

Becoming Caltech

In 1920, when the Throop College of Technology became the California Institute of Technology, more than just its name changed.

On February 10, 1920, the Board of Trustees of what was then the Throop College of Technology (pronounced Troop) changed the name to the California Institute of Technology. Just over two months later, on April 13, the California secretary of state certified that the name-change petition had been officially filed in his office, completing the legal process.

If it had simply been a name change, there might be little reason to mark that occasion today. After all, Caltech's origins trace back to its founding in 1891, and it had changed its name twice previously, from Throop University to Throop Polytechnic Institute and then Throop College of Technology.

But the 1920 name change was a signal of something much more significant: a fundamental change in focus. Caltech not only amended its name but its student body as well, adding graduate students. This represented a move from teaching knowledge to creating knowledge, which transformed this regional manual-arts school into what would become an internationally renowned scientific-research institution. The name change was the first step in an evolution that has guided the Institute ever since.

Then (from top): The “Dugout” fireplace in the Student Center, 1924; chemistry lab in Gates, 1921; demonstration in High Volts, c. 1930. Now (from top): Students outside the Red Door Marketplace; in the lab of chemical engineering professor Mikhail Shapiro; the Mars Science Laboratory Mission’s Curiosity rover.

A Q&A with Caltech Archivist Peter Collopy

A new exhibit put together by the Caltech Archives, Becoming Caltech: Building a Research Community, 1910–1930, showcases the decades before and after the Institute’s transition from Throop College to the California Institute of Technology.

What is the scope of *Becoming Caltech*?

In the exhibit, we focus on the transformation of the institution in two periods. The first started in the late aughts, around 1908, when there was a really deep rebuilding of the Institute from one that had tried to be many things to many people in Pasadena to one that was very specifically and narrowly an engineering school. The second period begins when that engineering school, which lasted in that form for about a decade, was successful enough that its leadership decided it could expand to be a scientific institute as well.

One section of the exhibit features the architecture of the campus during this period. This was when many of the original buildings were constructed: from what was originally Pasadena Hall (which then became Throop Hall, the central building on campus until the 1970s) to the Athenaeum, which was dedicated in 1930. Many of the core scientific or laboratory buildings were also added to campus during this period: Gates for chemistry, Bridge for physics, Kerckhoff for biology. As each of these



disciplines was established in the late teens and early '20s, an architectural history developed with them.

Through the exhibit, the Caltech Archives also captures the history of science during this period, which is largely the story of the establishment of chemistry, physics, geology, and biology, and their scientific leaders. Robert Millikan, the most prominent American physicist of his time, and Thomas Hunt Morgan, maybe in the top two or three most prominent American biologists of his time, came to Caltech and built research apparatus around themselves.

Was there anything that surprised you about the earliest days of the Institute?

How central World War I was to the Institute is really striking to me. There was interest from people like George Ellery Hale in making Throop a more professional, scientific, research-oriented institution throughout the teens, but what brought the resources together and what brought the people together who could really make that happen was the level of collaboration among scientists demanded by a war. It's not a new observation among historians of science that war leads to new collaborations, the development of new disciplines. It leads scientists to refocus their efforts on different problems than they had been focused on in peacetime, but the extent to which that provided the opportunity for the founders of Caltech to rebuild the Institute has been really remarkable.

Becoming Caltech *will remain on display in Beckman Institute 131 through December 23, 2020. Learn more at library.caltech.edu/becoming-caltech.*

Insights into Caltech History

Speeches and correspondence that span more than 80 years recently gathered from the Institute's Archives reveal how significant figures in Caltech history perceived the Institute's place in the world.

George Ellery Hale (1868–1938)

Already a member of Throop Polytechnic Institute's governing board, astronomer Hale convinced the trustees to dramatically change the school and its mission. In a 1908 letter to James A. B. Scherer, who would soon become Throop's president, Hale laid out a vision for what would become the modern Caltech.

"It certainly seems feasible to educate men broadly and, at the same time, make them into good engineers. In my opinion, the man who [does so] will make a contribution of the highest importance to educational methods. I believe the principal technical schools of the country will be forced to do this thing before many years have passed, and the institution that sets the pace will benefit greatly."

Thomas Hunt Morgan (1866–1945)

Morgan, a renowned biologist who would receive the Nobel Prize in Physiology or Medicine in 1933, included a budget mindful of all the components needed to establish Caltech as a leader in the biological sciences in a 1927 letter to Hale.

"The proposed budget of \$80,000 should give us a good start. ... Nevertheless, I shall hope to persuade the Trustees to let us put aside enough of it to pay the car fares for the men and their families who go to Woods Hole (or elsewhere) for work during the summers. Here we have a unique situation, where all the biological world comes together. Such contacts should be of prime importance if our group is to go forwards and keep in the first rank."

Martin Luther King Jr. (1929–1968)

In February 1958, the Rev. Martin Luther King Jr. visited Caltech as part of the Caltech Y's Leaders of America program. After his three-day visit, King sent a letter of thanks to the Caltech Y for its sponsorship.

"As I said riding to the airport the other night, I was quite pleased in knowing that students in scientific research were so interested in social problems. This, it seems to me, is very promising and it is certainly all important as we think of the fact that our scientific and technological progress has so far outdistanced our moral and spiritual progress."



Lee Alvin DuBridge (1901–1994)

Launched on February 17, 1965, NASA's Ranger 8, which was designed by JPL, took more than 7,000 images of the moon before it was retired on February 20. The first secretary of the U.S. Department of Health, Education and Welfare, Oveta Culp Hobby, sent then-Caltech president DuBridge a telegram that read, "Hooray, the moon is now an old friend." DuBridge responded to the congratulatory telegram in a letter.

"All of us here are very pleased with this new Ranger success, and we are becoming old friends with the moon. It has occurred to us that we really won't be sure that the moon isn't made of green cheese until we can reach out and pick up a handful of lunar firma. But this day is not far off."

Harold Brown (1927–2019)

Brown, Caltech's president from 1969 to 1977, implemented equal-opportunity programs and opened Caltech to female undergraduates. Brown reveals his thoughts on co-education at the Institute in a March 1990 interview.

"There had been a decision, in principle, to admit women as undergraduates. The trustees had approved that but had made it conditional upon the building of new student houses for women, which would take at least two years. I concluded that it was not a good idea to wait that long, and I pressed rather hard for an arrangement that would set aside corridors for women in the existing student houses. A good many of the trustees were very reluctant to do that, strange as it may seem in 1990—but that was 1969. Essentially, they did it because I made bringing in women in 1970 an issue of confidence in me."

Brown said he pushed for their swift inclusion "very hard. In retrospect, I think it was the right thing to do."

"It had always seemed to me that it was up to Caltech, for its own good as well as the good of society, to encourage those who reached the point of college admissions to go to as good a place as they could. And Caltech was such a place. Moreover, there is a certain positive effect—not enough, but some—in having women



Then

The "Old Dorm," with a view toward the San Gabriel Mountains.

Now

The Hameetman Center, Caltech's new community center, which was dedicated in February 2019.



who go to Caltech become role models who could reach down and help offset some of the biases that work the other way.”

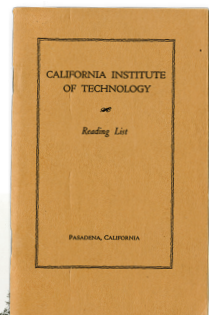
Frances Arnold (b. 1956)

Arnold, awarded the 2018 Nobel Prize in Chemistry, addressed the campus community after the prize announcement and spoke in part about the role Caltech played.

“We’re celebrating a small and very special institution that made it possible for me to do the work that led to the Nobel Prize. ... Only here could I convince students from very different disciplines—engineers, chemists, biochemists, molecular biologists, computational scientists—to throw their hat into this kooky ring and this completely unexplored field, and really contribute their creativity to this idea that you could breed proteins like you breed cats and dogs. And only here would I have been challenged to solve ever harder problems.”

Then + Now

Below far left: English Professor Clinton Judy’s Reading List, c. 1927. Below left: Commencement in front of what is now Parsons-Gates Hall of Administration, 1923. Below right: Each year, before commencement, the graduates gather in front of Parsons-Gates for a group photo. Facing page, left: Engineering professor Arthur Klein in the 10-foot wind tunnel. Facing page, right: Students conducting research in the Center for Autonomous Systems and Technologies. Facing page, below: From the Caltech Flags Collection.



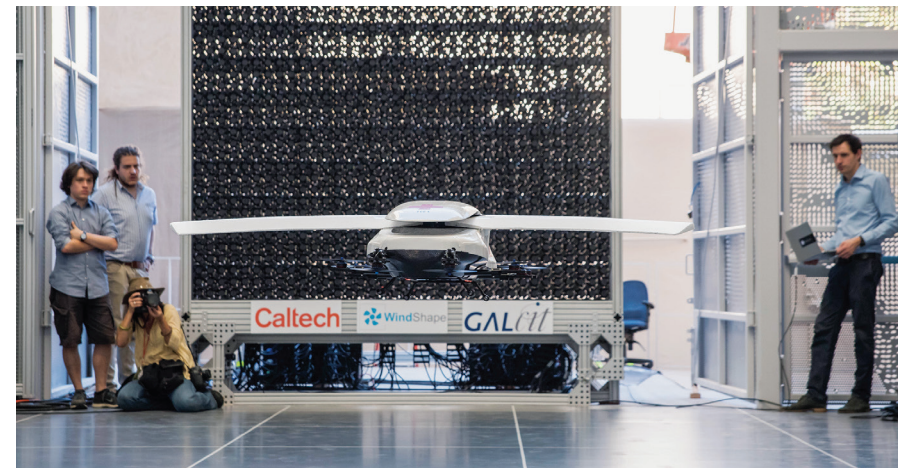
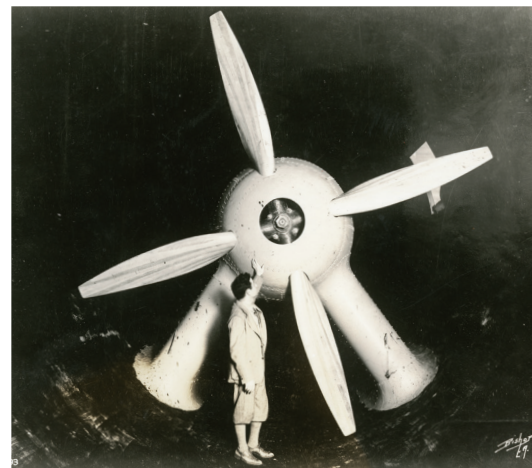
Caltech’s President and Provost on Caltech’s Evolution

President Thomas F. Rosenbaum and Provost David A. Tirrell recently sat down for a conversation about the Institute’s first century of research and discovery as Caltech. They discussed how the 1920 name change reflected a decision to focus the Institute’s resources on science and engineering, how that decision has shaped Caltech’s success over the last century, and how it is being woven into their vision for the future.

David A. Tirrell: I think Caltech has always both addressed fundamental questions that are driven by curiosity about the nature of the physical world and taken account of the pressing questions of the day. This was certainly true with respect to our participation in the development of the aerospace industry and the Jet Propulsion Laboratory [JPL], and, more recently, in setting up the Resnick Sustainability Institute [RSI].

I think the RSI provides a striking example of that outlook. To understand the climate is an enormous intellectual challenge, but, at the same time, doing so is essential if we are to address an important societal issue. I think that Caltech’s ability to balance those two kinds of considerations and, in particular, to maintain a focus on the fundamentals while most external influences would push the Institute in the other direction, is important to its overall success.

Thomas F. Rosenbaum: One of the striking aspects of the modern founders of Caltech involved the risks they took at the beginning. They had the courage of their convictions. They saw that there were opportunities in science and



technology in Southern California at that time, and they completely switched the orientation of the Institute, focusing its mission and shrinking its size drastically, even to the point where it might not have continued to exist.

We retain the strong interactions between individuals, the lack of bureaucracy, the fact that faculty have a sense of what their colleagues are doing, that divisions are broad, that institutes connect between divisions. This all depends on not growing too big. It means you can’t do everything. That’s the cost. But it does permit us to do things in a different, supple, flexible way that other institutions simply can’t. I think it’s really important to maintain this advantage.

Tirrell: Maintaining our small size seems to be a commitment broadly shared by the Caltech community. At the same time, there are some things that we’ve done on a very large scale: large telescopes, LIGO. We balance small size against extraordinary investments in certain areas, and that’s a tension that I think has served Caltech well, one that demands constant thought about where we want to be small and where we need to scale up in order to do something important.

Rosenbaum: Yes. We’re trying to understand, given the close connections between the disciplines at Caltech, how we can make a contribution in the way that only Caltech can. And, in order to do that, you have to hire people who are fearless and who want to grapple with these gray areas, and you have to provide resources that let them take risks. You have to cast your net broadly.

Talent is distributed among people from every country, every ethnicity, among men, among women. If Caltech is going to compete, it needs to be a destination for the most creative, original minds across the world, but it also needs to be an environment where people then bring those different perspectives together to create knowledge. I

consider diversity central to our sustainable existence as a leading research university.

Tirrell: This is an area where we need to constantly reexamine our practices. I believe a frank analysis would suggest that we have to continue to look for more effective ways to approach the challenge.

To start with, we need to be sure that we’re talking with the communities that are not yet fully represented at Caltech. We need broad conversations with people who can tell us about their first-person experiences and guide us to more effective practices.



Rosenbaum: I absolutely agree. In addition, we have to address some of the related issues that we face, including the free movement of people and ideas. Forty-five percent of our faculty were born outside the United States; almost 50 percent of our graduate students are international. The Institute has benefited enormously from people

coming from around the world to join us. That historical advantage is becoming more difficult to sustain.

There is also the question of creating an environment where people can exchange ideas on all subjects. I think that it’s extraordinarily important to continue to create an environment where you get a vibrant clash of ideas. The other challenge we have is to make sure that we can continue to provide seed funds that allow people to follow their dreams, to have great ideas and then try them out. Trying risky ideas is something that I think we do well, but it takes substantial resources.

Tirrell: Yes. Caltech is an extraordinary place because of the unusually talented people who work and study here. Our colleagues want to be part of this community primarily because they want to work with each other. Our most important challenge is to make sure that we continue to attract extraordinary people: staff, students, and faculty. [C]

The above is an edited excerpt from a longer conversation. To read more, visit magazine.caltech.edu/post/caltech-evolution.