

THE SITE CONTEST FOR FERMILAB

More than 20 years ago 46 states fought to become the home of the largest particle accelerator of the era, the 200-BeV machine. The AEC decision has been haunted by political questions ever since.

Catherine L. Westfall

On 10 November the Department of Energy announced that the Superconducting Super Collider will be located on the Blackland Prairie corn and cotton fields around Waxahachie, Texas. The decision ended a competition entered by 25 states more than a year earlier. The contest for the SSC was reminiscent of way the site for Fermilab was chosen in 1966. Indeed, the procedure invented for selecting Fermilab was copied for the SSC, right down to the preliminary run-off refereed by a panel appointed by the National Academy of Sciences and the visits by a government team to the final few sites in the competition. Even the complaints from local citizens and the rumors of political influence that were rife during the Fermilab competition had their counterparts in the SSC contest.

For Fermilab, the suspense ended on 16 December 1966. On that day Glenn T. Seaborg, a distinguished chemist at the University of California at Berkeley who was then chairman of the Atomic Energy Commission, announced that the next high-energy accelerator would be built in Weston, Illinois, just west of Chicago. In the argot of high-energy physicists at the time, it was called the 200-BeV machine—though the abbreviation for billion electron volts soon became GeV, for gigavolts, which is the current usage. The AEC's choice of Weston, made over five other sites in the final run-off, was greeted with cheers in the Midwest. The runner-up, according to Seaborg, was a location near the University of Wisconsin at Madison, and, Seaborg remembers, the next best site was near Denver, Colorado.

Still, objections were raised to the winning location.

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Some of the nation's most experienced accelerator builders at the Lawrence Radiation Laboratory at Berkeley, having spent more than two years designing the 200-BeV machine, were angry that they had been deprived of the traditional prerogative of creating the facility at the site of their choice. Much more outspoken, however, was a nonscientific group, the National Association for the Advancement of Colored People. For months before the announcement the NAACP had criticized the Illinois record on civil rights, pointing out that of all the states in the final heat, Illinois alone lacked fair housing legislation.

Conventional wisdom in Washington at the time had placed the decision in the White House Oval Office. According to this view, President Lyndon B. Johnson directed the AEC members to select Weston as part of a political deal he had made with Everett M. Dirksen, the influential Illinois Senator who was the Republican minority leader. "Proof" for this speculation came when Dirksen suddenly switched from opposition to support of a fair housing bill a few months after the site selection was announced. If additional support for this notion were needed, the pundits asserted, it was that the President wanted to give Paul Douglas, a fervent supporter of the accelerator for his home state of Illinois, a parting gift on retirement from the Senate. And, anyway, so the story went, everybody knew that Johnson made such decisions himself, because he saw science and technology in terms of what they could do to solve problems—military, political, economic, any kind. After all, that was the way he viewed the space program.

The idea that Johnson was decisive in the choice of Illinois was accepted by many physicists who were surprised that neither Berkeley nor the Brookhaven National Laboratory had won the 200-BeV machine. Both centers were celebrated for their competence in designing



Illinois site covered 6800 acres of cornfields and dairy farms, along with an incorporated village of some 90 single-family prefabs. The village had neither shops nor schools for its population of 380. In fact its name, Weston, was also the name of a considerably larger and older town about 100 miles downstate. Soon after the AEC's decision was made to build the 200-BeV accelerator at the site, a real estate dealer put up the sign in the photograph and hoped to develop the area with more houses. Instead, the state bought the land and houses and conveyed these to the US government. About 12 farmhouses on the site were moved into the housing area. Most of the houses are still in use for visiting scientists and storage buildings in a cluster known as Fermilab Village. (Photo courtesy of Fermilab.)

and building particle accelerators. Even so, if a poll had been taken of the community's opinions at the time, it is virtually certain the results would show that most physicists were pleased that the public spectacle of site selection, with its petition drives and its protest demonstrations, had ended so that the new laboratory could proceed.¹

Indeed, the time had come for a large, high-energy accelerator. Ideas were popping up everywhere. One called for a cascade of synchrotrons to boost the particle energy—a concept suggested in the 1950s by Robert R. Wilson and others and first developed by Matthew Sands and his coworkers at Caltech. In 1963 a panel appointed by the AEC and the President's science adviser recommended that the US develop higher energy machines with storage rings. The panel, headed by Norman F. Ramsey of Harvard, and including many of the leading high-energy physicists as well as the president of the National Academy, Frederick Seitz, urged the AEC to authorize construction of the 200-BeV machine at Berkeley "at the earliest possible date." Although designing the accelerator posed no major technical difficulty, planning and organizing the expensive, one-of-a-kind laboratory was more problematic. Physicists debated various management schemes. In particular, young experimentalists, such as Leon Lederman, who is now director of Fermilab, pushed for assurance that the new facility would be a "truly national" laboratory with open access to all high-energy physicists.

The pressure for a truly national, high-energy physics center led to demands from various political and academic quarters for a nationwide competition to locate the new

machine. What was the site-selection procedure? Why was Illinois chosen? Who really made the decision? Such questions have vexed physicists and science policymakers for decades. Similar questions have been asked for the SSC project.

Winning the big machine

By the early 1960s momentum for building more powerful high-energy accelerators in the US was driven by an exciting series of achievements in the field of particle physics, especially the discovery of dozens of new particles. Proposals for such machines were stimulated by such technological advances as the discovery of phase stability, the development of alternating-gradient or "strong" focusing magnets and the use of beam stacking. For a decade, support for particle physics had been provided by the Office of Naval Research, the AEC and the newly formed National Science Foundation. The rising budgets were justified in political circles by the accumulation of Nobel prizes by US high-energy physicists as well as by advances in science, education and technology.

In 1960, when planning began for a machine in the 200-GeV range, about 20 US universities housed machines capable of more than 50 MeV. Several universities had developed different approaches for designing accelerators. Largely because of the ingenuity and influence of such dominant figures as Ernest Orlando Lawrence and Isidor I. Rabi, an elite group of accelerator designers held sway at Berkeley and at Brookhaven. Beginning with the Berkeley synchrocyclotron and synchrotron, then continuing with Brookhaven's Cosmotron, the Berkeley Bevatron and the Brookhaven Alternating Gradient Synchrotron, major



Famed physicists Ernest O. Lawrence (left) and I. I. Rabi (right) were longstanding rivals when it came to locating major particle accelerators in the 1950s. In April 1969 the AEC indicated that the new accelerator laboratory in Illinois would be named for Enrico Fermi (center), who had taught at the University of Chicago, 30 miles away. (Photo courtesy of AIP Niels Bohr Library.)

synchrotron projects had alternated between the two labs. When the Cambridge electron accelerator and the Stanford linear accelerator were built, doubts increased that large machines would go up anywhere but on the East and West coasts.

Lawrence's successor, Edwin M. McMillan, was confident that Berkeley would build and manage the next high-energy accelerator. His claim to the facility was based on Brookhaven's acquisition of the AGS, which, in 1960, had accelerated protons to 30 GeV. McMillan's expectation was further bolstered in 1963, when the AEC gave Berkeley funds for the preliminary design of the 200-BeV accelerator. In a 1962 report to the AEC, McMillan's group estimated that such a machine would cost \$263 million. Just then, the AEC was handed a \$148-million proposal from the Midwestern Universities Research Association, a group formed in 1954 to champion the interests of high-energy physicists in the region. Determined to develop a unique concept and thereby gain entry into AEC's accelerator budget, MURA physicists and engineers designed a particularly ambitious accelerator, the Fixed Field Alternating Gradient Synchrotron, a 12.5-GeV, high-intensity accelerator capable of producing

proton beams at least 100 times more intense than those in the Bevatron or Cosmotron. The 1963 Ramsey panel recommended going ahead with the MURA machine only if it did not delay the authorization to build the 200-BeV accelerator.

By 1964, however, events overtook the plans of MURA as well as those of the labs at Berkeley and Brookhaven. In consequence of a more stringent Federal budget, brought about largely by the escalating Vietnam War, as well as by increasing cost estimates for accelerators and diminishing enthusiasm for high-intensity machines in the wider physics community, MURA was denied construction funding. Midwestern physicists protested the decision to members of Congress and to politicians in the region. Their best chance to operate a world-class high-energy accelerator had been scuppered, they argued. Midwestern politicians, in turn, complained that their area had not received its fair share of research funding and held up MURA's case as a *cause célèbre*. The combined force of both groups produced considerable political pressure for a Midwestern accelerator, undermining McMillan's hopes to build the 200-BeV accelerator in California.

Many physicists believed they could obtain funding for only one accelerator in the \$250-million price range. Moreover, many young experimentalists complained that most large laboratories, and Berkeley in particular, favored inside users. In June 1963, for instance, Lederman wrote an informal report with the title "The Truly National Laboratory," using the initials TNL as a pun on Brookhaven National Laboratory (BNL), which he claimed was not functioning as a truly national facility. Lederman insisted that large labs, including the proposed 200-BeV accelerator, should be accessible *as a right* to all high-energy physicists with competitive proposals.

In response to such demands, the Ramsey panel had proposed that the facility should be managed by a corporation with nationwide representation. The panel's recommendation received strong support from prospective users outside Berkeley and Brookhaven orbits. McMillan, however, insisted that a national management group would prove difficult to assemble and would waste time in reaching consensus. Furthermore, he said, such a group was not needed to ensure wide access.

Managing the new machine

Ironically, the impetus for a new management organization was advanced by the formidable funding difficulties anticipated for the proposed machine. On Capitol Hill and in the physics community there were advocates of more immediately practical projects, such as nuclear power reactors. Some decried the rise in appropriations for basic research and blamed the high cost of building and operating accelerators. Seitz worried that such complaints would fragment the physics community, which was already taking sides over the MURA debacle. Without the unified support of the physics community, Seitz and others reasoned, the chances would be small for getting the necessary funds to design and construct the accelerator.

Therefore, when the Berkeley lab's own advisory committee was unable to agree on a management scheme in November 1964, Seitz intervened. On the strength of his considerable influence as the academy president, Seitz called a meeting of 25 university presidents on 17 January 1965 to discuss various options for managing and administering a new accelerator laboratory. The meeting started a train of events that culminated with the formation of the Universities Research Association, which would build, manage and operate the 200-BeV accelerator under contract with the AEC.



AEC commissioners who made the decision to place the 200-BeV proton machine in Weston, Illinois, pose for this official AEC photograph. Left to right: Samuel M. Nabrit, Wilfred E. Johnson, Glenn T. Seaborg, General Manager Robert E. Hollingsworth, James T. Ramey and Gerald F. Tape.

The participants in the January meeting discussed the possibility that URA would not only manage the new laboratory but might also choose its site. In March 1965 Seitz and Seaborg conceived an alternate plan for selecting the location. To shelter the AEC from the full impact of the inevitable sore feelings of losers, an Academy Site Evaluation Committee was formed, under the chairmanship of Emanuel R. Piore, vice president and chief scientist of IBM. Members of the committee were Robert Bacher, Harvey Brooks, Val Fitch, William Fretter, William Fry, Edwin Goldwasser, G. Kenneth Green, Herbert E. Longenecker and Kenneth Reed, as well as such outstanding national figures as Crawford H. Greenewalt, president of E. I. du Pont de Nemours Inc, and John W. Gardner, president of the Carnegie Corporation of New York and director of several large companies.

The plan called for the AEC to solicit proposals and submit to the committee only those applications that passed the minimal requirements. Seaborg's letter to Seitz on 2 March 1965 included a set of criteria the AEC had collected over the years from studies of possible locations for a large accelerator. Among the criteria: suitable geology, sufficient power and water at reasonable cost, enough land for possible expansion, accessibility to a major airport and transportation hub, proximity to a cultural center that included both a major university and a research and development base, and availability of technical and office staff in the region.

Choosing the best site

Before the AEC signed a contract with the academy, the Subcommittee on Research, Development and Radiation of Congress's Joint Committee on Atomic Energy held four days of hearings on the high-energy research program. The subcommittee chairman, Melvin Price, a Democrat from Illinois, and other members seemed particularly concerned that the AEC had made no commitments about the future location of the new machine. When the Congressional subcommittee insisted that the AEC take final responsibility for the politically sensitive competition for the site of the accelerator, Seaborg agreed that the commissioners would make the final decision. The

academy committee, it was made clear at the hearings, would only provide a short list of finalists from the proposals submitted to it by the AEC.

Despite the careful arrangements made by Seaborg and Seitz, the selection process caused headaches from the beginning. An immediate problem was the unexpected number of proposals. The AEC received 126 proposals consisting of more than 200 sites in 46 states. A group of Midwestern physicists spearheaded a proposal for Madison, Wisconsin, the site of the former MURA headquarters. Brookhaven submitted a proposal and Berkeley submitted proposals for two sites, one near Sacramento in the Sierra Nevada foothills and another at Camp Parks in the Livermore-Amador Valley. Proposals were also sent from several AEC complexes, including those at Hanford, Washington, and at Oak Ridge, Tennessee.² Because of the widespread belief that the accelerator lab would bring political prestige and economic benefit to any nearby towns, a large number of proposals were submitted by citizens groups with no connection at all to the high-energy physics community or to the AEC. All the proposals were championed by local politicians, who immediately envisaged the virtues of winning the prize for their constituents.

Seaborg was soon faced with another problem: interference from the White House. When the AEC screening group skimmed 35 sites from the bulk of site candidates, the President intervened, insisting that Austin, Texas, be included on the preliminary list. To satisfy Johnson, extricate the AEC from the uncomfortable position of eliminating sites with minimal requirements, and increase the base of support in Congress, the AEC subsequently forwarded proposals for 85 sites to the Piore committee. While this move strengthened the position of the AEC and increased funding prospects for the accelerator, it placed a considerable burden on the academy panel. Moreover, the AEC attracted criticism because of the enlarged list, including an angry public statement from a leading member of the Joint Committee, Representative Craig Hosmer, a California Republican. Hosmer charged that the AEC had "bungled" siting arrangements, which were now "mired in a mammoth pork barrel."

Such criticism simply increased the efforts of the academy's Piore committee to make sure that it narrowed the field fairly and credibly. Believing that it was important to visit all 85 sites and worried that the Piore committee was already overburdened, Seaborg dispatched teams of AEC technical experts to the sites. Each team included at least one high-energy physicist. After each visit a report about the site was sent to the Piore committee, and, in most cases, committee members interviewed the AEC team leader. The committee's final report said the members made about 25 site visits "to get first-hand impressions" and "to sharpen their own insight about the factors important in site selection." To obtain additional advice and insight, the committee formed two panels of specialists: one examined the geological suitability of sites and another the physical attributes affecting construction and operation, such as power, water and climate.³ While all this was going on, the Piore committee continually amended and refined the site criteria. At one point, Piore polled members of the physics community to get advice on site criteria, and the AEC presented a new set of criteria for consideration.

As the Piore group began evaluating all the accumulated data in late 1965, the members soon realized that the final choice would hinge on some intangibles. Many of the sites could be characterized by minimal risk of geological instability, but the least expensive construction sites were not necessarily the best. Indeed, in its final report the committee argued that "the ultimate cost of the project depends less on the physical features of the site than on the competence and ingenuity of the physicists and engineers who will design the facility and be responsible for its operation." The January 1966 report of the academy panel studying the physical attributes of the sites reinforced this finding. Because "application of ingenuity and money can overcome most physical disadvantages of a particular site," the panel claimed, "a prime consideration is the attractiveness of the site and its environment for the permanent staff," and "this consideration should not be subordinated to the physical ones."⁴

Deciding on a few choice sites

Once this was agreed to, the Piore committee found it relatively easy to narrow the field to a few choice sites. These included, among others, the two locations in California as well as the Brookhaven lab, two sites in the Chicago area and places near Denver, around Madison, and close to Ann Arbor, Michigan. According to notes taken by an AEC representative at a full committee meeting in November 1965, Piore had made the point that because of the expense of in-depth site evaluation, which could run as high as \$1 million, his committee was concentrating on the best sites. When questioned about this by Seaborg, Piore admitted the committee was not "using the point systems at all," and only applying ratings "to check their judgments and conclusions reached by other means."⁵

Some AEC members expressed disappointment that so few AEC facilities were included among the choice candidates. They also seemed concerned that, in the desire to name a site that could be defended against technical and political attacks, so many proposals were being dismissed so quickly.

One physicist on the committee, Goldwasser of the University of Illinois, stated in a letter to Piore on 13 October 1965 that political considerations were clearly "involved in this decision." Unless the list of finalists was "quite universally accepted" by the AEC as well as by physicists, the public and the President, the exercise of site selection was "fruitless."

Such concerns led the AEC and the Piore committee to prepare charts ranking the strengths and weaknesses of various sites. In addition, although committee members seriously considered choosing their preferred site from the list of choice sites, they ultimately decided to submit a list of several sites with top qualities. They were pleased that these were widely dispersed across the country. Goldwasser remembers that the committee believed it would allow the AEC to consider the "political reality" when determining the preferred site.

In March 1966 the Piore committee submitted its list of finalists. In explaining the basis for its recommendations, the committee report noted that the members first determined whether "a given site had suitable physical properties," then "assigned paramount importance to the considerations that affect the recruiting of personnel for the national accelerator laboratory and the participation of the nation's high-energy physicists." The report said that although none of the sites was found to be "ideal," the committee found several sites that, "in general," satisfied all important requirements. Brookhaven and one of the California sites, the Sierra Nevada location, were on the list; the other California site, Camp Parks, was ruled out because the geology experts had found that the area could be affected by earth tremors and quakes. The list of finalists also had Ann Arbor, Michigan; Denver, Colorado; Madison, Wisconsin; and two sites in Illinois—South Barrington and Weston.

From the outset of the selection process, Seaborg made a point of keeping the White House and Congress informed—an action considered politically prudent because opposition by either would most likely jeopardize the project's ultimate funding. By mid-June 1966, Seaborg had ironed out a plan for participation by the White House and the Bureau of the Budget in site selection. Seaborg's notes from a 13 June meeting with the President's special assistant, Joseph A. Califano Jr, indicate that the AEC chairman would discuss prospective sites with Charles L. Schultze, director of the Bureau of the Budget, "at a stage just before the commissioners have made their final decision, but when the possible identity of the site is becoming known." Seaborg would then "get in touch with . . . Califano to get a feeling for the timing of the announcement and any possible White House reaction to the choice."⁶

In this way, Seaborg could keep the Budget Bureau and White House informed and give each a chance to argue against the AEC choice before a public announcement was made, thus avoiding the carnage that would certainly result from naming a site that the White House found unacceptable. At the same time the AEC was free from direct intervention while the decision was being made, and the commissioners would be able to deny, in good conscience, that politicians were dictating the choice of the final site.

While these steps were being taken, the AEC also quickly made arrangements to judge the site list provided by the Piore committee. Plans were made for site visits by AEC staff, with at least one commissioner taking part. The visits enabled the proponents to plead their cause directly. At these visits, the local advocates provided supplementary information and the AEC members were able to obtain more data. Thus, local utility companies were asked to provide data on projected power costs and the governors of the six states were asked to clarify the commitments made by local groups and politicians. With this information, the AEC staff prepared detailed reports to help the commissioners make their decision.⁷

In the midst of the AEC's deliberations, promotion efforts for individual sites reached a near frenzy. For



On an inspection trip to the Weston site in April 1966, AEC Chairman Seaborg spoke to the residents. To his left were Illinois Governor Otto Kerner Jr., village president Arthur Theriault and Illinois Senator Paul H. Douglas. (Photo courtesy of Fermilab.)

instance, the Long Island Association of Commerce and Industry announced on 15 April that its research "verified that all the competing sites have, as of this date ... launched a major political program." The Long Island group itself organized meetings with local politicians and with education, labor and business leaders to lobby support for the project. Similar efforts were made for other sites. In Illinois, after a 13-day campaign, a citizens group presented Governor Otto Kerner with 6727 signatures of residents and landowners supporting the Weston site. Kerner had already endorsed efforts to make Illinois the new home for the accelerator, calling it the "greatest scientific prize in this century."

Indeed, all six final sites had their ardent proponents. Every member of the California delegation to the House of Representatives, with the exception of Hosmer, who reserved judgment, signed a letter to Seaborg insisting that "on the merits" the California site was "the obvious and only possible choice." The Colorado promoters were led, not surprisingly, by Governor John Love. The Madison site was warmly endorsed by Governor Warren Knowles, by the Wisconsin State Chamber of Commerce and by the Madison Federation of Labor. Michigan Governor George Romney declared in a letter to Seaborg that his state could "match or excel others in any requirement that may be considered."

An AEC tally of Congressional inquiries, compiled when the agency began its final evaluation, indicated that the Illinois site had especially strong support, with 27 House members backing it. The New York and Michigan sites came in with 20 and 19 members, respectively. Congressmen in Illinois, Wisconsin and Michigan, unlike

those favoring other sites, lobbied for their regions, as well as for individual sites, further amplifying the strength of Midwestern support.

Despite the dramatic campaign efforts, some citizens protested against building the accelerator at their localities. The strongest complaints came, paradoxically, from Illinois. On 5 April, just as the AEC was beginning its final evaluation, the State of Illinois withdrew the South Barrington site from competition, noting strong community opposition to building the accelerator in the affluent Chicago suburb. *Science* reported that South Barrington residents feared that the influx of physicists would endanger the community's "moral fiber." In contrast, residents of the village of Weston actively campaigned for the project, proclaiming that it would bring prosperity to their community. However, farmers close to the Weston site complained vehemently, and a petition with 114 signatures opposing the use of the site was sent to the AEC. As one irate farmer explained in a letter to President Johnson, local farmers considered it "dastardly" to place such a facility on "some of the richest farming soil in the world."⁸

Many physicists also had strong views about where the machine should go. Commissioner Gerald F. Tape, who acted as the liaison between the AEC and the physics community, remembers that many Berkeley and Brookhaven physicists acted as though the accelerator could not be built anywhere except at their labs. The commissioners saw the matter differently. In their view, as Tape remembers it, the decision to have a site competition could not be defended if the location of the design team was the determining factor. How could the AEC mount an

Cost estimates of six finalist sites for 200-BeV accelerator

Site	Projected basis		Projected basis plus excluded costs		Judgment of engineering staff about projected cost range
	(in thousands of dollars)	(in thousands of dollars)	(in thousands of dollars)	(in thousands of dollars)	
	Min.	Max.	Min.	Max.	
Ann Arbor	251 200	297 100	253 200	299 100	Closer to max.
Brookhaven	263 900	285 300	264 100	285 800	Average
Chicago	246 500	293 400	247 400	294 400	Closer to min.
Denver	237 700	243 800	239 800	247 900	Average
Madison	243 100	248 300	244 900	250 100	Average
Sierra	239 810	246 330	240 410	247 330	Closer to max.

Table adapted from J. A. Erlewine, memo to G. T. Seaborg, W. E. Johnson, S. M. Nabrit, J. T. Ramey, G. F. Tape, 21 November 1966, box 139, Seaborg Collection, DOE Archives.

expensive, time-consuming site selection process, said Tape, "and then turn around and say the machine goes to Berkeley or Brookhaven because of proven competence," a fact well known at the onset?

Thus, it would have been difficult to defend the choice of either Brookhaven or the California site unless an extremely convincing case could have been made without reference to the expertise of local design groups, which considerably weakened the chances of both laboratories. Physicists at both laboratories sensed this, but in light of their growing list of disappointments, McMillan and his staff were particularly upset. Tape concluded: "Old habits had to change, and it was a painful time for all of us."

The AEC soon faced another dilemma. The agency had hoped to make a final site decision as early as July 1966, but in late June Seaborg received a letter from Clarence Mitchell, director of the Washington Bureau of the NAACP. Mitchell argued that Illinois had failed to pass legislation to enforce open occupancy laws and had a history of housing discrimination. Any hope for an imminent decision vanished as the AEC mounted an extensive campaign to investigate civil rights compliance at the six final sites. By the end of July, proposers were asked to provide assurances from local governments, labor unions, real estate associations, and citizens groups that minorities would not face discrimination in the communities surrounding the proposed sites. At the same time, the AEC asked for judgments on the six communities from the Equal Employment Opportunity Commission, the Community Relations Service of the Department of Justice, the President's Committee on Equal Opportunity in Housing, the Commission on Civil Rights, the Civil Service Commission, and the Office of Federal Contracts Compliance of the Department of Labor.⁹

In November 1966, after eight months of deliberation, the commissioners were ready to make the final decision. By this time, the AEC staff had summarized site information, including staff studies of operation and construction costs, into a working paper, "200 BeV Summary." It was placed into the hands of the commissioners just before the final decision was announced. Although this document did not give detailed information about the status of civil rights, such information had been summarized for the commissioners in August. While the commissioners may have discounted this evidence and made the decision on some other basis, or might have let others influence the decision, as is often claimed, the summary provides a solid foundation for judging the sites on the AEC's own criteria.¹⁰

The November summary revealed many similarities

among the six sites. When land suitability was judged, all sites had sufficient acreage, could be turned over to the AEC at no cost, and had adequate subsurface and surface soils to support the proposed accelerator while the land was in use for grazing. All were within an hour's ride to communities of reasonable size. All had adequate power and water supplies for the accelerator. And, most important, the annual operating costs for all sites ranged from \$63 719 million for Ann Arbor to \$65 045 million for Brookhaven, a difference of only 2%.

Weighing some critical factors

Despite the similarities, there were critical differences. The Weston and Brookhaven sites showed less promise for future expansion than the other locations, and the Madison site had elevation differentials that exceeded the 100-foot limit set by the criteria. Construction cost comparisons (see the table above) showed that if all costs were considered, the accelerator would be most expensive to build at Ann Arbor, with Brookhaven a close second. The least expensive place was Denver, with the California site a close second. When the accessibility factor was compared for users, Weston and Ann Arbor topped the list, with an estimated average travel time of 3.5 hours for all groups and accessibility in one day for 77% of users in major cities. The California site had by far the poorest rating, with an average travel time of almost 7 hours and only 23% accessibility. Denver also ranked poorly, with an average travel time of almost 5 hours and only 23% accessibility.

The August memorandum giving the status of civil rights at the six sites showed that all sites were similar in many ways. As the report explained: "All six states have fair employment practices laws with enforcement provisions." In addition, the Equal Employment Opportunity Commission considered "the employment attitude at all sites generally progressive." The AEC staff concluded that discrimination was unlikely at schools, hospitals and stores at all sites. Nonetheless, the report stated that Illinois had "no fair housing laws" and generally "adverse comments" had been received about two site areas: "the Ann Arbor NAACP expressed the opinion that Negroes suffer discrimination in that area; civil rights leaders in DuPage County express doubt that assurance of nondiscrimination would be honored." Evaluating such information posed a challenge for the commissioners. Although some site information, for example construction costs and estimated travel times, could be easily ranked, the commissioners had to find a way to weigh the political and social factors that could easily kill the project. They were

Breaking ground for the linac at the site of Fermilab on 1 December 1968 were Robert R. Wilson, who was named laboratory director in March 1967, and Seaborg (at rear). To about 1000 physicists and politicians who attended the ceremony, Seaborg said: "Symbolically we could say that the spade that breaks ground on this site today begins our deepest penetration yet into the mysteries of the physical forces that comprise our universe." (Photo courtesy of Argonne National Laboratory.)

also under considerable pressure to produce a site that could be defended to both physicists and politicians as undoubtedly best.

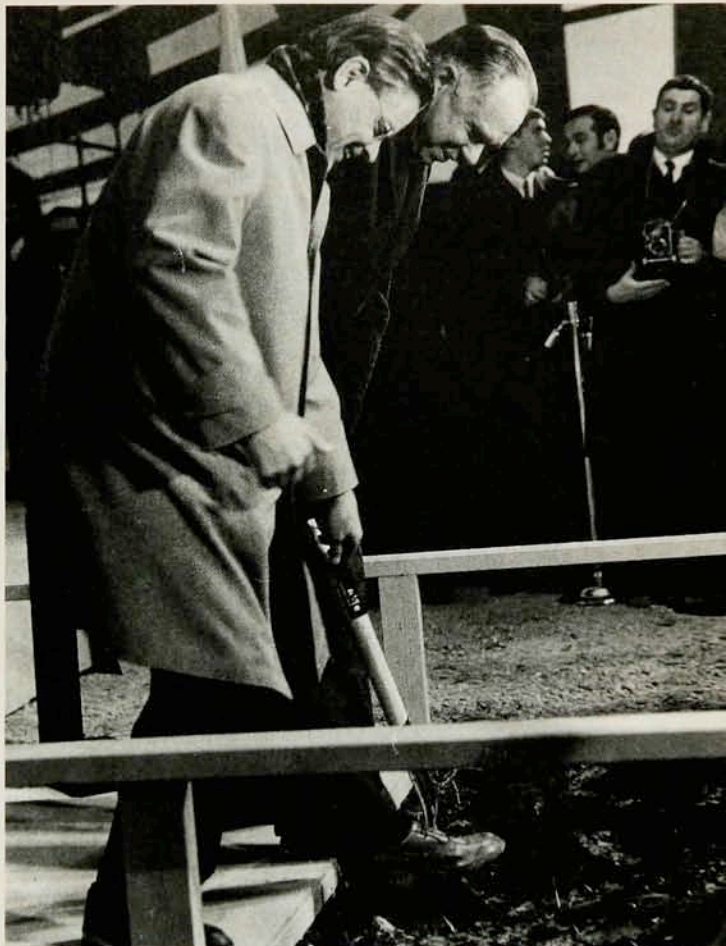
Geographical considerations aside, many politicians and the Budget Bureau would surely see Denver as the most attractive site because the accelerator could be built there at the least cost. However, the Piore committee had judged, and the AEC had concurred, that construction costs were not as important as factors that would influence staff recruitment and use of the facility.

The most straightforward measure of the use of the facility was accessibility to outside users. When this factor was given top priority, the Ann Arbor and Weston sites topped the list. This was most likely to please active experimentalists in much of the country and eliminate the California and Brookhaven sites, which clearly scored highest in the potential to recruit staff because of the large staffs already working at those labs. But the commissioners would have had a hard time defending the choice of either Brookhaven or the California site if staff availability were given the prime consideration. Moreover, both sites got poor ratings in other important criteria: Brookhaven was the second most expensive site and the California site the least accessible.

According to Seaborg's records, on 29 November the commissioners narrowed the list of sites to Weston and Madison. On 7 December, after making sure that the Budget Bureau and the White House knew a decision was imminent, the Commission selected the Weston site. As recorded in Seaborg's diary, Chet Holifield, a California Democrat who was chairman of the Joint Committee on Atomic Energy, quizzed him on how the site was chosen. Seaborg noted his answer: the commissioners had "added up the positive factors of each site and it seemed that Chicago came out ahead." In a report entitled "Basis for the Selection of the Chicago (Weston) Site for Location of the 200-BeV Laboratory," dated 17 January 1967, the AEC defended its choice by emphasizing its accessibility, which would "assure that all available talents can be readily and speedily brought to bear on its design and use, even though many contributing scientists may never be actual members of the laboratory's staff."

In recent interviews, Seaborg, Tape, James T. Ramey and Samuel M. Nabrit said they were troubled by Illinois's civil rights problems at the time of their decision but they ultimately decided that Weston's advantages more than offset this matter. Although cost comparisons were taken into account, in the end accessibility was considered most important. Weston's easy accessibility clinched their decision.

While they knew that the choice of a Midwest site was politically expedient, if only to make up for MURA's unfortunate demise, the commissioners were pleased that Weston won on its merits, not as a consolation prize. Long before the winning site was announced, some doubted that the AEC would make the final decision. In November 1965, more than a year before the decision was made, UCLA Vice Chancellor Carl York predicted that Johnson



would determine the site. Well aware of this skeptical opinion of the agency's role in determining the site, Seaborg began denying such accusations the day the decision was announced. He still continues to insist that the commission received no pressure or interference from anyone in making the final choice. Seaborg's statement was recently confirmed in interviews with Tape, Ramey and Nabrit, the other surviving commissioners who served during this period.

Even so, tales of President Johnson's role still persist. A few months after the decision was announced, *Newsweek* repeated the more specific rumor that "Senate GOP Leader Everett Dirksen . . . might be brought around" to support a fair housing bill pushed by Johnson "by the prospect of a \$375-million nuclear accelerator to be built back home in Illinois." When the bill came to a vote the next year, Dirksen did indeed switch and both houses of Congress passed it in April 1968. In *Poliscide*, a 1976 treatise decrying the acquisition of land for the accelerator, Theodore J. Lowi and Benjamin Ginsberg quote Senator Douglas saying he "got a solid promise with something of an escape clause" that the accelerator would be located in Illinois. The idea that Johnson was willing to promote a Midwestern site was particularly believable in light of his well-publicized January 1964 letter to Hubert Humphrey after the defeat of MURA, stating his "strong desire to support the development of centers of scientific strength in the Midwest. . . ."¹¹

That Illinois was Johnson's preference also has been repeated by other sources. In 1980, David Z. Robinson, who worked at the White House Office of Science and

Technology in the mid-1960s, asserted: "The AEC sent proposals for six finalists to the President and Johnson personally picked a site in Batavia, Illinois." This remark was used by W. Henry Lambright, a Syracuse University political scientist, in his examination of *Presidential Management of Science and Technology: The Johnson Presidency*.¹² In a recent interview of Robinson, however, he said it was common knowledge in Washington that Johnson preferred Illinois as the accelerator site to woo Dirksen and reward Douglas. Robinson says he was not directly involved in the decision making and could have been misled. For example, as Tape has suggested, it would have been easy to interpret AEC efforts to keep the White House informed as evidence that the President made the final decision, especially since Johnson did intervene in the agency's selection of sites to be presented to the Piore committee.

Knocking down the rumors

It is easy to see how the Douglas-Johnson and Dirksen-Johnson stories gained currency in the Washington rumor mill. Because the AEC's decision met the demands that Midwestern physicists and politicians had expressed for more than two decades, the criticism was not surprising. Moreover, among the White House watchers the suggestion that Johnson contributed to the final choice seemed consistent with the President's past performance.

Yet the written record and the participants' memories speak otherwise. Official AEC files and Johnson's Presidential papers, as well as Seaborg's own records, substantiate the oral assertions made to the author of this paper that the commissioners made the final decision without political pressure and on the evidence found in the site data and reports of various panels. The commissioners considered the site for the 200-BeV machine at 49 of their meetings between July and December 1965. They also had many discussions with members of Congress, state governments and local officials and conferred twice with the Piore committee in that period. From January through June the following year, the commissioners discussed the matter at another 39 meetings and made several site visits. When questioned about the events leading to their decision, each of the four commissioners provided details consistent with the written record and with the testimony of the others.

The record reveals that Johnson was informed of the status of decision-making from the outset and was given the opportunity to intervene—just before the site was announced on 16 December 1966. Seaborg says he sent word to the President in early December, informing him that the announcement was imminent. Word came from the White House that Johnson wanted to be informed of the choice the night before the announcement and then Seaborg was advised that the President did not want to know the AEC's decision before others were told. "Contrary to rumors that have circulated," Seaborg has written, "the President didn't exert any pressure on the AEC and left the choice of the site among the six finalists entirely to our discretion."

This does not mean, of course, that national political considerations had nothing to do with site selection. Once the site contest was announced, it acquired a political dimension. After all, a \$264-million project of whatever sort is a significant public investment. Such a project, in particular a scientific instrument that promises to bring social prestige as well as economic benefit, is likely to attract the interest of the public and, as a consequence, the attention of politicians. In the case of Fermilab, the situation was intensified by the ardent lobbying of powerful Midwestern politicians, who saw the contest as a

prime opportunity for obtaining increased Federal funding for their area and for developing a high-technology center in Illinois. From the moment of President Johnson's intervention in the site selection process in 1965, through the careful deliberations of the academy's Piore committee and the politically savvy maneuvering of the AEC commissioners, both the participants and observers recognized the importance of political considerations.

The selection also was influenced by pressures in the physics community, and such pressures, not outside factors, gave rise to the site competition. Both the URA management organization and the site selection contest were devised to help unify the physics community to support the project. By choosing Illinois, the AEC commissioners appeased Midwestern political forces as well as Midwestern particle physicists who had been campaigning for a world-class accelerator in their region for 22 years.

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