

UC Berkeley

College History

Title

College of Chemistry: Establishing excellence (with some detours)1860s to 1960s

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<https://escholarship.org/uc/item/23c0v5qb>

Author

Strauss, Herb

Publication Date

2012

Peer reviewed

Establishing excellence

(with some detours)

1860s to 1960s

Herbert Strauss

Establishing a world-class institution was the dream of the founders of the University of California at Berkeley. After controversy over goals (applied vs. liberal curriculum, budget), systematic efforts were made to connect the University to the intellectual life of the day. Before Chemistry became a great department under G. N. Lewis starting in 1911, important scientists had been persuaded to make the train trip of many thousands of miles to lecture in Berkeley. Berkeley people seeded much Chemistry in the West, including J M Stillman, founder of the Stanford Chemistry Department and William C. Morgan, first Chair of the UCLA Department. During the 1920s and 1930s when little hiring was done, Lewis managed to hire Giauque and Calvin and Seaborg - as well as Libby - all of whom won Nobel Prizes. Berkeley was known for its Physical Chemistry and soon the other areas of chemistry achieved prominence as well.

(Talk Sept 2012)

UC Berkeley: Establishing Excellence

Report of the President, W. T. REID, to the
Board of Regents
1882

Chemistry

“The superior opportunities for the study of chemistry offered in our College of Chemistry are well known. Our chemical laboratory is equaled in but few colleges in the country. Nothing further need be said.”

Timeline

- 1856 Santa Clara College: first Professor of Chemistry and Natural Sciences, Father Masea.
-
- 1855 College of California (private)
- **1862 Morrill Land Grant Act**
- 1866 Agricultural, Mining, and Mechanical Arts College established
- 1867 **University Founding** by merger of the College of California and the Agricultural, Mining, and Mechanical Arts College
-
- First professors
- (Note differences in title!)
- 1868 Robert Fisher appointed **Professor Chemistry, Mining and Metallurgy** (education at Yale, Heidelberg and Paris). **Position abolished by the regents in 1870** : duties to be taken up by the Prof of Agriculture
- 1869 Ezra Carr (M.D. from Vermont) Called for more practical instruction and for an elected board of Regents. **Dismissed 1874 by the Regents**, but soon elected State Superintendent of Public Instruction.
-
- 1872, **College of Chemistry**

South & North Halls (view from the east)



Letters:
Demolished
1917

Science with
Chem labs.
Still stands:
converted to
Information
Sciences

From Gayley Rd

Watchman's cottage at College Avenue entrance to campus at lower left.
(Courtesy, College of Engineering web site.)

1872- -1909 Willard Rising (Dean '96-'01)



1874

(Note the functional
fireplaces.)

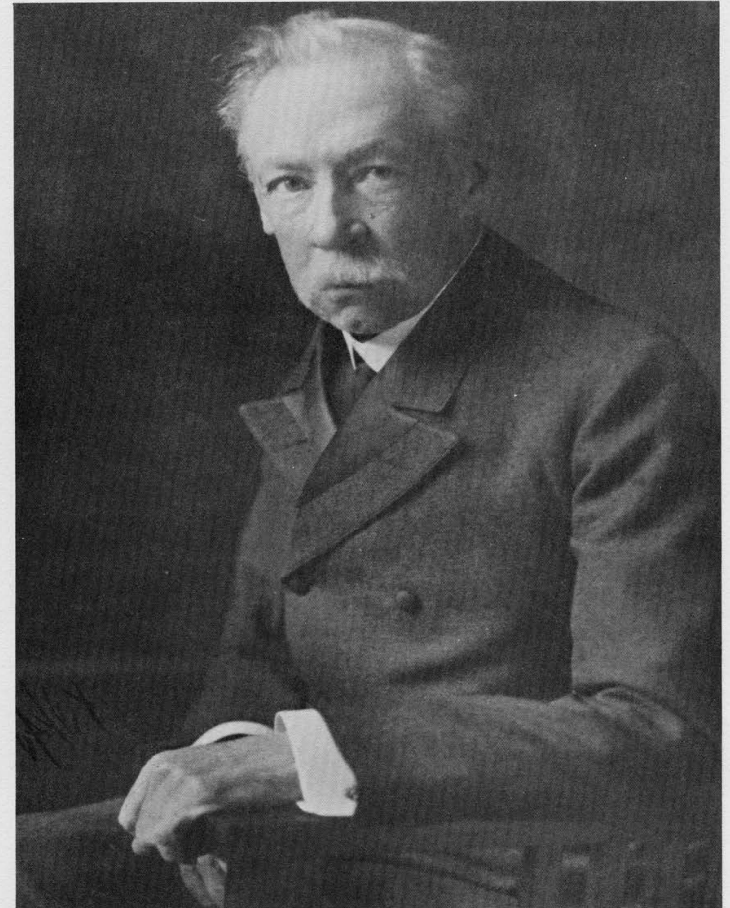
Studied in NY and under
Bunsen in Heidelberg

“Bewildered Rising”

(analytical chemistry –
water , etc. State Board
of Health)

John Maxson Stillman

- 1874 graduated University of California
- Studies in Germany
- 1876 instructor University of California
- 1882 Boston and American Sugar Refining
- 1891-1917 **Stanford** (son of Stanford's old-time friend, and family physician) Head of Stanford Dept '04-'14



JOHN MAXSON STILLMAN
Member of the Faculty 1891 - 1917
Executive Head 1904 - 1914

Edmond O'Neill, Chemistry: Berkeley

University of California--Bachelor of Philosophy, 1879
Faculty 1879-1925 (graduate degrees from Germany)



The Edmond O'Neill Memorial Organs

Still building in the 1980s

Dean:
1901-12,
'18-'19

Benjamin Ide Wheeler

The University of California derives its origin from the union of a New England classical religious college (Congregational and Presbyterian) and a Morrill Act school of agriculture and mechanic arts [approximately correct]. It takes after both sides of the house, according to Galton's law (*i.e. from both parents*). The combination of qualities that are quite diverse and even antagonistic give the institution a unique attractiveness. I know of no other university which cultivates both mechanics and metaphysics with such equal success or which looks so far into space, and, at the same time, comes so close to the lives of the people; or which excavates the tombs of the Pharaohs and Incas while it is inventing new plants for the agriculture of the future.

Edwin E. Slosson, *Great American Universities* (New York, 1910), 148-49.

- Wheeler managed to last 20 years--17 of them in complete control of the situation. This fact constitutes much of the importance of his reign. With all its faults, the Wheeler presidency gave the University some time to emerge as a major institution.

Henry May 1993



President of the University (1899-1919) was born in Randolph, Massachusetts, July 15, 1854.

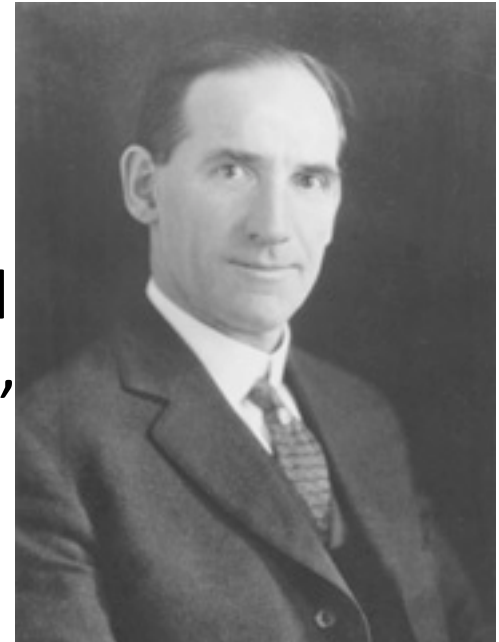
Instructor in German at Harvard for a year, Cornell University as professor of comparative philology and Greek.

Too “pro-German” in 1918 and tired? - yielding the GREAT Faculty Revolt

Frederick Cottrell

Born Oakland 1877, **B.S. Berkeley 1896.**

Graduate work Leipzig (under Ostwald) PhD 1902, Physical Chemistry faculty in Berkeley 1902-1911, invented and patented the Cottrell precipitator, then joined the Bureau of Mines, founded the **Research Corp**, provides research money to this day.



George A Hulett

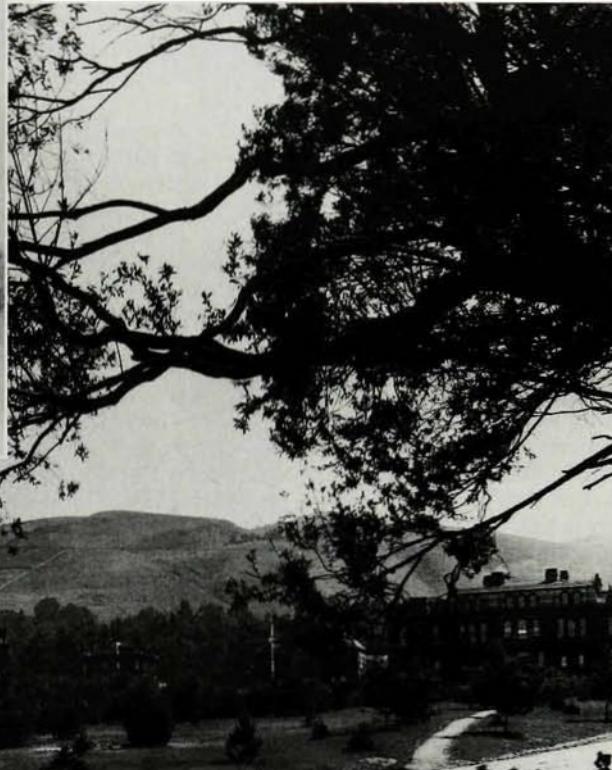
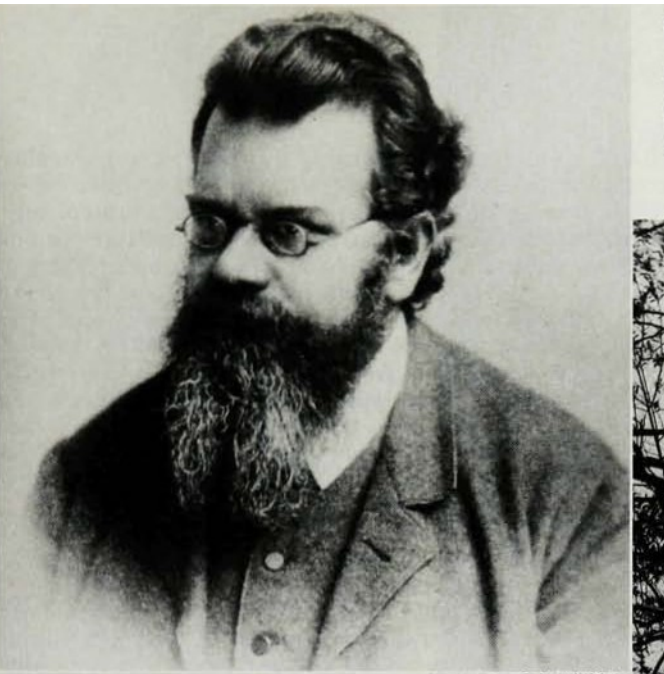
George A Hulett, recruited to Princeton by Woodrow Wilson, then **offered the Chairmanship at Berkeley** by Wheeler. He asked to hire one or two more physical chemists. Wheeler on O'Neill's advice refused! Hulett stayed at Princeton and then joined the Bureau of Mines as Chief Chemist in the Wilson Administration



George Augustus Hulett

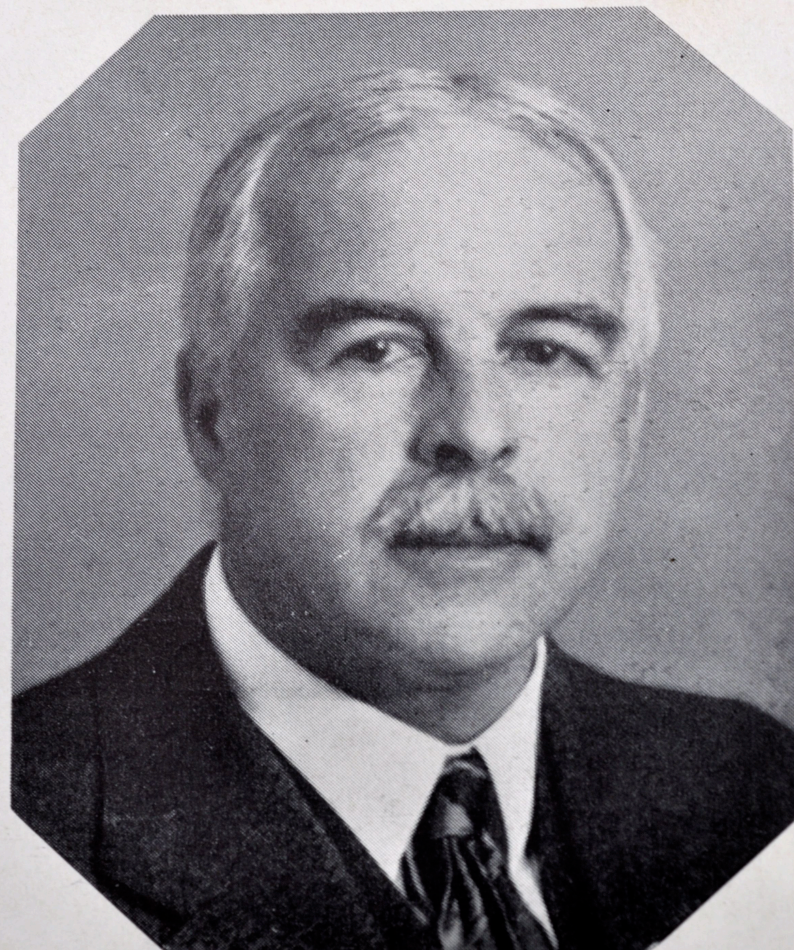
BOLTZMANN AND BERKELEY.

summer of 1905: teaching at Berkeley, which Boltzmann describes as "the loveliest place one can imagine," the newly built California Hall is on the left.



VISITORS:
1903 OSTWALD
1904 ARRHENIUS,
DE VRIES (GENETICS)

G. N. Lewis



GILBERT N. LEWIS
Dean of the College of Chemistry

A. B. Harvard, 1896
A. M. Harvard, 1898
Ph. D. Harvard, 1899
Sc. D. Liverpool, 1923

Lewis- “anything that is interesting”

- 1902 [cubical atoms](#) (Drawings, notes) (at Harvard)
- **Philippines!!!**
- 1908 -1912 [relativity](#) with *Tolman, Wilson* (at MIT)
- 1908 [activity](#) and coined the term "[fugacity](#)".
- 1911 to Berkeley
- 1913 elected [National Academy of Sciences](#). (resigned in 1934)
- 1916 paper on chemical bonding "The Atom and the Molecule"
- 1919 [magnetic](#) properties of solutions of [oxygen](#) in [liquid nitrogen](#), found that O₄ molecules were formed.
- 1921 [strong electrolytes](#), "[ionic strength](#)"
- 1923, Lewis theory of [acids](#) and [bases](#), a "[Lewis acid](#)" is an electron-pair acceptor and a "[Lewis base](#)" is an electron-pair donor.
- 1923 Book on Thermodynamics with [Merle Randall](#), which helped formalize modern [chemical thermodynamics](#).

- 1926 coined "[photon](#)" for the smallest unit of radiant energy (light).
- 1933 the first pure sample of deuterium oxide ([heavy water](#)) and the first to study survival and growth of life forms in heavy water.
- 1944 with [Michael Kasha](#), established that [phosphorescence](#) of [organic](#) molecules involves emission of light from one electron in an excited [triplet state](#)
- **1946 death in a HCN “accident” (Langmuir?)**
- Ref: Coffey, Patrick (2008) *Cathedrals of Science: The Personalities and Rivalries That Made Modern Chemistry*.
- Jolly, William L. (1987) *From Retorts to Lasers*
- Wikipedia articles • Various Berkeley Histories
- J Chem Ed
- Faculty Collage designed by Susan Wilson Photo, Cambridge MA.

- Date appointed to faculty
- 1912 :Lewis
- Richard Tolman from MIT and Berlin Then 1916 Illinois , government service, and Cal Tech Author of “Statistical Mechanics” 1938. First “theorist” to leave Dept.??
- 1913 Joel Hildebrand, George Gibson
- 1919 Wendell Latimer
-
- Nobel Prizes (*dates of appointment at Berkeley*)
- 1922 William Giaque (Gibson)
- 1923 (not on Faculty) Harold Urey (PhD Student of Lewis)(discovery of deuterium)
- 1933 Willard Libby (Gibson) then UCLA
- 1937 Melvin Calvin 1937 (U of Minnesota) (first not-Berkeley appointment in 24 years)
- 1939 Glenn Seaborg (Gibson) (postdoc Lewis)
- 1940 Henry Taube (PhD at Berkeley with Bray) then Cornell and Stanford
- 1939 Samuel Rubin (Latimer-Libby) (discovery of C-14 with Martin Kamen)
Died in phosgene accident in 1943 before Possible Prize
- (Mabel Kittredge Wilson – Grew up in Berkeley, became Dean’s secretary retired about 1971)

Harold Urey

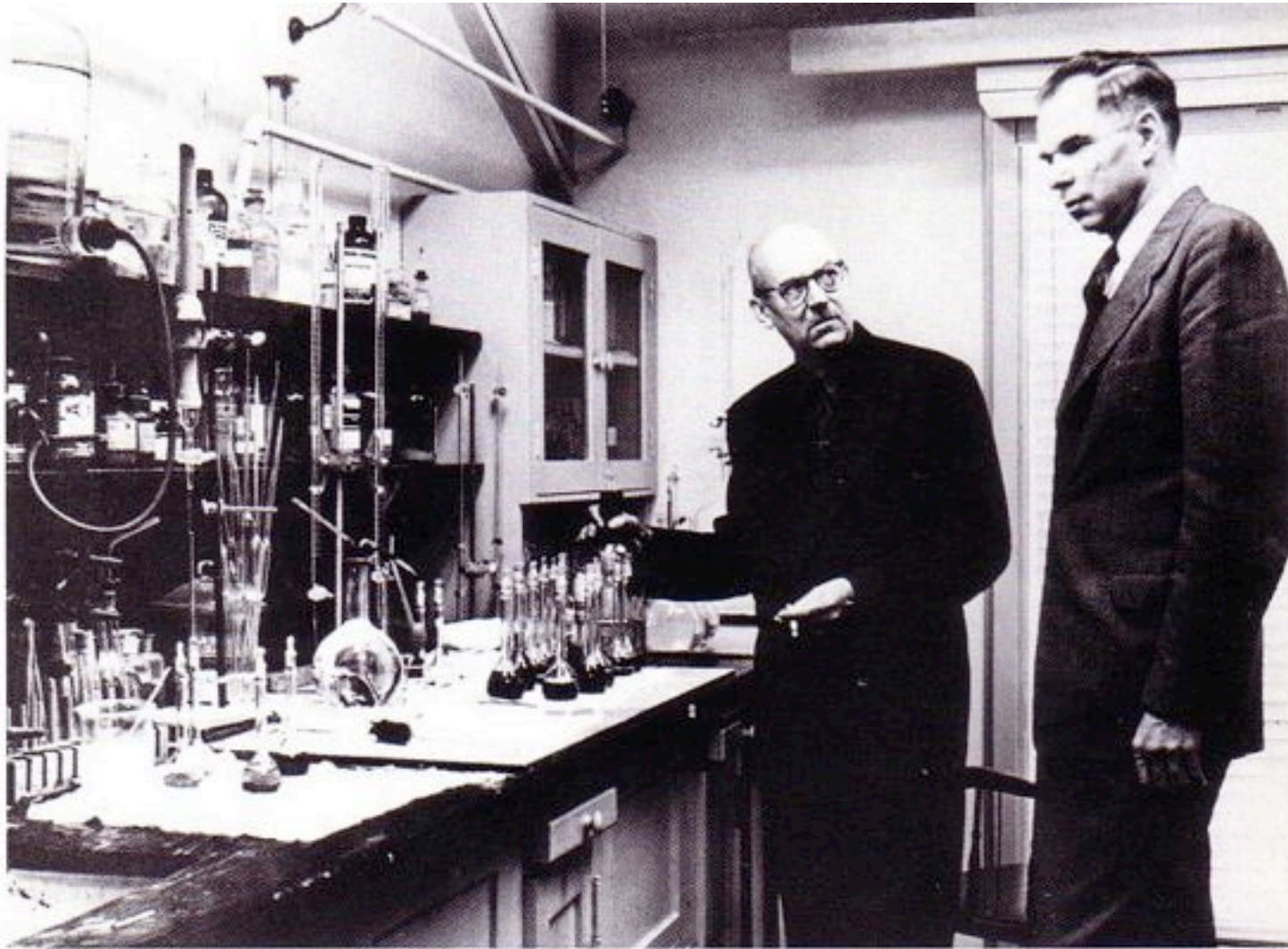
(on Lewis and Deuterium)

Nobel Prize 1934

In his autobiography written some forty years later, Urey wrote of Lewis' presence in the hunt for deuterium: "I have always felt badly about Professor Lewis' attitude in this matter. I have tried in the years since then, whenever my former students make an important discovery, to help them as much as possible rather than to try to take the subject matter away from them."

Unpublished autobiography dated 1970, Harold Clayton Urey Papers, Mandeville Special Collections Library, University of California, San Diego.

Latimer and Seaborg



Wendell M. Latimer (note the cigarette) and Glenn T. Seaborg in room 307 Gilman Hall, ca 1950.

Wendell Mitchell Latimer

Dean of the College of Chemistry, 1941-1949; and Chairman of the Department of Chemistry, 1945-1949.

- PhD 1919 (Gibson)
- Encouraged Nuclear Chemistry
- Started Organic Chemistry 1945 (Cason and Dauben)
- Chemical Engineering (P. W. Schutz, a Berkeley PhD, who died soon after appointment in 1946). Bromley, Berkeley PhD appointed 1946. Then Wilke and Vermeulen

Advice to Jim Cason on being offered appointment at Berkeley

“For most people I would recommend that they stay away from that den of narrow- minded physical chemists. But you are such a stubborn son of a bitch that I advise you to take the job-I don’t think they can budge you.” *Homer Adkins (Wisc) quoted by Jolly*

Early '60s

Myers, Powell, Hildebrand, Hanson, Perlman,
Redlich, Vermulen, Streitwieser, Cason, Gwinn, Templeton,
Jolly, Prausnitz, Orlemann, Brewer, Rapoport, Connick



Early '60s

Street, King, Interrante, Jensen, Koch, Goren, Pimentel, Petersen, Cerny, Williamson, Cunningham, Shirley, Calvin, Sederholm, Heathcock, Grens, Tobias, Moore, Johnston, Sauer, Strauss, Phillips, Burlingame, Somorgai, Scheer, Harris, Wallace, Kirtman, Bromley, Hearst, Ayen? Sternlicht?



