involved questionable technology and great added expense.

Worried about its huge investment in the SLAC project, the AEC, backed by a special act of Congress, proceeded to condemn the land required for the overhead route. Only one pole was constructed within Woodside boundaries. A graceful line using simple green tubular steel poles (instead of grillwork) was then installed by helicopter, which minimized damage to hillside growth. #

STANFORD NEWS SERVICE



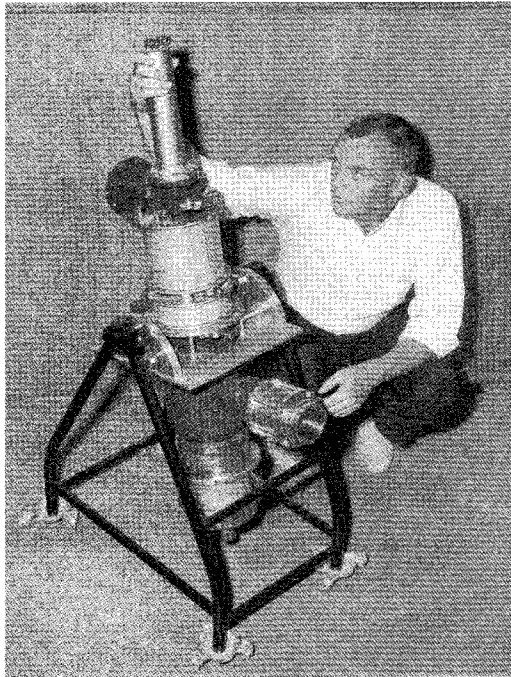
Doug Dupen (right) looks over construction of the center's beam switchyard with Stanford News Service writer Bob Lamar, 1965.

continued from page 9

By this time, we were at yet another monthly board meeting. Addressing the issue, Fred Terman said it was time to decide whether Stanford was a research institution or a real estate operation. While the board and Wally Sterling were concerned with finances, everyone involved trusted Terman's assessment of SLAC's importance to Stanford. There was plenty of tension. Trustee Monroe Spaght recommended that Sterling send a telegram saying, in effect: "Never mind what the letter *seems to say*, the government has the land for nothing." The Trustees concurred, as did Sterling. My head, neck attached, was returned to me.

Final hearings were held in May 1961, and the summer was filled with informal meetings and information sessions. Yet another stalemate occurred briefly when advocates of a completely different project insisted on coupling the Stanford project to their own. In the fall of that year, with John F. Kennedy now in the White House, the Senate met to act on a number of bills. Sen. John O. Pastore, vice-chairman of the AEC Joint Committee, strongly recommended passage of one of these bills. Written in obscure "Washingtonese," it contained approval for Stanford's linear accelerator without specifically naming Stanford anywhere in the congressional record. Congress passed the bill in September. Since the bill did not include specific language, Pastore felt compelled to explain: "Let me tell the senators what they have just done. They have approved \$5 million for research into cleaner burning of coal, and they have approved the Stanford Linear Accelerator..."

For us, the political irony was obvious: we were convinced that had Nixon beaten Kennedy, there



Bill Kirk, with a klystron tube (on display rack). As originally constructed, the two-mile linear accelerator incorporated 240 klystron tubes (rated up to 24 million watts peak power) to supply microwave power to boost beam energy to 25-45 billion volts.

would be no SLAC. The Democratic Congress probably would not have permitted it.

It was getting late that Friday afternoon in Washington. I called Bill Kirk, assistant to the director, who was waiting by the SLAC phone in California. He picked the receiver up and said: "This is the death watch..."

"Oh, no," I said, "it's not: we've just been approved." I could hear the start of excitement on the campus.

After that call, I walked over to the White House and watched the Kennedy helicopter take off for Hyannisport. When I returned to my hotel, I had a message that Congressman Holifield had called. After the innumerable calls we had made to him over the years, *he* finally called to tell us what by now we already knew—we had it made.

FOR ADDITIONAL READING ON THE EARLY YEARS OF SLAC, SEE:

[Doug Dupen] *An Informal History of SLAC* (Stanford, 1967?).

Peter Gallison, Bruce Hevley and Rebecca Lowen, "Controlling the Monster: Stanford and the Growth of Physics Research, 1935-1962," In *Big Science: The Growth of Large Scale Research* (Stanford: Stanford University Press, 1992), pp. 46-77.

Edward L. Ginzton, "An Informal History of SLAC—Part One: Early Accelerator Work at Stanford," *SLAC Beam Line*, special issue no. 2 (April 1983).

W.K.H. Panofsky, "An Informal History of SLAC—Part Two: The Evolution of SLAC and its Program," *SLAC Beam Line*, special issue no. 3 (May 1983).

W.K.H. Panofsky, "SLAC and Big Science: Stanford University," In *Big Science* (1992), pp. 129-146.

Other *Sandstone and Tile* articles on SLAC include W.K.H. Panofsky, "Big Physics and Small Physics at Stanford," 14:3 (Summer 1990), 1-7; and Andy Doty, "Paleoparadoxia Reassembled: Adele Panofsky's Inspirational Journey," 21:1 (Winter 1997) 3-10.

HELP FROM HOLLYWOOD

Shirley Temple Black had an unwitting, but helpful role in our effort for congressional approval. It goes like this: Two staff members from the Joint Committee on Atomic Energy and their wives visited Stanford to review our early plans for SLAC. One of the staff members was an electrical engineer who wanted desperately to meet Fred Terman, author of the definitive text for radio engineers. We could arrange that—and did.

The wives' fondest wish was to meet former child star Shirley Temple, now living in Woodside. Even though Shirley's husband, Charles Black, and I are Stanford classmates, such a request seemed intrusive. We did take the visitors to the best restaurant in Woodside for dinner, however. As we were leaving, there were Shirley and Charley at a table we had to pass by. Would we presume in those circumstances to introduce our guests? We would.

Shirley was gracious, the wives were thrilled, and another unexpected step toward government approval of SLAC had been taken.

Unfortunately, there seemed to be political fallout everywhere, however. We at SLAC always believed that it was the publicity he received while representing Woodside that allowed Pete McCloskey to defeat Shirley Temple Black in their contest for a congressional seat in 1967.

Author's note: Bob Moulton, '40, returned to Stanford in 1957 as assistant to President J.E. Wallace Sterling after working for the CIA and the Ford Foundation. Soon after arriving, he transferred to the SLAC project and subsequently served as Associate Director for Administrative Services (including community relations) until he retired in 1974. From 1974 to 1982, he was executive director, Low Income-Housing Corporation of Palo Alto.

ENDNOTES

¹ A formal proposal had been submitted in April 1957 by Stanford President J.E. Wallace Sterling to the U.S. Atomic Energy Commission, the National Science Foundation and the Department of Defense. By 1959, the AEC became the "cognizant" or sponsoring agency.

² Editor's note: There were other Democrats on the board, but not in recent memory (e.g. Stephen J. Field, an appointee of Leland Stanford).

³ Dwight D. Eisenhower, "Science: Handmaiden of Freedom,"

(address) New York City, Sloan Foundation Dinner, May 14, 1959. In *Public Papers of the Presidents: Dwight D. Eisenhower*, pp. 399-406. For an account of campus reaction to Eisenhower's announcement, see Peter Allen comments in "The News Behind the News: History, Headlines and Humor from the Stanford News Service" *Stanford Historical Society Sandstone & Tile* 17:1 (Winter 1993), pg. 17. (Allen erroneously dates the speech as occurring in 1958.)

⁴ Ginzton was a member of the Varian Board of Directors, as well as a Stanford faculty member and Director of the Stanford Microwave Laboratory. In 1959, after the unexpected death of Russell Varian, he chose to turn his full attention to Varian (where he was elected Chairman of the Board and CEO). His decision was based, he later wrote, on admitting to himself he would have no important role to play in continuing research on the two-mile accelerator because he was not a physicist, yet he felt assured that Panofsky could build the machine in his place. Edward Ginzton, *Times to Remember* (priv. printed), pp. 141-142.

⁵ *Hearings before the Subcommittee on Research and Development and the Subcommittee on Legislation of the Joint Committee on Atomic Energy, Congress of the United States, Eighty-Sixth Congress, First Session on Stanford Linear Electron Accelerator. July 14 and 15, 1959.*

⁶ George B. Kistiakowsky, *A Scientist at the White House: The Private Diary of President Eisenhower's Special Assistant for Science and Technology*. (Cambridge: Harvard University Press, 1976), p. 21 (July 24, 1959) and p. 148 (Nov. 10, 1959).