



*Robert A. Millikan, Chairman of the Executive Council of the new California Institute of Technology.*

## THE ROOTS OF THE CALIFORNIA INSTITUTE OF TECHNOLOGY III

by Imra W. Buwalda

In 1913 Throop officially recognized its new status as a college by adopting the name Throop College of Technology, and the trustees were now ready to build their "first-rate technical school" into a world center of scientific research and instruction.

Throop made its first giant step toward this ambitious program when George Ellery Hale brought to its faculty the distinguished chemist Arthur Amos Noyes. Noyes, vice president and former acting president of MIT, agreed to come to Throop as professor of general chemistry from February 1 to March 31, 1914, and to act at all times as consultant in the development of teaching and research in chemistry. Beginning in 1916, Noyes extended his time at Throop to half a year and became director of chemical research.

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*This is the last in a series of articles on the early history of Caltech, adapted and edited by Elizabeth K. Hutchings from a manuscript by Mrs. Buwalda.*

In 1916-17 a \$100,000 fund for physical research was provided, and again Hale sought out the country's top man in his field to develop the program. In January 1917, Robert A. Millikan agreed to spend three months each year at Throop to work in cooperation with Noyes in chemistry and Hale in astrophysics. President Scherer told his trustees that the three men would unite in an attack on problems of the electron theory.

The need for buildings to accommodate its expanding research program and its growing student body was Throop's greatest concern in the years preceding World War I. The 22-acre campus still had only one building—crowded Pasadena Hall.

During the summer of 1915, Throop's board of trustees appointed the famous architect Bertram C. Goodhue to supervise all future campus development. Goodhue replaced Myron Hunt, who had fought, and largely lost, epic battles with Scherer and Fleming over the design and construction of

## Throop College pauses for the war years, then surges ahead as the California Institute of Technology.

Pasadena Hall. In 1915 P. G. and C. W. Gates donated funds for a new chemistry building to be designed by architect Elmer Gray.

But there was still no housing for students. The trustees solved this problem by having the old North Los Robles dormitory sawed into seven parts, hauled to the new campus, and put together again. The trustees voted \$25 for paint with which students covered the scars of the cuts, and the "Old Dorm" opened in the fall of 1916 with rooms for 60 students and a lunchroom, known for decades as the "Greasy Spoon."

Throop's plans for expansion were temporarily halted by World War I, when the faculty, administration, and trustees gave most of their time to the war effort, and the campus became a military training center.

Hale led in the founding of the National Research Council, formed to mobilize the nation's scientific resources for preparedness. He served as chairman of the Council's five-man organizing committee, which included Robert A. Millikan and Arthur A. Noyes. Millikan became its vice chairman and executive officer and in this capacity spent the war years in Washington.

The role played by Hale, Noyes, and Millikan in founding the National Research Council led to a unique role for Throop College in the wartime research program of the Council. At the June 5, 1916, meeting of the trustees, Hale offered Throop the opportunity to be first in the country to "aid the government in research for defense," the aid proposed being the use of the college laboratories and provision of a special endowment.

Throop's response was such that the Council sent a letter to a "selected list of educational institutions with a view to the stimulation of interest in research," citing Throop as a "concrete illustration of what can be done."

The letter enumerated specific steps Throop had taken in connection with the work of the Council, including its promise of all available research men and facilities in the event of war, the establishment of a wind tunnel and aerodynamics laboratory, and cooperative physical, chemical, and astronomical research under Millikan, Noyes, and Hale.

Research in aeronautics at Throop was established in 1917 at the suggestion of the National Re-

search Council. Trustee Tod Ford donated funds for the construction of a small wind tunnel with a maximum velocity of 40 miles per hour.

In cooperation with the Mt. Wilson Solar Observatory and Stanford University, a war laboratory was erected at a cost of \$4,500 to study problems of supersound and of nitrate supply, and a laboratory for research in submarine detection was established. Both of these programs were conducted under the direction of the National Research Council.

On April 22, 1916, President Scherer announced at a student assembly that Throop would introduce military training, on a voluntary basis, the following September. A petition signed by 80 percent of the students requested that the program be made compulsory. The Throop College Battalion, established in the fall of 1916, became the first ROTC unit in southern California and the first for engineers in the country.

The Camp Throop project came next in a series of military training programs. The idea of establishing an official training camp in southern California, as a "subsidiary to the Army's Presidio" in San Francisco, was conceived by the Military Training Camps Association. On April 3, 1917, the trustees voted to provide facilities for "intensive training for officers with the understanding that this would not involve additional expense to the college, or interference with the regular college work."

Camp Throop was made ready with incredible speed. The college cleared all the orange trees from the campus (a move which resulted in considerable loss of revenue), and Throop engineers ran all the survey lines. By May 4 the Los Angeles *Examiner* reported that:

. . . mess tents, headquarters tents, the post office and camp exchange tents are erected and scores of men are busy at work . . . laying out the streets and locations for the company tents which are expected to be here tomorrow.

By May 7 water and sewer lines were laid and, according to the *Star-News* of that date:

Several truck loads of lumber were delivered yesterday to make the cook house, while the mess tent, as large as the ordinary circus tent, is already in place in rear of the company streets. These streets are made of eighty regulation size pyramid tents made in Los

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## The Roots . . . *continued*

Angeles for the camp . . . 15 tons of straw to fill bed sacks have been delivered . . .

Extensive off-campus training was also planned. A headline in the Los Angeles *Express*, May 8, 1917, reported:

TRENCH FIGHTING TO BE FEATURE AT THROOP MEN TO LIVE, EAT AND SLEEP LIKE SOLDIERS "SOMEWHERE IN FRANCE"

About 2500 acres of land, south and east of Camp Throop and extending down as far as Wilson's Lake have been placed at the disposal of the camp by Henry E. Huntington, William R. Staats and Company, and the Oak Knoll Company . . . This acreage will be converted . . . into a European battlefield, complete with trenches, fortifications, miniature rivers, and every device possible to give the men in training a conception of warfare as it is to be.

The Camp Throop project collapsed completely, however, one week before its opening date. On May 11 the War Department announced that it could not furnish instructors, arms, or equipment to any camps but its own. Although the department expressed the hope that the camp would go ahead with whatever equipment the school could supply, both the Military Training Camps Association and Throop College agreed to abandon the costly and frustrating project.

In the autumn of 1918 Throop College started training enlisted men in the nationwide Students Army Training Corps program. Under the SATC, in which 500 colleges participated, all students over 18 became "enlisted members of the military forces." A mess hall and barracks to accommodate 300 men were erected on campus, and on October 1, 1918, the Throop College unit of the SATC officially began operations.



General Pershing tours campus with President Scherer.

Then came the Spanish influenza epidemic. In an attempt to prevent its spread, all furloughs were cancelled, and the students were confined to the camp. The first floor of the Old Dorm became the hospital where ladies from the Red Cross cared for the desperately ill boys.

Royal Sorensen, professor of electrical engineering, recalling the epidemic, wrote that "during mass quarantine, daytime activity and all business of soldiering went on at full tilt. But what could be done at night for recreation? The only club or entertainment room was a huge tent provided by the college YMCA. This became, for three nights of the week, a movie theatre operated by an engineering professor who passed the hat after each movie in order to rent another film."

"The most conspicuous countermeasure in the flu combat," Sorensen also wrote, "was the gauze flu-mask which, by order through the land, was a demand regulation . . . To be seen off limits (the home) without a mask was cause for arrest. We were a spooky-looking, disgruntled lot, for though everyone feared to be without a mask, there was an almost universal opinion the masks were just a damned nuisance and wholly ineffective. On November 11, 1918, when the sudden clamor of bells, horns, and whistles announced the signing of the Armistice, most of Pasadena headed for Marengo and Colorado Streets to join the unorganized but orderly parade which continued for hours. Some had their masks as required by law, but they were off the face hanging by a loop over one ear. Most people had forgotten their masks."

The Student Army Training Corps program was not considered successful by either the administration or students at Throop. "There was grave disorganization," Scherer wrote in his 1919 annual report, "due to the constant influx of confused and confusing orders from Washington—further accentuated by an epidemic of influenza . . . My opinion of the SATC as a whole is emphatically unfavorable." A student editorial in the *Throop Tech* called "the plan of attempting to train soldiers and students simultaneously . . . one that could not possibly succeed . . ."

The winter following the Armistice was a difficult time for Throop, now faced with the enormous job of "retooling" for peace as quickly as possible. By 1919 Throop's student body numbered 340, as compared to 31 in 1910 and 185 in 1916, and new buildings were badly needed. Furthermore, the board's new policy of increased emphasis on research had to be implemented. Because the flu epidemic, though past its peak, was not over, classes were suspended from January 18 to February 3, 1919.

President Scherer, exhausted both physically and mentally by the stresses of the war years, requested a leave of absence from February to September 1919. He had plunged enthusiastically into war service as early as the spring of 1916. In the spring of 1918 Scherer publicly protested what he felt to be the anti-Japanese editorials of the Hearst newspapers. When he was mildly rebuked by Secretary of War Newton Baker for this open criticism of Hearst policy, he resigned from the Council of National Defense. He then became field representative of the United States Emergency Fleet Corporation until the autumn of 1918 when he returned full time to Throop College.

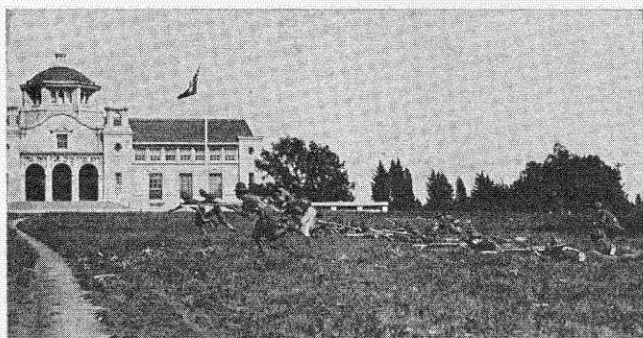
The war service obligations of the trustees, some of whom had served as \$1-a-year men in Washington, continued during much of the winter, and it was not until May 13, 1919, that the board was able to hold its long-deferred annual meeting. Though technically on sick leave, President Scherer compiled his Ninth-Tenth Annual Report (February 1917 to May 1919), stressing the pressing need for buildings, equipment, and endowment for faculty salaries. The board voted to undertake a "quiet financial campaign" to raise two million dollars.

The campaign had, in fact, already begun, for on March 27, 1919, Arthur Fleming had signed a contract subscribing \$1,000,000 to the college. Of that sum, \$200,000 was to be set aside for research in physics to match \$200,000 already donated for chemical research by Mrs. Milton Loyd-Smith. By January 1920, when the Fleming gift was made public, Throop was able to announce gifts of \$150,000 (later raised to \$250,000) from Dr. Norman Bridge for a physical laboratory, \$75,000 for the first unit of an auditorium, and \$50,000 from the R. R. Blackers "with no strings attached."

In a brief period immediately following the war, the modern California Institute of Technology was created. Between 1919 and 1921, Throop secured an endowment rivalling that of any scientific institute in the country, established a new policy to govern its future conduct, changed its name, and found a new administrative head to lead it in its next quarter century of growth.

In 1919 Arthur Amos Noyes resigned from MIT to give full time to Throop; and in January 1920, Robert A. Millikan, after a long wartime absence, resumed his quarter-of-a-year service as director of physical research.

In February 1920 the board met for the last time as trustees of Throop College of Technology. On February 10 they voted to change their school's name to The California Institute of Technology, "in order to denote and signalize its altered scope, re-



*The Student Army Training Corps on Throop campus.*

cent developments having transformed it from a college of primarily local significance into a scientific school of national importance."

Although President Scherer had resumed his duties following his six months' leave, he had never fully regained his health, and on March 3, 1920, he submitted his resignation. When it became evident that Scherer could not continue as president, Throop's trustees concentrated on zealous pursuit of Robert A. Millikan to replace him. As early as 1919 Norman Bridge had offered to build a laboratory of physics to Millikan's own design and specifications if he would become its director. Now Arthur Fleming, who had already given \$1,000,000 to the college, offered to turn over his entire fortune if Millikan would accept the presidency. But George Ellery Hale "was my most ardent wooer," Millikan wrote in his *Autobiography*. "He did not quite tell me that he would shoot himself if I did not yield to his suit, but I did actually have some misgivings about his health if I turned him down."

On April 4, 1921, the board formally offered Millikan the position of president of the Institute and director of physical research, with the guarantee that not more than a fourth of his time would be devoted to administrative work. Millikan accepted the offer, with the stipulation that he be called Chairman of the Executive Council, which would consist of three trustees and three faculty members. He arrived to take up his duties in the fall of 1921, and the modern California Institute of Technology was launched.