

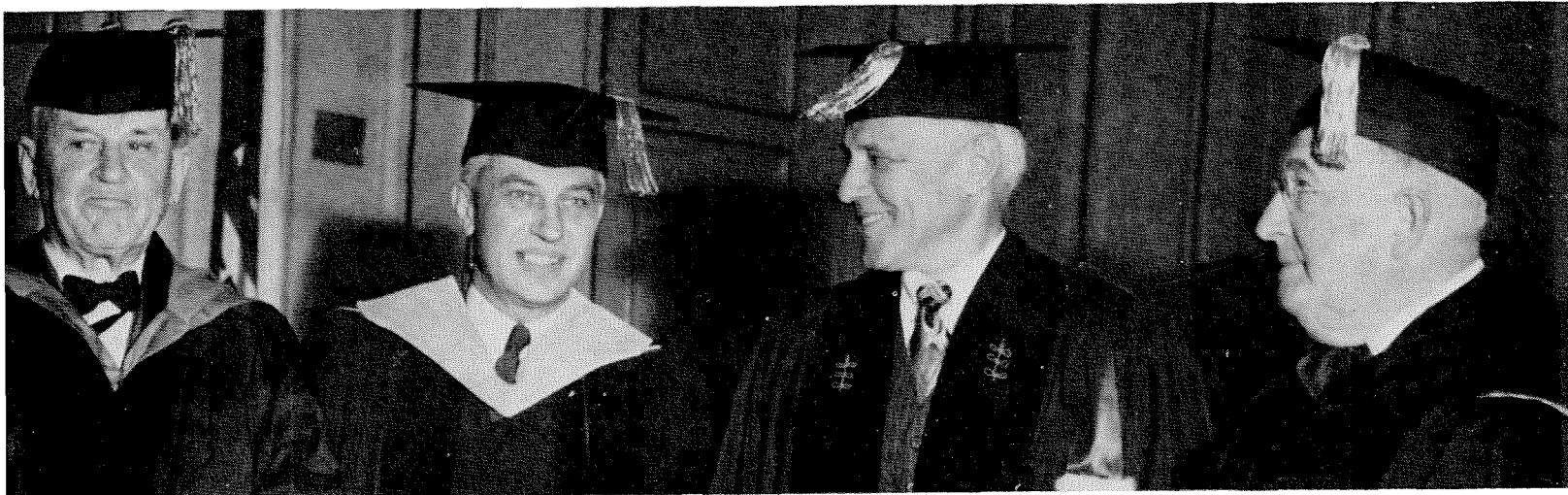
THE DuBRIDGE YEARS

FROM THE BEGINNING

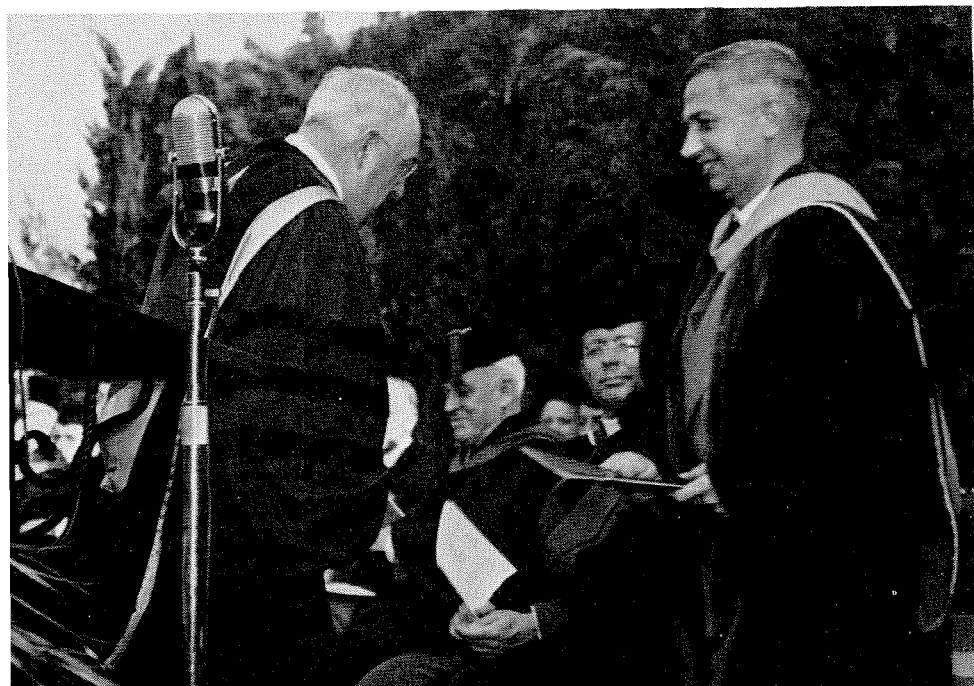
"As I take on these new duties, with humility and trepidation, I wonder if any man can help but be appalled at the task of running any educational institution these days."

Lee A. DuBridge was speaking from the stage of the Pasadena Civic Auditorium on November 12, 1946, at the first presidential inauguration ever held by the California Institute of Technology—his own.

It was not Lee DuBridge's first association with Caltech. In 1926 he had come here as a National Research Council Fellow to work for two years with the great physicist Robert A. Millikan—the man he was now replacing as chief administrator of the Institute.



1946—Lee DuBridge is inducted as Caltech president on November 12. With him are his predecessor (1921-46) Robert A. Millikan; MIT President Karl T. Compton; and James R. Page, chairman (1943-54) of Caltech's board of trustees.



1947—Chairman of the Board James Page turns the podium over to DuBridge at his first Caltech commencement.

The years between had been productive. In 1928 DuBridge joined the physics faculty of Washington University in St. Louis; in 1934 he became chairman of the department of physics at the University of Rochester; and just before the outbreak of World War II, in 1940, he was chosen to serve as director of the new Radiation Laboratory being established at MIT to develop radar for the military—a project that played a crucial role in the successful outcome of the war.

When DuBridge came back to head Caltech in 1946, his immediate task was to move the Institute out of its war-oriented program of secret military projects back to its fundamental scientific interest. He had to face the problems of an unprecedented enrollment (from 962 before the war to 1,391 after), overcrowded classrooms, insufficient housing, and overtaxed instructors. And the funds had to be raised “to build on existing foundations an institu-

tion which will more perfectly serve the needs of a changing world.”

From the beginning—and all through his 22-year presidency—Lee DuBridge stated his commitment to the concept of a small, select institution offering excellence in education. Facts and figures are only part of the story, but the statistical record of change during the DuBridge administration is an impressive indication of how he has held to that concept.

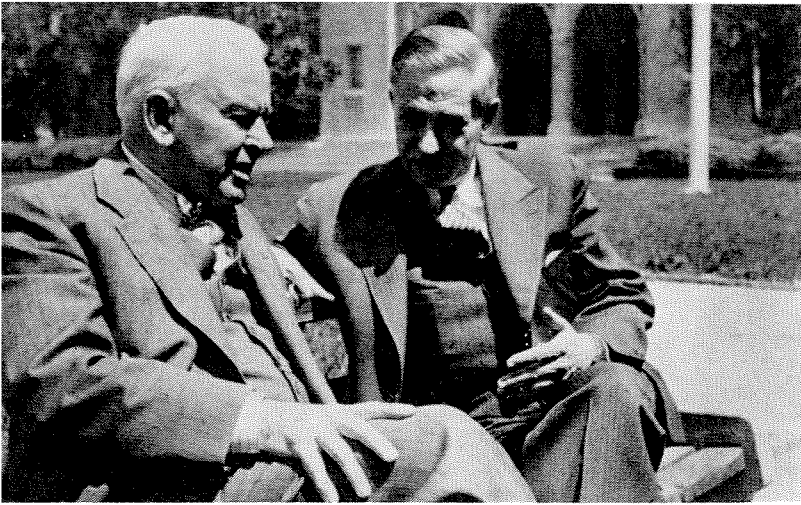
The 30-acre campus of 1946 has grown to 90 acres; the \$17 million endowment is now over \$100 million; the faculty of 260 is now 550; the number of campus buildings has increased from 20 to 64; and the budget has gone from something under \$8 million to \$30 million. But enrollment has remained relatively constant. In 1946 the total number of students, graduate and undergraduate, was 1,391. Today it is 1,492.



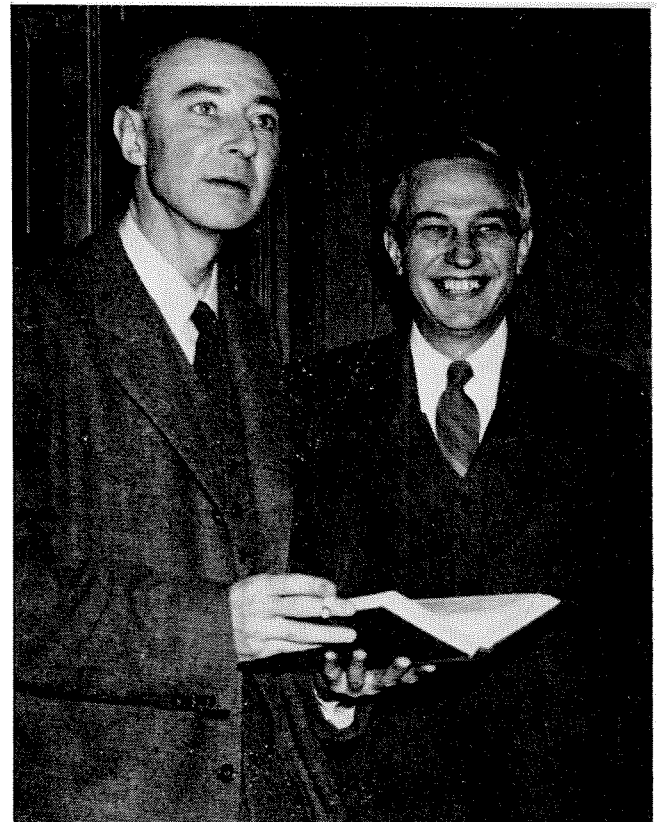
1947—The new president poses for his first official portrait.



1947—For incoming freshmen (then, as now) this is the high point of New Student Camp—a chance to talk to the president.



1951—Millikan and DuBridge have an informal conference. Millikan died in 1953, six years after DuBridge became president.



1950—Robert Oppenheimer, director of the Institute for Advanced Study in Princeton and a former Caltech professor, returns to the campus to lecture on the elementary particles of physics.



1954—DuBridge, Chairman of the President's Science Advisory Committee (just one of the major jobs he will do for President Nixon), meets with Ike in Washington.

SPOKESMAN FOR SCIENCE

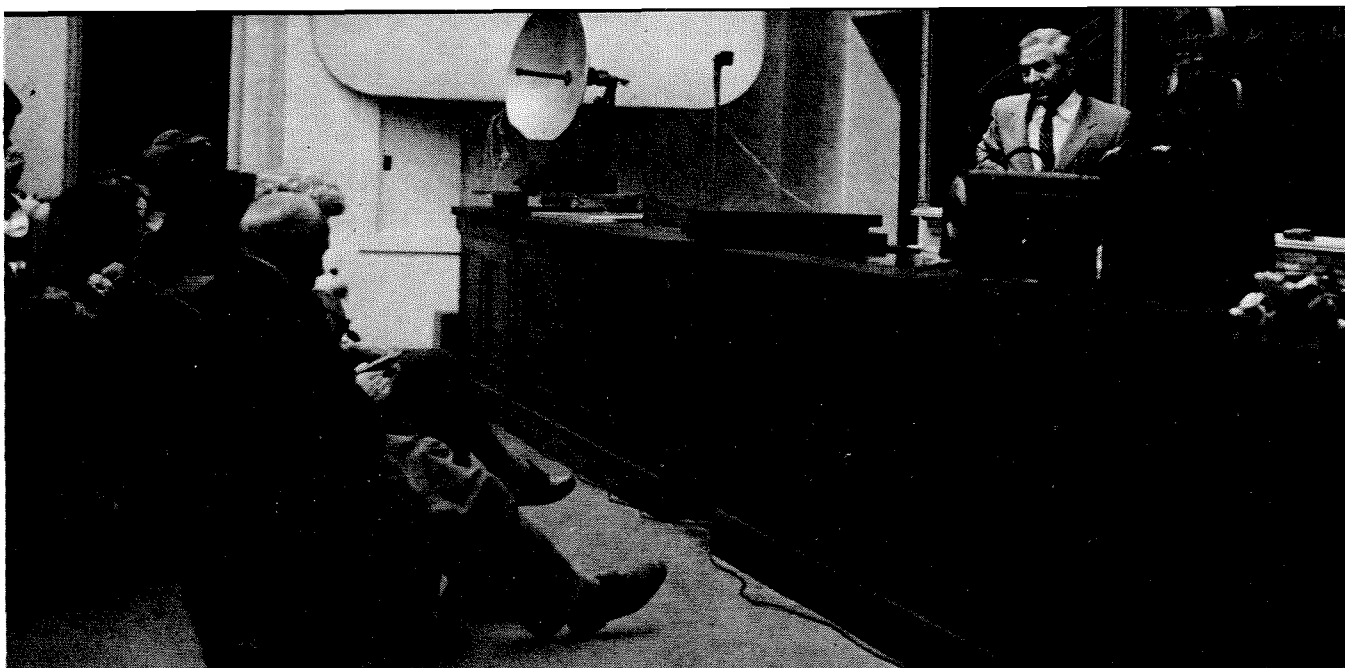
"It is tragic that the goals of science are so little understood . . . that it is regarded as a mysterious category. Science is merely one path to greater understanding."

Lee DuBridge has spent much of his life trying to dispel the public misconception of the role of science in the overall human endeavor.

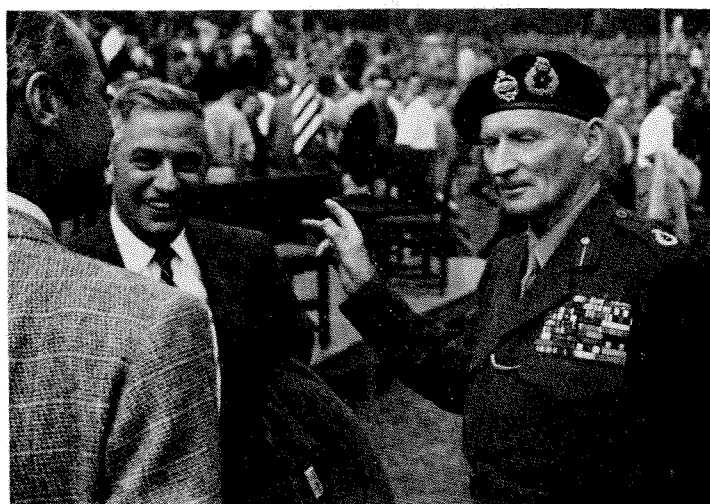
He has been the champion of science and technology at every opportunity. And his opportunities have been many. He has carried the word to industry, to the government, to the business community, and to the people—to civic groups, institutions, committees, commissions, and boards. In his 22 years at Caltech he has made more than 500 formal speeches, served on 32 boards and 31 committees, and traveled by air a distance roughly equal to three and one-half round trips to the moon.

Some Milestones

- 1946 Lee A. DuBridge inaugurated as president of Caltech.
- 1948 200" Hale telescope dedicated at Palomar Earhart Plant Research Laboratory completed Graduate program in astronomy initiated Tournament Park bought
- 1949 Guggenheim Jet Propulsion Center opens Tuition raised from \$500 to \$600
- 1950 Thomas Engineering Laboratory completed Merrill Wind Tunnel dedicated Air Force ROTC unit established on campus
- 1951 60th anniversary of Caltech Industrial Associates formed Billion-volt synchrotron goes into operation Edwin M. McMillan, '28, MS '29, receives the Nobel Prize in Physics President Truman appoints DuBridge to the Science Advisory Committee
- 1952 Geochemistry established as a field of research
- 1953 Robert A. Millikan dies



1955—DuBridge gives a Friday Evening Demonstration Lecture on radar. During World War II he led the development of radar at MIT.



1954—Field Marshal Viscount Montgomery, British World War II hero, visits Caltech to address the faculty and students in Tournament Park.

IN DEFENSE OF ACADEMIC FREEDOM

“If there is any area of human activity which flourishes only in an atmosphere of freedom, it is the area of creative science and technology . . . Freedom—private initiative—that is the first prerequisite for a virile technology.”

When Lee DuBridge moved from wartime research back to the academic world, he carried his convictions about academic freedom into the era when Joseph McCarthy and his supporters were extinguishing it wherever they could—and university faculties were among their chief targets. DuBridge consistently championed this freedom, and most particularly on his own campus.

In 1953 he wrote: “Academic freedom is a privilege granted to a teacher by his university . . . (the privilege) to retain his position in the university

even though he expresses opinions or beliefs, or makes statements, or engages in activities which are unpopular with the public or at variance with opinions of his colleagues, or of the university administration, or its governing board . . . Every leading university in the United States has assured its faculty of this privilege. Thereby the progress of learning has been accelerated and assured—to the eternal benefit of civilized living.”

He gave even more specific voice to these beliefs in April 1954 when he testified in Washington before the Personnel Security Board of the United States Atomic Energy Commission in support of his colleague Robert Oppenheimer. And, during the long years when the chairman of Caltech’s chemistry division, Linus Pauling, was under fire for his political convictions, DuBridge—against a growing storm of criticism—solidly defended Pauling’s right to that freedom.

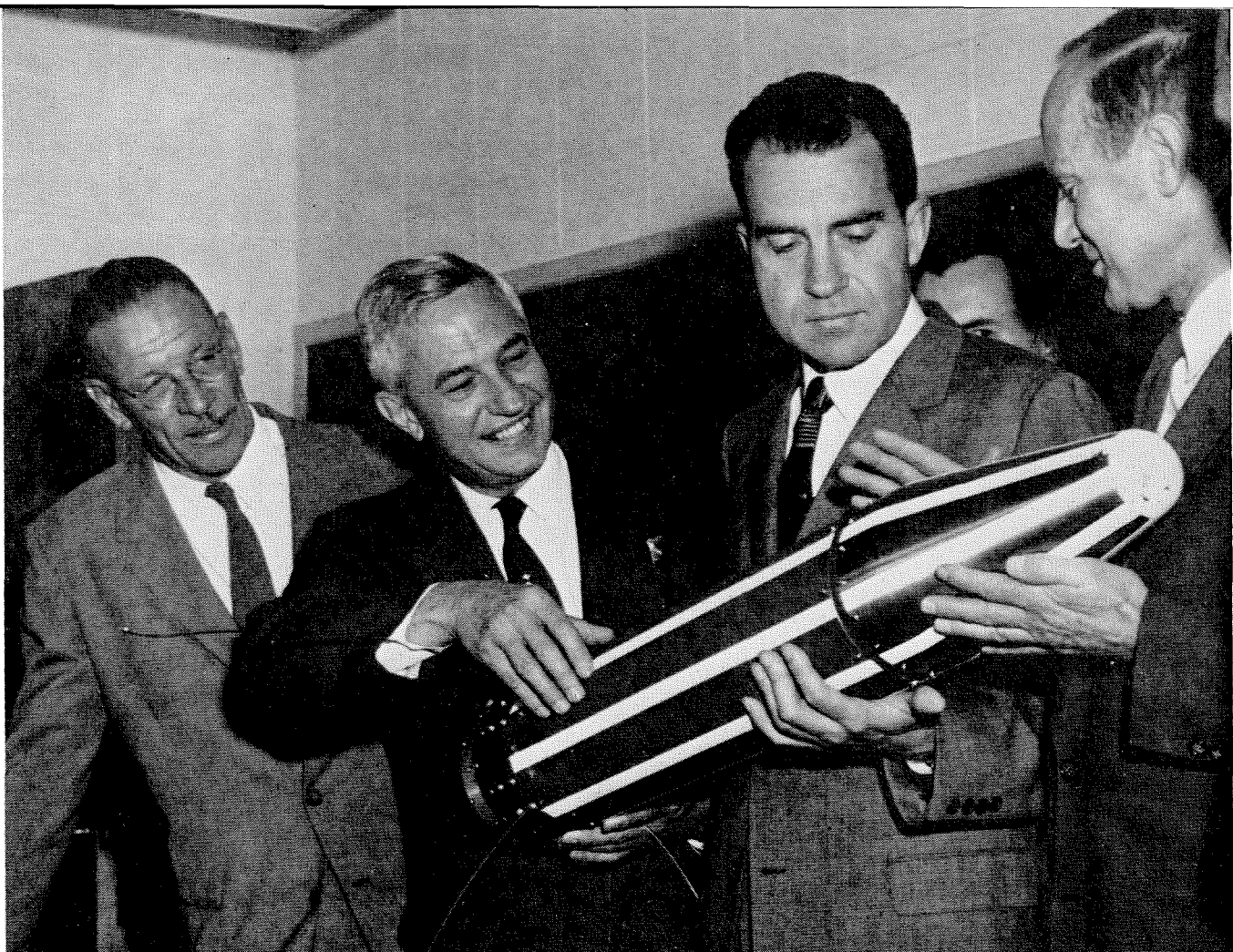


1958—DuBridge and Alumni Secretary Donald S. Clark kick off Caltech's first big (\$19 million) development campaign with phone calls to alumni all over the country.

1955—*Time* thinks DuBridge, at 53, can "justly claim the title, Senior Statesman of Science."

1957—DuBridge with undergraduates on the campus. In 1957 there were 676 of them; today there are 722.





1958—Vice President Nixon, on a five-day visit to California, inspects a model of an Explorer satellite—the USA's first spacecraft—along with Clark Millikan, DuBridge, and JPL chief William Pickering.

IN SUPPORT OF SCIENCE

“The exploration and the support of science for its own sake is not being adequately—certainly not generously—supported . . . Billions are being spent on military and industrial technology, but the amount spent on science can be measured in a small number of millions per year.”

This was the plea that Lee DuBridge took with him everywhere in seeking support for the Institute.

Caltech's first fund-raising drive was launched in 1958—a \$19.5 million development program—and its success accounted for 18 new buildings, a faculty salary increase, and other improvements.

In 1959 President DuBridge expressed the hope that the sources of support for education and research would retain the relative positions of 30 percent from endowments, 30 percent from gifts, 30 percent from government, and 10 percent from tuition. While always explicit about the importance of this balance, he continually stressed that the total

amount of support must be increased. With this conviction as an impetus, a second campaign was initiated in 1967, with a goal of \$85 million to be raised over a five-year period. As DuBridge leaves, the campaign has reached 36 percent of its goal.

Some Milestones

- 1954 Linus Pauling receives the Nobel Prize in Chemistry
- 1955 Scott Brown Gym and Alumni Swimming Pool open
Norman Church Laboratory for Chemical Biology completed
Tuition raised from \$600 to \$750
- 1956 William Shockley, '32, receives the Nobel Prize in Physics
- 1957 Eudora Hull Spalding Laboratory of Engineering opens
Archibald Young Health Center completed
\$19.5 million development program launched
Donnelley Seismological Laboratory opens
Tuition raised from \$750 to \$900
- 1958 George W. Beadle receives the Nobel Prize in Medicine
Explorer I launched



1959—DuBridge reminisces with Orrin Smith, the Cornell College professor who inspired him to become a physicist.

1962—DuBridge leads Theodore von Karman, Clark Millikan, and former Secretary of the Navy Dan Kimball through Caltech's newly dedicated Karman Laboratory of Fluid Dynamics and Jet Propulsion.



WHERE THE ACTION IS

"Remember that you are a part of a glorious institution. Caltech is really a fabulous place. Caltech is at the center of what is going on; it is where the action is."

Lee DuBridg e was speaking to the brand new freshman class of '72 at New Student Camp this fall. And he was saying what he has always believed—that Caltech is a great place to be. He said it when he first came here, and he was still saying it with undiminished pride and enthusiasm in what now turns out to have been his final formal talk to Caltech freshmen.

"You name the field," he said, "and Caltech is there. Caltech is not only there, but Caltech may have pioneered that field. Basic supersonic aerodynamics started here. The study of cosmic rays started here. The discovery of the alpha-helix of the protein molecule started here. Modern rockets began here. Molecular genetics started here. Modern seismology started here.

"The 200-inch telescope is here, and so are a dozen other unique astronomical instruments. For 60 years Pasadena has never had only the *second*

largest telescope; at one time it had the largest, the second largest, and the third largest!

"Nuclear structure, the nature of DNA, the biological role of proteins and enzymes, the structure of the center of the earth are all concepts and subjects which have been pioneered here. What makes a star shine? How were the elements created? What is a quasar? A pulsar? Who saw the first positron? the first meson? Who proposed the expanding universe? Ask someone at Caltech.

"But this is all past history: Are we just sitting on the glories of past achievements? Let's look around.

"Does anyone know any more about nuclear reactions in stars, or has anyone added so much to our knowledge, as William Fowler? Carl Anderson still heads the physics division though he earned the Nobel Prize over 30 years ago for discovering the positron. If anyone knows any more about nuclear theory, gravitation, quantum electrodynamics, color vision, or freshman physics than Richard Feynman, no one has found him.

"The founders of molecular genetics were George Beadle and Max Delbrück. Max is still here and has been joined by Robert Sinsheimer, James Bonner, Ray Owen, and a few others.

1962—Richard Nixon, running for Governor of California, makes a campaign appearance at Caltech.



“Linus Pauling proposed the modern theory of the chemical bond, and he and Robert Corey discovered the basic protein structure, the alpha-helix. Pauling has gone and Corey has just retired, but their students and followers, John Roberts, Richard Dickerson, Harry Gray, and George Hammond, keep Caltech in the chemical forefront of the world.

“Beno Gutenberg founded modern seismology. Charles Richter learned how to put numbers on earthquakes. Some younger followers, Clarence Allen and Don Anderson and others, keep the seismo lab a lively place. Gerald Wasserburg and Leon Silver elucidate the earth’s history, and Robert Sharp tells us of the geology of glaciers and of Mars.

“Are more practical matters of interest to you? I hope so, for I trust that half of you may end up being engineers and putting scientific knowledge to use for the benefit of people. Airplanes? Ask

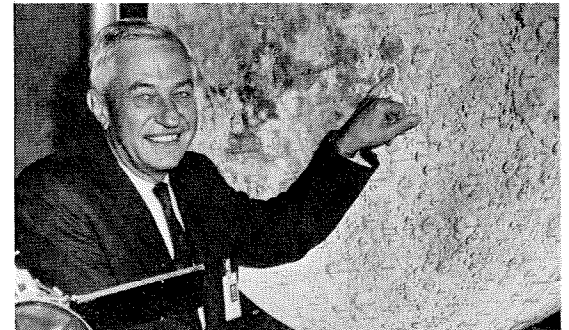
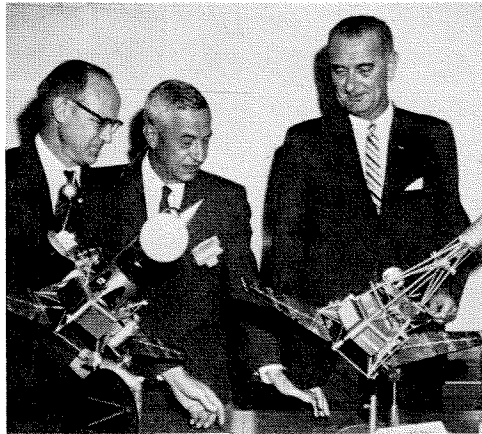
Ernest Sechler, Hans Liepmann, Lester Lees. Lasers? Transistors? Plasma? Ask Robert Langmuir, Roy Gould, and Charles Wilts. Earthquake-resistant structures? Ask George Housner and Donald Hudson. Metals and alloys? Ask Don Clark, Pol Duwez. Computers? Ask Gilbert McCann. Smog? Ask Arie Haagen-Smit and Jack McKee. Sewage disposal? Ask Norman Brooks. I could go on and on.”

DuBridge spoke with the same fervor on December 10 in Beckman Auditorium, when he said farewell to the Caltech community.

“I thought in 1946 and I still think that Caltech is the most wonderful place in the world to be.”

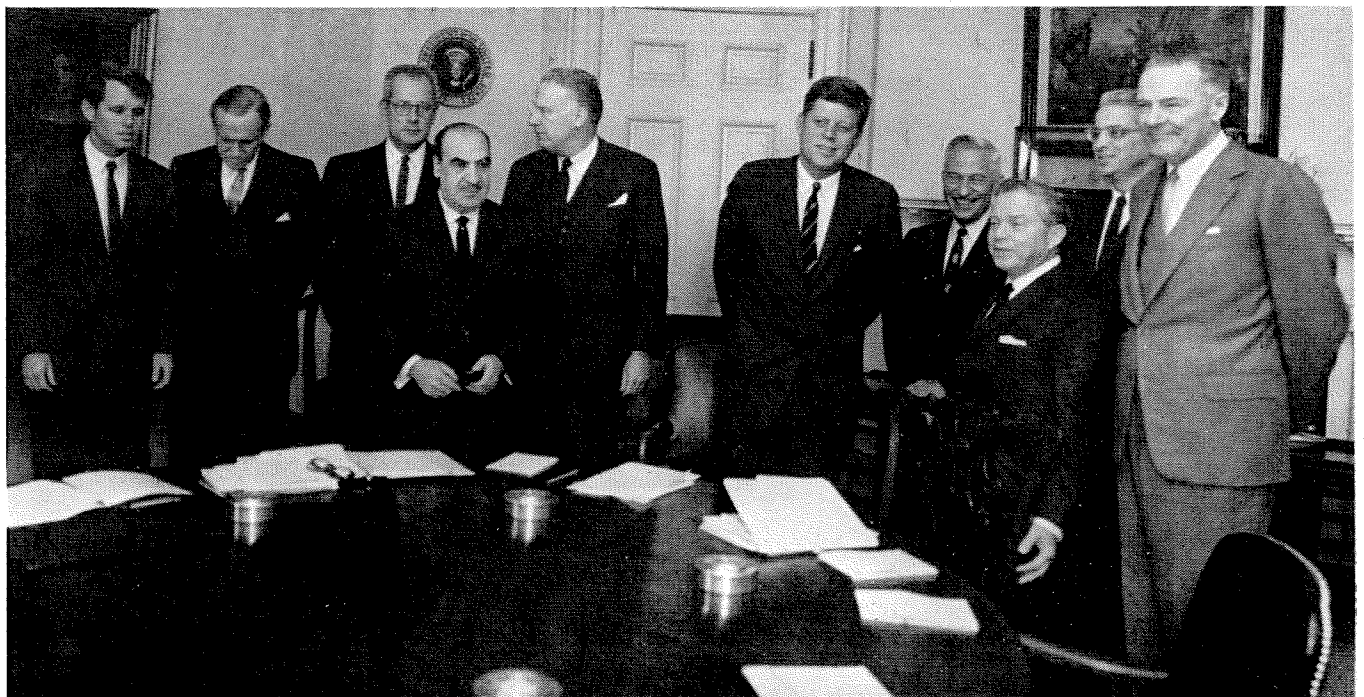
This tribute to Caltech is, perhaps, a fitting tribute to himself, for Lee DuBridge has written some of the most important chapters in the history of this “most wonderful place.”

1963—As the space age gains momentum, JPL becomes the place to see. Pickering and DuBridge show Vice President Johnson models of the moon-photographing Ranger spacecraft.



1965—A jubilant DuBridge points out the impact area of Ranger IX on a lunar map after the spacecraft’s successful moon flight.

1963—At a meeting of the Distinguished Civilian Service Awards Board, DuBridge is flanked by Attorney General Robert Kennedy; Deputy Secretary of Defense Roswell Gilpatric; Secretary of Labor Willard Wirtz; Secretary of Health, Education and Welfare Anthony Celebrezze; Under Secretary of State George Ball; President John Kennedy; publisher Samuel Newhouse; Civil Service Commissioner John Macy; and UN Ambassador Henry Cabot Lodge.





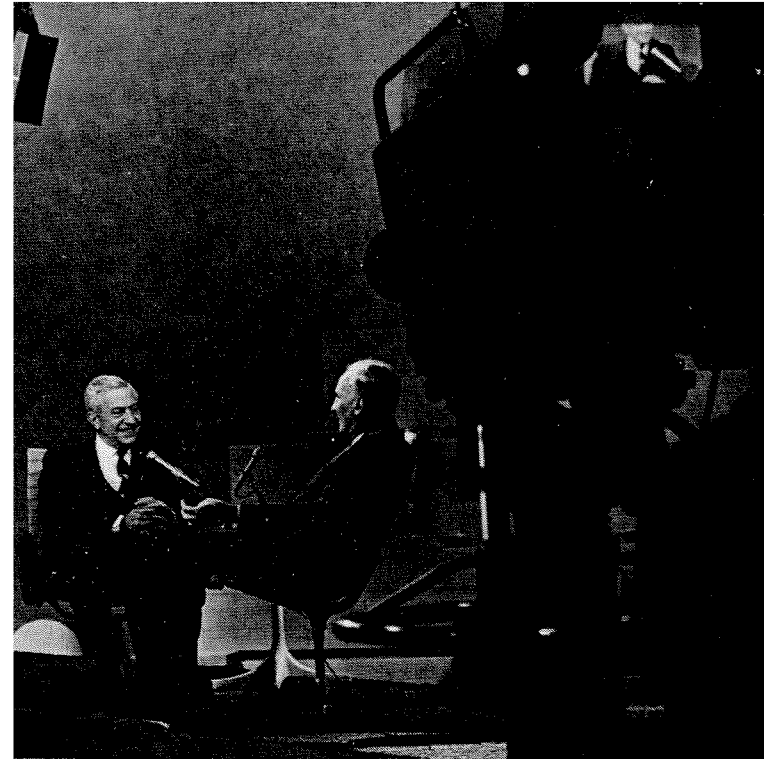
1966—DuBridge and Chairman of the Board Arnold Beckman (in the row behind him) watch tensely as JPL's Surveyor I makes its perfect descent to the moon's surface.



1965—DuBridge escorts a royal visitor, Princess Margaret, down the Olive Walk.

Some Milestones

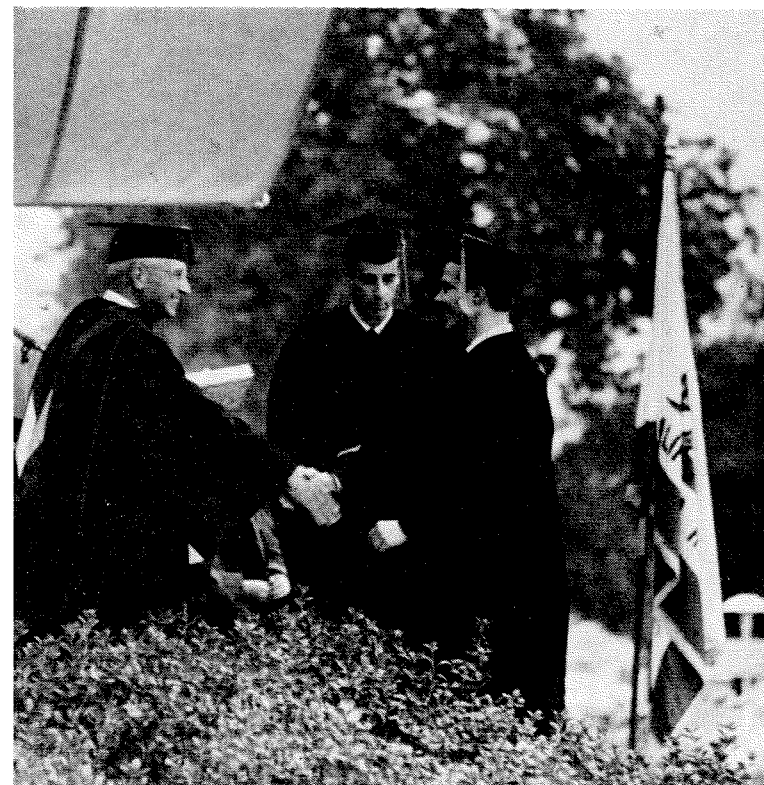
- 1959 Two 90-foot radio antennae begin operating at Owens Valley Radio Observatory
Goldstone tracking station established by JPL
Tuition raised from \$900 to \$1,275
- 1960 Donald A. Glaser, PhD '50, receives the Nobel Prize in Physics
Alfred P. Sloan Laboratory of Mathematics and Physics opens
W. M. Keck Engineering Laboratories completed
Page, Lloyd, and Ruddock student houses occupied
Alles Laboratory for Molecular Biology completed
Harry Chandler Dining Hall opens
Cooperative Wind Tunnel closes
- 1961 Rudolf Mössbauer receives the Nobel Prize in Physics
Karman Laboratory completed
- 1962 Four new graduate student houses open
Winnett Student Center dedicated
Firestone Flight Sciences Laboratory completed
Mariner II launched
- 1963 Willis H. Booth Computing Center dedicated
PhD program in applied mathematics initiated
Option in planetary science introduced
Tuition raised from \$1,275 to \$1,575
- 1964 Charles H. Townes, PhD '39, receives the Nobel Prize in Physics
Ranger VII launched
Beckman Auditorium dedicated
- 1965 Pass-fail system for grading freshmen adopted
Richard Feynman receives the Nobel Prize in Physics
Options in the humanities offered
Steele Laboratory of Electrical Sciences completed
Tuition raised from \$1,575 to \$1,800



1967—Dr. DuBridge's support of innovation in education resulted in his involvement with National Educational Television and his appointment as chairman of the board of KCET in Los Angeles. Here he and Caltech trustee Simon Ramo discuss "Science and Society—A Race Against Time" on a program for the Los Angeles station.



1967—DuBridge and Beckman launch Caltech's \$85 million "Science for Mankind" development campaign. DuBridge delayed his retirement to get the fund drive started.



1967—In his 22 years at Caltech, DuBridge has congratulated more than 8,000 graduates and sent them off into the world.



1967—One president shakes hands with another—student body president Joe Rhodes, the first sophomore elected to that office.



1967—DuBridge, grandfather of five, makes an experienced Santa at the annual Athenaeum Christmas party.



1966—A quiet dinner turns out to be—to his surprise—a party at which 500 faculty and friends fete his 20 years as Caltech president. Mrs. DuBridge is ready with smelling salts.

SPECIAL ASSISTANT TO THE PRESIDENT

“Science and technology are now essential elements of national concern and national policy It is imperative that ways be found to continue to bring scientists and engineers into policy-making and policy-advising positions in even more intimate and extensive ways”

These convictions have led Lee DuBridge from Caltech to his appointment as Special Assistant to the President for Science and Technology.

It is a job for which he has had extensive preparation. In 1951 President Truman appointed him to the government’s new Science Advisory Committee, established to maintain contact between the federal government and the scientific community. The next year President Eisenhower asked DuBridge to become chairman of that committee, a job he held until 1958 when the responsibilities were expanded into a full-time position.

Now, two administrations later, in that full-time role, DuBridge will have three major responsibilities. As adviser to the President he will consult with the chief executive on the coordination and adoption of policy necessary to a healthy growth of science and technology and to the welfare of the country. As chairman of the Federal Council on Science and Technology he will coordinate the array of scientific activities of the government. And as chairman of the Science Advisory Committee he will call on the best scientific minds in the country to help solve the national problems involving scientific matters, from nuclear energy to education and research in the universities.

In addition to his experience as a physicist, research director, educator, and administrator, Lee DuBridge takes to Washington a nationwide reputation as “Senior Spokesman for Science.” He will bring all these to bear on the problems of strengthening science and education in this country. □

Some Milestones

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| 1966 | 75th anniversary of Caltech
Surveyor 1 makes a soft landing on the moon
Division of the Humanities becomes The Division of the Humanities and Social Sciences |
| 1967 | Robert A. Millikan Memorial Library dedicated
\$85 million development campaign launched
Surveyor III makes elaborate soil tests on the moon |
| 1968 | Noyes Laboratory of Chemical Physics opens
Proposal to admit women undergraduates passed
Tuition raised from \$1,800 to \$2,100 |