AMOS GAGER THROOP

FOUNDER OF CALTECH

FROM CALTECH’S ARCHITECTURAL HERITAGE

BY ROMY WYLLIE
Caltech's Architectural Heritage

Romy Wyllie
Today Caltech is at an architectural crossroads. We have hired one of the world’s great architectural firms, Pei Cobb Fried and Partners, to design a new building which will act as a cornerstone of the North Campus. James Freed is proposing ideas that could take the campus look in subtly new directions. His work should symbolize the optimism the campus feels about the future opportunities opening to Caltech in science, engineering and other aspects of intellectual and artistic life. This is a wonderful time to look back and see where our roots lie.

Romy Wyllie has done Caltech a great service by bringing together a visual history of the campus. Our campus represents the finest of a regional style of American architecture that fuses traditions from other warm, sunny societies — the Spanish, the Italians, the Moors. Walking the campus it feels in places like a monastery, in places like a great European fountained garden — but the whole is subservient to the larger goals of the institution, deep scholarship and wresting truth from behind the veil of nature. Romy has traced for us the origins of this unique and effective environment. Her book is at once a record of remarkable achievement and a challenge to be certain that we honor that achievement as we move forward.

David Baltimore
President
Small Beginnings

"It is a great undertaking for me at my age but I desired to see it started in my lifetime, and...I wished to use those short days, years,...in putting in operation an institution of public utility...

My means are, of course, very limited to found a university but if started right and in a way to meet a public necessity and public favor, it will be maintained...as other institutions have been supported."

— Amos Throop to cousin Cordelia in Iowa, 1892

The roots of the world-renowned California Institute of Technology lie in a small, nascent university created by Amos Gager Throop in 1891.

Amos Throop, the third of seven children, was born in 1811 in New York state. Lacking the opportunity of formal schooling because his parents were poor, Throop learned the meaning of hard work while still a youngster.

Just before his 21st birthday Throop left New York to travel west. He quickly developed a sense of entrepreneurship by saving money from jobs and investing in a variety of projects. After returning to New York to marry, he and his wife Eliza moved to Michigan before settling in Chicago where Throop became a successful businessman and politician. In 1880 the Throops traveled to Los Angeles, invested in a farm, and seven years later bought a home in Pasadena.

Then 76 years old, Throop became involved in the affairs of this 5,000 inhabitant community and was elected Mayor.

As a young man Throop had joined the Universalist movement, and later helped establish a church in Chicago before becoming the major benefactor and founder of the first Universalist Church in Pasadena, subsequently renamed Throop Memorial Universalist Church.

In spite of his own lack of education Amos Throop's greatest contribution was to education. Pasadena, which began as a scattering of farms and orchards, had been accessible by rail since 1873 and now had a small business district, a public library and several public and private schools, but no college.

In 1891, Amos Throop established Throop University with an enrollment of 35 students. The purpose of the school is described in its first bulletin, "To furnish students of both sexes and all religious opinions a liberal and practical education, which, while thoroughly Christian, is to be absolutely non-sectarian in its character."

Throop rented space in a large building owned by P. G. Wooster on the corner of

Amos Gager Throop, Caltech's founder. He was known as "Father Throop" because of the valuable contributions he made to Pasadena. He founded the Universalist Church and Throop University, and he was Mayor of the city.
The Wooster Building, Throop University's first home. The building still stands on the corner of Fair Oaks Avenue and Green Street. It is connected to what remains of Pasadena's grand old Green Hotel.
Fair Oaks Avenue and Kansas Street (later renamed Green Street). The building, known as the Wooster block, survives today connected to what remains of Pasadena’s grand old Green Hotel. Its massive masonry exterior, enhanced by Romanesque arches and a corner turret, was typical of late nineteenth century commercial construction. The building housed classrooms and a dormitory until 1893, when East Polytechnic Hall and West Hall were constructed on Chestnut Street between Fair Oaks and Raymond Avenues, and adjacent to the original Universalist church founded by Throop.

Although Throop planned a university with the hope of adding a law school, lack of funds and students brought about a new direction. In 1893 he hired Charles H. Keyes as President and changed the school’s name to Throop Polytechnic Institute. Throop, who had learned about life through physical labor, regarded the late nineteenth century educational practices as too dependent on books. His educational philosophy was shared by Charles Keyes and was summed up in the school’s motto “Learn by Doing.”

Amos Throop died in 1894 at the age of 82, leaving a legacy for others to carry on.
In the next few years Throop Polytechnic’s development became more diverse both in its curriculum offerings and the composition of the student body, with the teaching program divided into six separate schools ranging from elementary to college.

A 1902 article titled, “Hand, Eye and Brain,” published in Land of Sunshine, described a student’s first year. “He spends the major part of his time in study of Mathematics, English, the Modern Languages, Latin, Chemistry, Physics, Zoology, Botany, Physiography, Free-hand and Mechanical Drawing. But these branches of learning are applied by daily practice in Carpentry, Wood-turning, Wood-carving, Forging, Pattern-making, Machine Shop Exercises, Cooking, Sewing, and Clay-modelling.” In addition chemistry and physics were taught in “expensively equipped laboratories.” Tuition for all of the above was listed at $75 a year.

However, the course of Throop Polytechnic’s destiny was soon to be altered by a young astronomer named George Ellery Hale. Hale was born in 1868. His father, an elevator manufacturer, taught him to tinker with tools, while his mother encouraged a love of books. He studied physics, chemistry and mathematics at MIT and with his father’s help built the Kenwood Observatory in the grounds of his home in Chicago. Before the age of 30 he had invented the spectroheliograph, become director of the Yerkes Observatory in Wisconsin, and founded the Astrophysical Journal. In 1902 he was elected to the National Academy of Sciences. Two years later, at the age of 36, Hale succeeded in persuading the Carnegie Institution to fund a solar observatory on Mount Wilson above Pasadena with himself as director.

Hale’s youth and energy blended well with the new, fast-growing community of Pasadena. He was instrumental in making a City Beautiful Plan more than a subject for discussion or a drawing on paper. After suggesting an architectural competition, he chaired the jury who selected the architects for the City Hall, Civic Auditorium and Central Library.
In 1907, three years after establishing the Mount Wilson astronomical observatory, Hale joined Throop Polytechnic’s Board of Trustees and quickly persuaded his fellow members to alter the school’s multi-faceted program and “concentrate their entire attention on mechanical and electrical engineering” with “adequate instruction in the humanities.”

The Institute was as diverse in its curriculum as it was in its roster of Presidents. One of Hale’s first jobs as a board member was to find a new leader. Unable to persuade a scientist to accept the challenge, Hale selected James A. B. Scherer, head of Newberry, a small sectarian college in South Carolina. Scherer, who became President in 1909, made up for his lack of scientific
training by energetic planning, an ability to raise money, and becoming a voice for the school in articles and speeches. For the 
Arrivo Craftsman he wrote an essay, “The Throop Idea: Character, culture, and good craftsmanship might well spell our creed.”

Supervising the divestment of Throop Polytechnic was one of Scherer’s early challenges. Shedding all its schools except the college, he reduced the student body by one third, and established it as an all male institution of higher learning. The elementary school moved to the southeast corner of Catalina Avenue and California Boulevard and became the Polytechnic School, now a private co-educational school for ages 6 to 18.

In 1910, as Throop Polytechnic changed its makeup, it left its home in the increasingly crowded area of downtown Pasadena and moved to a 22-acre campus bordered by California Boulevard on the south and San Pasqual Street on the north; Wilson Avenue on the west and Holliston Avenue on the east. The land, planted with orange trees, was a gift from Arthur Fleming, a Canadian of Scottish descent. He had become a citizen of the United States and an attorney in Detroit before moving to California in 1896 where he established one of the largest lumber operations in the old west. As owner of several other companies and a director of the Southern California Edison Company, Fleming amassed a sizeable fortune. He became a Trustee of Throop Polytechnic in 1904. As well as donating the land, he helped to raise money from the citizens of Pasadena for the first building on the new campus. In 1921 he endowed Caltech with his personal fortune retaining only a small annuity for himself.

At the same time that Scherer was establishing Throop Polytechnic in its new home, the state government was considering opening a technical university in southern California to be called the California Institute of Technology. Not wanting a rival college nearby, Scherer, backed by the college trustees, proposed a bill handing over Throop Polytechnic to the state. The bill failed because the state universities in the north did not want to share funding with an upstart in the south and distrusted a college with an independent Board of Trustees. Throop Polytechnic, however, benefited from the publicity and enrollment increased. At this time, Hale offered to work with Scherer to make Throop into “a high-grade institute of technology.”

In 1908, the Los Angeles architectural firm of Hunt and Grey was hired to develop a master plan. Myron Hunt had received his architectural education at MIT but Elmer Grey, who was a talented designer and excellent draftsman, had no formal training. Both men had traveled in Europe.

Their brief partnership was formed in 1903 after Hunt had moved to California from Chicago in search of a cure for his wife’s tuberculosis.

Architectural historian Robert Winter, in his monograph Myron Hunt at Occidental College, describes Hunt as a good, but not great architect. He was “a business man’s architect” who pleased his clients by keeping meticulous records of materials and costs.
Hunt and Grey's architectural plan. Fourteen buildings flanked a rectangular courtyard. They created a Mission-style campus with Mediterranean overtones: stucco walls, red-tiled roofs, cloisters, and patios. All the buildings would be two stories high except for the central building which, situated on the highest point of the site, would have three stories in the rear.

His designs were historical in concept but avoided historical details. Grey added color and creativity to Hunt's solid and functional buildings. But Grey's frills became Hunt's frustration. In describing his partner's design for Throop Hall he wrote, "Mr. Grey took up his pen and drew something in the picture without stopping to consider what the plan beneath might be."

After a tour of college campuses in the eastern United States, Myron Hunt decided to use Thomas Jefferson's design for the University of Virginia as his model for
Throop Polytechnic. The Trustees had stated that there were to be fourteen buildings at a cost between two and three million dollars. A plan was to be developed but only one building actually built, not to exceed $26,000. The architects set their fee at five percent of the total cost.

Although Hunt and Grey's plan went through several revisions the theme remained the same. Fourteen buildings flanked a rectangular courtyard. The focus would be on the central building for administrative offices and library which would be perpendicular to the long axis of the court. The architectural style would be Mission with Mediterranean overtones.

On August 10, 1908, at a grand dinner in the Green Hotel, Hale made an eloquent announcement about Throop Polytechnic's first building on its new campus. The design was explained by Hunt and Grey, with the aid of a stereopticon show and sketches displayed on the walls of the dining room. The citizens of Pasadena, inspired by the presentation and urged on by Fleming, raised $160,000 for the building's construction. In their honor it was named Pasadena Hall. In 1920 when the school became the California Institute of Technology, Pasadena Hall was renamed Throop Hall to retain the name of the school's founder.

Initially the facade of the main building was to be like the Ducal palace in Venice with a large shaded arcade below and a skylit library on the top floor. With only administrative offices and a library stipulated the architects were at a loss to know how to plan the rest of the structure. On August 10, 1908, Hunt expressed his frustrations in a letter to Scherer, who was still at Newberry, "We are mentally so constituted as to find ourselves at sea when we do not know the cases to which windows back of a dream are to be put." As soon as he took office Scherer became deeply involved in the plans, making many changes both in the requirements and the design.

Hunt wanted to create an impressive building without using a dome which he felt was "an expensive luxury...and incidentally I do not believe it makes the ideal Library." But Grey sketched in a dome ignoring the space below. Although the concept pleased the Trustees, Hunt was upset because the dome was not a true dome. Later the domed tower room was referred to as "Hunt's Heartache."

In order to make the entrance to the building more imposing Hunt and Grey had recommended that sculptor Alexander Stirling Calder, at that time a Pasadena resident, be asked to design an archway. Calder, the son of a sculptor and father of the inventor of the mobile, had attended the Pennsylvania Academy of Fine Arts and studied at the École des Beaux Arts in Paris. Dr. Norman Bridge, president of the Board of Trustees, dispelled his colleagues' concern that sculptured arches would be too elaborate by offering to pay Calder's commission of $5,000.

Finding the inspiration for his designs in President Scherer's inaugural address, Calder used figures and symbols from mythology to represent the aims and scope of the Institute. In keeping with the Spanish theme of the building the sculptures were confined to an area above the entrance arches, but their style was simplified Beaux Arts rather than Spanish. At the time of their unveiling on February 10, 1910, they were considered one of the most important sculptural projects in Los Angeles.

On June 8 of the same year, the building was officially dedicated. In spite of being disappointed in many aspects of its design (several years later Grey maintained that he was responsible for the exterior design and Hunt for the plan and construction), Hunt was proud of his role. The building was designed to permit rearrangements of the hollow terra-cotta block partitions. Service pipes and wires fed into the building from an underground conduit which eventually grew into the steam tunnel complex encircling the entire campus.
Throop Hall was officially dedicated on June 8, 1910. At the ceremony, Hunt declared, "...the building which you are dedicating is built for the centuries to come. It has been built proof against fire. There is no wood in its composition save for its doors. Beneath that red tile roof is a concrete roof. The dome is of concrete. The floors, the staircases, are of concrete. The walls are of concrete and unburnable tile. It is fireproof and it is earthquake proof. It is a flexible building. It is an enduring building."

Overlooking the entrance hall of Throop's new building stood a seven-and-a-half foot statue of Apollo loaned to the college by Louis Bradbury, one of Elmer Grey's clients. Bradbury's father had ordered an exact copy made of the Apollo Belvedere after seeing the original in the Vatican Museum. Beloved by generations of students and adorned from time to time in a variety of garments, Apollo spent 30 years in Throop Hall until a remodel of the staircase forced his removal to a balcony between Throop and Kellogg.

Only 31 students and 12 faculty occupied Pasadena Hall at the beginning of its first academic year in 1910. As enrollment increased, civil, mechanical and electrical engineering, physics, humanities, administrative offices, library, bookstore and community cultural center filled the interior space from basement to cupola. On the exterior, Calder's arches became a backdrop and the steps a platform for graduation ceremonies, performances, rallies, and speeches by visiting dignitaries. Throop's new central building remained the nucleus of the campus until its demise in the early 1970s.
"The Old Dorm" with orange trees, 1917. Originally located on North Los Robles Avenue, this dormitory was designed in 1910 by Myron Hunt and Elmer Grey for the boys of Throop Academy. In 1915 it was moved to the new campus.

Henry Greene’s bungalow. The Dugout became the Throop Club, a place for off-campus students to eat lunch and hold gatherings. The Club remained an important part of Caltech life until the Winnett Student Center was constructed on the site of the Old Dorm in 1962. The "named bricks" were incorporated into its south wall and all Southern California brickholders were invited to the dedication.
Arthur Amos Noyes, Robert Andrews Millikan, George Ellery Hale. This portrait by Seymour Thomas hangs in the main dining room of Caltech’s Athenaeum.
Open Spaces

"[Our aim is] to increase cohesiveness and atmosphere of the campus, perhaps through landscaping and other means, with a goal of conveying a feeling of a more unified campus."
— Stephen Bechtel, chairman of Buildings and Grounds Committee, October 29, 1978

CAMPUS BEAUTIFICATION

In spite of Beatrix Farrand’s insistence on a master landscaping plan, only a few separate areas of the original campus were professionally designed. After 1945, the rapid growth of the postwar era left little time or money for a professional scheme to treat the open spaces.

Following the demolition of Caltech’s first building in 1973, the students suggested a garden in place of the formal concrete stairway proposed by A. Quincy Jones, architect for the Throop Study. Jones redesigned the area with winding paths following a sloping bank, ponds, water cascades, rocks, trees and shrubs.

On August 1, 1978, the Buildings and Grounds Committee, with Stephen D. Bechtel as chairman, met and suggested a review of the long range plans for the campus growth. Bechtel “indicated he hoped the Committee could suggest ways to increase the architectural cohesiveness of the campus, to provide the feeling that the campus is a more unified entity...but there is no intention of modifying the exterior of the Throop Gardens, circa 1975. At the suggestion of the students the site of Throop Hall was designed as an inviting garden with trees, shrubs and cascading pools. The Cleveland Wrecking Company donated a stately cedar deodor to replace the Christmas tree it had to remove from the dome of Throop Hall during the demolition process.
Landscaping became the key to Bechtel’s push for a campus cohesiveness. Thomas A. Lockett, principal of the firm Land Images, which has been in charge of Caltech’s landscape architecture since 1975, found that the campus lacked green space, color, signage, and seating areas for small gatherings or quiet study. There was also a need to integrate separate sections of the grounds into a more unified setting.

For many years the Institute’s geologists were disturbed by the fact that the rocks in and around the Throop garden pools were concrete imitations. In 1985, Caltech Associate Mrs. Dan Throop Smith, the great-granddaughter of Amos Throop, funded improvements to the Throop site. The money was used for reseeding the grass, putting in new plants and shrubs, refilling and stocking the pools with goldfish, and acquiring authentic rocks. Geologist Leon Silver (the W. M. Keck Foundation Professor for Resource Geology) organized a rock search. He selected specimens flushed out of the San Gabriel mountains into the Devil’s Gate Dam near JPL.
Throop Garden, 1985. The 40 authentic boulders at the Throop site are identified on a plaque. But Professor Silver says “there are some mysterious rocks that I don’t understand. These will be a challenge for our geology students, and ultimately, some of them will solve the mystery.” Every first year geology class makes a field trip through the gardens to find “books in the running brooks, sermons in stones, and good in everything.”
Romy Wyllie is an interior designer and co-founder of the architectural tour service at the California Institute of Technology for which she was named an Honorary Alumna. She previously taught architectural history and interior design at the Harrington Institute of Interior Design in Chicago. For six years she was managing editor of the Journal of Geology at the University of Chicago. Pursuing her interest in Bertram Goodhue, Caltech’s master architect, Wyllie wrote *Bertram Goodhue: His Life and Residential Architecture*, which was published by W. W. Norton in 2007. Her articles have appeared in the Los Angeles Times, Chicago Tribune, San Francisco Chronicle, New York Times, and The New Republic.

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Amos G. Throop and Caltech

One educational institution which began at least theoretically "under the patronage and control of Universalists" but which soon lost both its denominational character and its original purpose was Throop Polytechnic Institute in Pasadena, California. It was the brief and imperfect fruition of a dream expressed by the California State Convention which in 1860 encouraged the establishment of a combined college and theological school to serve the denomination on the Pacific coast. Nothing came of the plan, but the dream did become at least a partial reality at the end of the nineteenth century. The person responsible was Amos G. Throop (1811-1894), a wealthy businessman and active Universalist layman who moved to the West Coast from Chicago in 1880.

Throop was born in Madison County, New York, in 1811, and spend his boyhood on a farm. He moved to Michigan in 1832, where he engaged in the lumbering business which became the basis for a substantial fortune. In 1843, he located in Chicago, where he prospered as a businessman specializing in real estate and become active in local civic affairs. He served on the City Council from 1849 to 1853, and between 1876 and 1880, was sufficiently well known as an alderman to have had a street named after him. He was also a charter member and officer of the Chicago Board of Trade. While residing in Chicago he was a member of the Church of the Redeemer (Universalist) and was one of the three lay delegates to the General Convention from Illinois in 1862.

Throop enlarged his holdings by investments in California where he lived first in Los Angeles and then in Pasadena, beginning in 1887. He was a major contributor to Universalist organizations. He provided $200,000 and a site for what was known originally as Throop University. The original board of fifteen trustees, of whom two were women, consisted
largely if not entirely of Universalists. The coeducational school opened in the fall of 1891, advertised ambitiously as a combined preparatory school, liberal arts college, law school, art school, and technical school providing teacher, business, and manual training. James H. Tuttle, pastor of the largest Universalist church in Minneapolis, who spent many of his winters in Pasadena, was to head the new school.

The institution in 1892 enrolled sixty-five students, with plans to spread over eight divisions including such diverse departments as the collegiate and one for the industrial training of women, which included sewing and cooking classes. The president was Charles H. Keyes from Wisconsin rather than Tuttle, who was reluctant to relinquish his pastorate in Minneapolis. Sixteen other individuals comprised the faculty. The manual training department, which became the most numerously populated segment of the "university," was opened in September 1892 with 171 students in a leased forty-room facility known as the "Wooster Block." A building known as "Polytechnic Hall" was erected the same year and in 1893 another building was added. In the same year the school became "Throop Polytechnic Institute," with an enrollment of 175. The curriculum included such disparate practical subjects as stenography, typewriting, cooking, botany, biology, and carpentry.

The institution continued to exist and to bear his name long after Throop’s death in 1894. It became primarily a technical and trade school, and in 1914 was renamed “Throop College of Technology.” In 1920 the name of the founder was dropped and the school became the California Institute of Technology (known popularly as “Cal Tech”). The individual who saw the possibilities of transforming Throop College into a major center of scientific and engineering research was George Ellery Hale, an astronomer who established the Mt. Wilson Observatory near Pasadena. Together with Arthur Amos Noyes, a chemist, and Robert Andrews Millikan, a physicist, Hale arranged for the change of name and a revised curriculum. Although not officially created as a denominationally controlled school, what had evolved as a vocational school and later as a distinguished university, represented another contribution of Universalists to American educational diversity.

A Universalist Church was, however, organized in Pasadena in 1886 as a visible reminder of Throop’s generosity by way of a gift of $16,000 in 1890. The Universalists never established the theological training facility envisaged by Throop, but ten years after his death the Pacific Unitarian School of the Ministry was established. The school, which later became the Thomas Starr King School for Religious Leadership, provided the preparation for clergy in the liberal church.