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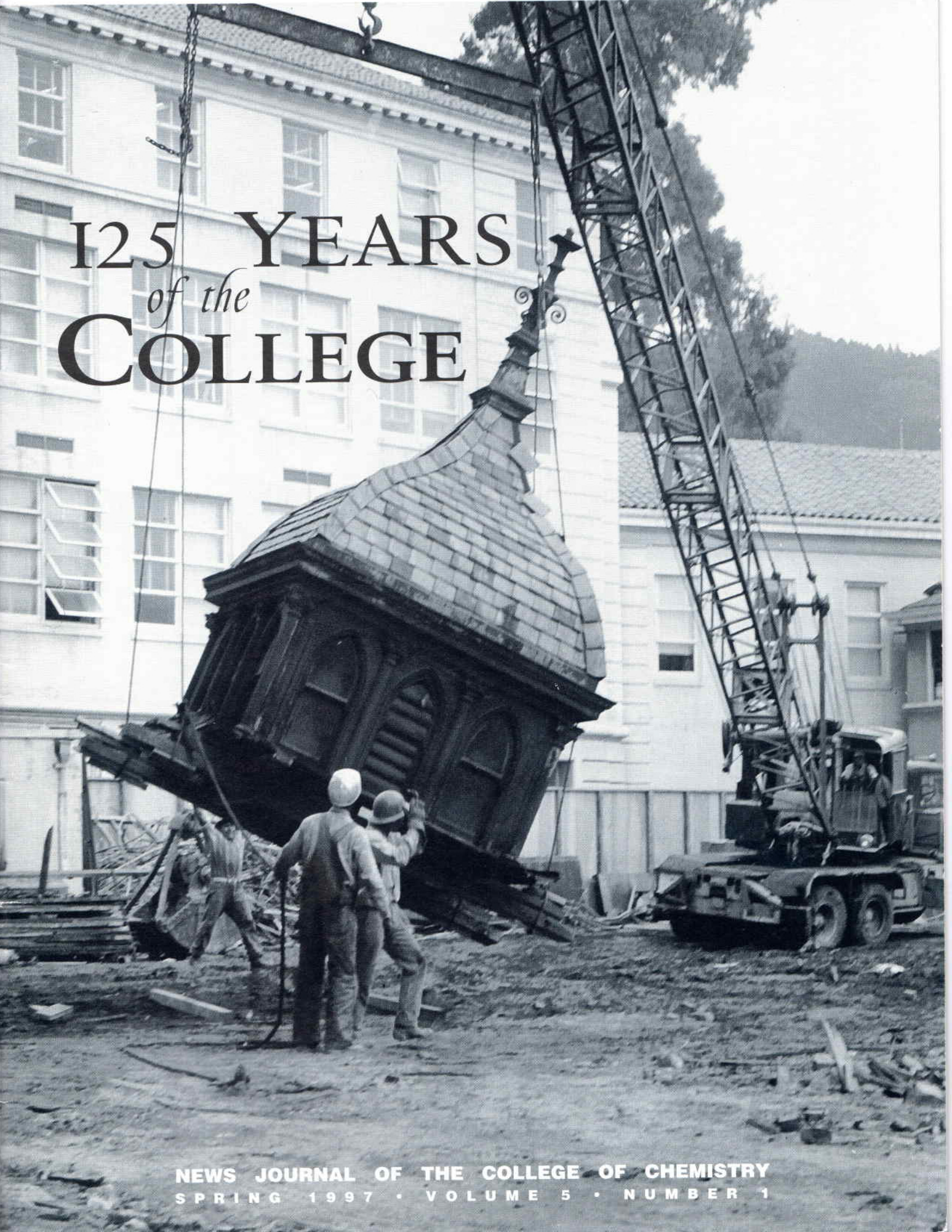

125 YEARS *of the* COLLEGE

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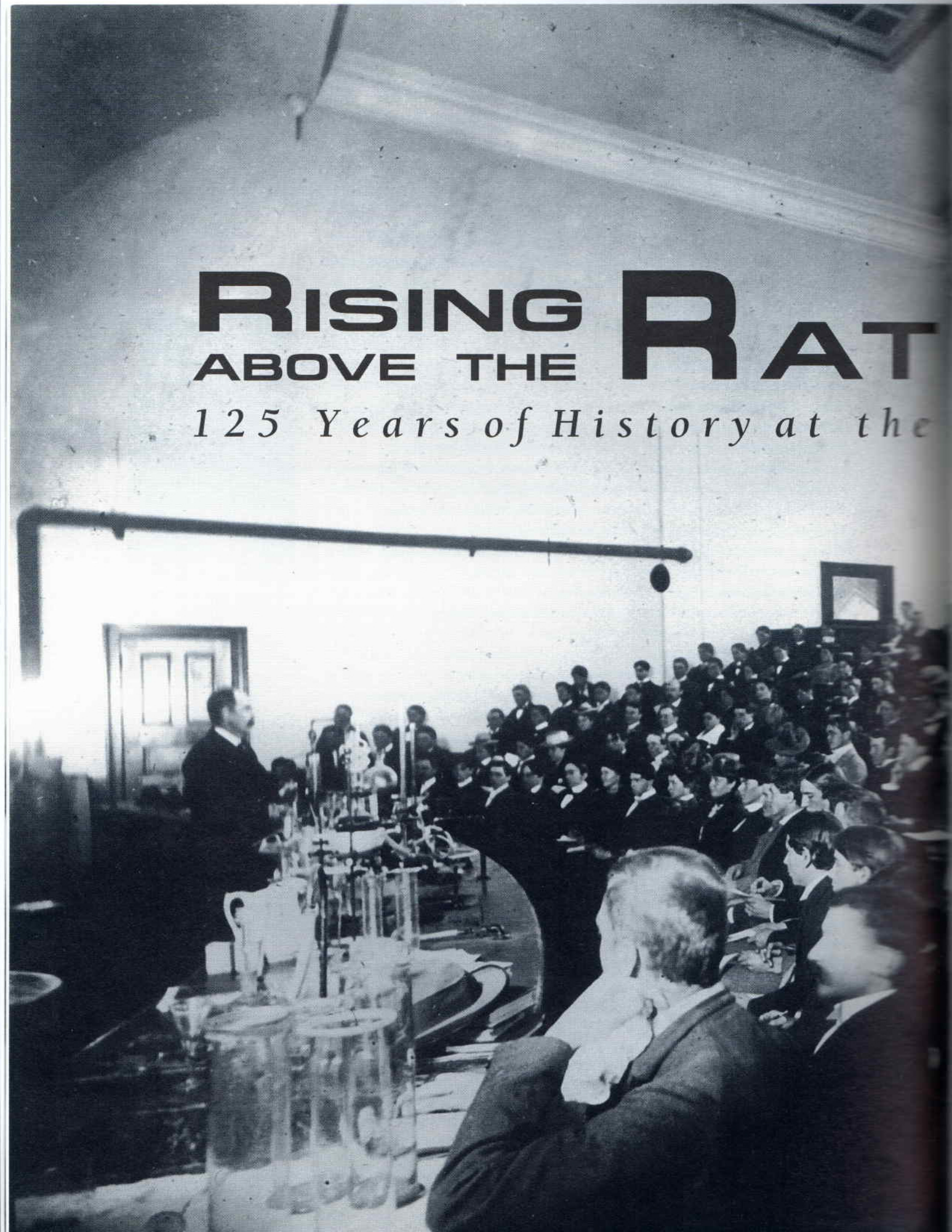


RISING ABOVE THE RAT

125 Years of History at the

House

College of Chemistry

Each building in the College of Chemistry is a chapter in its history, from its humble beginnings to its present eminence.

by William L. Jolly

The charter of the University of California was granted by the state legislature in 1868. At that time the University inherited a few buildings that had been occupied by the College of California in the neighborhood of Twelfth and Harrison Streets in Oakland. The teaching of chemistry was assigned to Professors Robert Fisher and Ezra Carr. Edmond (Eddie) O'Neill (who later joined the faculty of the College) went as a boy to evening lectures by Carr, who presented the elementary principles of chemistry, illustrated with experiments. O'Neill said, "It fired my imagination and gave me my first insight into the charm and interest of science."

Daniel Gilman was inaugurated president of the University in 1872; in that same year he convinced the state legislature to adopt a "Political Code" that provided the University with a College of Chemistry, and he hired Willard B. Rising to serve as "head" of the College. Hence in 1997 we celebrate the 125th anniversary of the College of Chemistry.

South Hall, the first building of the Berkeley campus, was built in 1873. More than half of it consisted of chemical laboratories which served the College of Chemistry for almost two decades. This building was constructed of quality materials; it survived the earthquakes of 1906 and 1989, and now houses the School of Information Management and Systems. The interior furnishings were built of California laurel; the laboratory desks were of black walnut, and the hoods were of plate glass. When completed, the laboratory was physically superior to any in America and was probably unexcelled by any in the world.

Of course, superior facilities do not guarantee superior activities. In those days the University was not first rate. It genuflected academically to older eastern schools as they, in turn, deferred to those of Europe. Some idea of the relaxed character of the campus in the nineteenth century can be gathered from remarks of O'Neill, who, when describing those days, said, "With the smallness of the classes and the lack of distracting avocations and activities, now unhappily so prevalent, we could devote ourselves to study and reflection and discussion in a liesurely way which now no longer is possible. The

Left: Chemistry Professor Willard B. Rising lectures in the Old Chemistry Building c. 1900

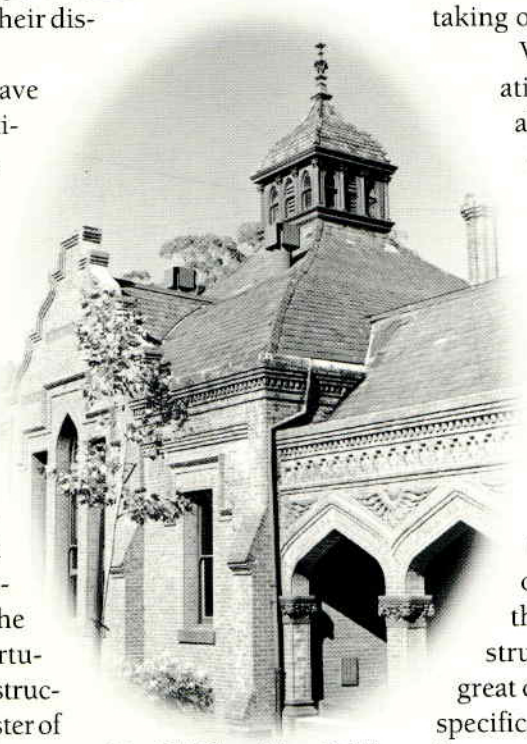
closeness of association of professor and student, so often referred to by the old graduates, was the rule. The small college in the midst of uninhabited fields of Berkeley had a charm that can never come again."

John Stillman painted a less romantic picture:

"The career of the chemist in those days offered few inducements and little of promise. The Pacific Coast in particular still lingered in the epoch of exploitation of its rich natural resourses in gold and silver, grain, cattle, and timber. The occupation of chemist meant to the general public little more than that of assayer of gold and silver, or pharmacist. Outside of mining, the chemical industries were few and were conducted primitively and on traditionally established lines. Indeed, the chemical industries of the whole United States were largely contented to depend upon the scientific and technical achievements of Europe.

"Those were the years of sacrifice and of many trials for the little band of teachers with advanced concepts of university education and for their relatively few but very earnest supporters in California. Isolated by distance from sympathetic co-workers in the Eastern States, struggling against public apathy, and battling against attempts to obstruct their aims or to divert from the young University its needed financial support, their disappointments were frequent and their discouragements many."

The public apathy could not have been severe, because in 1890 a beautiful large brick building containing a lecture hall, numerous laboratories for instruction and research, and faculty offices (some furnished with fireplaces) was erected for use by the College of Chemistry. This building, later known as the "Old Chemistry Building," remained in use until 1963, when it began to be torn down in preparation for the building of Hildebrand Hall. Of all the buildings which have been built exclusively for the College of Chemistry, the old Chemistry Building was the most architecturally pleasing. Fortunately, its cupola was saved from destruction and is now perched among the cluster of modern buildings that house the College.



The Old Chemistry Building

During the early years of the University, Irving Stringham, a professor of mathematics, performed the duties of the Dean of the Academic Colleges, which encompassed the College of Chemistry. So, in effect, Stringham was the first dean of our College. However, the Academic Colleges were reorganized into autonomous entities in the early 1890s, according to the following plan:

A. The Colleges of Liberal Culture
   (1) The College of Letters
   (2) The College of Social Sciences
   (3) The College of Natural Sciences
B. The Colleges of Applied Science
   (1) The College of Agriculture
   (2) The College of Chemistry
   (3) The Engineering Colleges
      (i) The College of Mechanics
      (ii) The College of Mines
      (iii) The College of Civil Engineering

In 1896 Professor Willard B. Rising was finally designated as dean of the College of Chemistry. Rising had spent the preceding 24 years running the College, so he didn't require a breaking-in period before taking over.

When Gilbert N. Lewis was negotiating in 1911 with President Wheeler about the terms of his accepting the deanship of the College, he wrote Wheeler a letter with the following recommendations:

"It seems desirable that work should be begun as soon as possible upon a permanent building to house all of the advanced work in Chemistry and to constitute a wing of the ultimate Chemistry Laboratory. There is a plan in the Architect's office of such a building which would, in outline, represent the demands of the Department. The details of construction must be considered with great care and it is probable that the final specifications could not be prepared before next Fall. After that time, however,

the work of construction should proceed with all possible speed.

"During the time of construction of this permanent building, the work of instruction would be seriously hampered and no quarters could be provided for the new members of the instructing staff without extension of the present laboratory facilities. I therefore recommend the erection, at once, of a cheap, temporary building of wood, with two stories, each 1500 square feet in area and a basement of 900 square feet. This would provide for the laboratory courses in Physical Chemistry, special rooms for research, private rooms for new Instructors, and a machine shop. The space now occupied by Physical Chemistry in the old building, about 1600 square feet, would thus be set free for a much needed extension of the Freshman Laboratories. I should estimate that the total cost of this temporary structure, including the cost of Chemical tables, plumbing, concrete piers etc., would not exceed $7000 at the most. About $2000 would be needed to equip the new addition to the Freshman Laboratory in the old building. Plans can be made for the temporary building immediately, and the structure could be finished in ample time for the beginning of the next academic year.

Freshman chemistry laboratory, 1953.

"The new temporary structure should be built near the old laboratory, preferably in the small plot of land between the old laboratory and the road."

The "wing" of the Chemistry Laboratory was never built; however an entirely new building, Gilman Hall, was completed in 1917 and has survived to the present day. It is significant that Gilman Hall is named for a man who played an important part in the establishment of our College.

The "temporary structure" alluded to by Lewis was built in 1915; it was formally called the Chemistry Annex, but eventually became known as the "Rat House" and was demolished in 1963 along with the Old Chemistry Building when the construction of Hildebrand Hall commenced.

No significant changes to the Old Chemistry Building were made to accommodate more freshmen; instead, a three-story wooden structure with about a dozen teaching laboratories was erected in 1914. This Freshman Chemistry Laboratory, although considered adequate in those days, was quite unsafe by modern standards. There was no ventilation except that provided by windows. When students had to saturate solutions with hydrogen sulfide during qualitative analysis, they simply went out onto a balcony on the north side of the building, where hydrogen sulfide stopcocks were provided. The poisonous gas was distributed throughout the neighborhood by whatever breezes were present. Nevertheless, this laboratory remained in use until 1962, when Latimer Hall was completed.

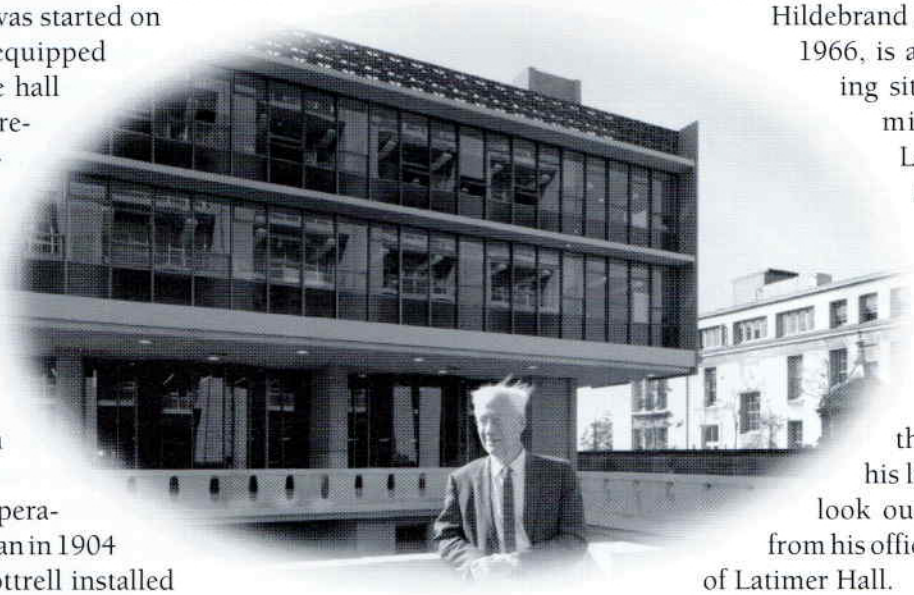
Another structure that assuaged the space demands of incoming freshmen was the Chemistry Auditorium, built in 1913. For almost 50 years this was used for lectures to many thousands of students in Chem 1A and 1B, principally by Joel Hildebrand.

After the completion of Gilman Hall, no official chemistry building was built on the campus until after the war. However, from about 1936 to the present, nuclear chemists and physicists, or chemists alone, have been conducting research in numerous buildings belonging to the Radiation Laboratory, now the Lawrence Berkeley National Laboratory.

Most of these buildings were constructed up on the hill; however, at least one substantial building was erected on the main part of the campus. For example, in 1963 (two years after Professor Melvin Calvin received the Nobel Prize in Chemistry—see page 28) a building, specially designed by Calvin, was erected to house the Laboratory of Chemical Biodynamics as part of the

Lawrence Radiation Laboratory. In 1980 the name was changed to the Melvin Calvin Laboratory.

During World War II, it was recognized that there would be a great surge in new students immediately after the war, and that the College facilities would be overtaxed. Hence, even before the end of the war, construction was started on a new building, equipped with a large lecture hall and laboratories for research and undergraduate teaching. The building was finished in 1948 and was named Lewis Hall, in honor of the illustrious scientist who put our College on the map.



Joel Hildebrand in front of Hildebrand Hall in 1966.

The Low Temperature Laboratory began in 1904 when Frederick Cottrell installed a liquid air plant. In 1913 Lewis and Gibson embarked on a general program of low temperature research that was imaginatively extended by William F. Giauque over a period of some 60 years. In 1954, five years after Giauque won the 1949 Nobel Prize, a special building was constructed to house the Low Temperature Laboratory, but this building was not called the Giauque Low Temperature Laboratory until a special dedication in 1966. Superconducting magnet technology rendered the Giauque Laboratory obsolete, and in 1985 the laboratory was renovated to accommodate other research.

During the 1950s and early 1960s, research was booming in our College, but under very cramped and dangerous conditions and, in some cases, with poor equipment. Just consider the fact that, in the Old Chemistry Building and in most of Gilman Hall, there were no fume hoods. Thus there was plenty of evidence that we needed new facilities. In those days, the state was generous in its support of Science, and approval was obtained for three new structures: Latimer Hall, Hildebrand Hall, and the Physical Sciences Lecture Hall.

Latimer Hall is an enormous building (111,800+ square feet) with eight floors, two basement levels, and a ninth-floor penthouse (added in 1989 to accommodate the research of Peter Schultz). When Latimer Hall was dedicated in 1962, the ceremonies were briefly interrupted by a volley of firecrackers in memory of Latimer's habit of celebrating important occasions with firecracker explosions.

Hildebrand Hall, completed in 1966, is an attractive building situated right in the midst of Lewis, Latimer, and Gilman Halls and Giauque Laboratory. It is one of the few campus buildings named after a person before his death. During the last 17 years of his life, Joel was able to look out on his own Hall from his office on the south side of Latimer Hall.

The Physical Sciences Lecture Hall was designed in part by physicist Harvey White, largely for use in the teaching of chemistry and physics. When built, in 1964, it was remarkable for having a rotatable stage with three lecture-demonstation tables, allowing demonstration apparatus to be set up or dismantled on two tables while a lecture was being given at a third. George Pimentel gave many freshman chemistry lectures in that hall, and in 1994 the hall was dedicated as Pimentel Hall in a ceremony followed by a celebratory lecture by Carl Sagan.

We are about to celebrate the completion of Tan Hall, the newest building in the College of Chemistry and the first of our buildings to be named after a person not closely connected with the College. The late Tan Kah Kee was a selfless Chinese industrialist and philanthropist; his family, friends and admirers in Southest Asia pledged $8.5 million for the hall's construction. A further $18.5 million in private donations from individuals, foundations and corporations plus $13 million from the State of California make up the total building project cost. This modern teaching and research facility will play a significant role in sustaining the excellence of the College of Chemistry into the next century.

Faculty Memorials

Melvin Calvin was born in St. Paul, Minnesota, on April 8, 1911. He received his B.S. degree from the Michigan College of Mining and Technology in 1931 and his Ph.D. in chemistry from the University of Minnesota in 1935. Dr. Calvin spent his entire career at Berkeley, where he joined the chemistry department faculty in 1937. He retired in 1980 and died on January 8, 1997.

It was as a postdoctoral fellow in Michael Polanyi's laboratory at the University of Manchester that Dr. Calvin began "following the trail of light" that was to guide his research for the next 55 years. This trail led to the use of radioactive carbon-14 to elucidate the path of carbon in photosynthesis. This critical work earned him the Nobel Prize in Chemistry in 1961 and the title of "Mr. Photosynthesis," and today the cycle of photosynthetic reactions is known as the Calvin cycle.

The trail of light also led to work in organic geochemistry, the chemical evolution of life, chemical carcinogenesis, and analysis of moon rocks. Dr. Calvin was also instrumental in spurring research on the conversion of solar energy into useful forms of power.

Dr. Calvin designed the Laboratory of Chemical Biodynamics, which he directed from 1960 until his retirement in 1980, when it was named in his honor.

The author of seven books and more than 500 scientific papers, Dr. Calvin served on many scientific boards, including the President's Science Advisory Committee for Presidents Kennedy and Johnson, and the Committee on Science and Public Policy, which he chaired, for the National Academy of Sciences.

Dr. Calvin is survived by his daughters, Elin Sowle and Karole Campbell; his son, Noel; a sister, six grandchildren and two great grandchildren. His wife and frequent scientific collaborator of nearly 45 years, Genevieve, died in 1987. The Melvin Calvin Memorial Fund has been established in his honor in the College.

Professor William G. Dauben was born in Columbus, Ohio, in 1919. He received his B.A. degree from Ohio State University in 1941 and his A.M. (1942) and Ph.D. (1944) degrees from Harvard. He joined the Berkeley faculty in 1945 and retired in 1990. He died January 2, 1997.

Professor Dauben's research interests centered primarily on the structure and synthesis of alicyclic compounds, with particular emphasis on stereochemistry and photochemistry. He was known for his work on polyene photochemistry, particularly with vitamin D. He trained more than 200 graduate, undergraduate and postdoctoral students.

Professor Dauben was a member of the National Academy of Sciences and the American Academy of Arts and Sciences. He was twice a Guggenheim Fellow and was honored by the ACS with the California Section Award, the Ernest Guenther Award, and an Arthur C. Cope Scholar Award. Upon his retirement from active teaching in 1990, Professor Dauben was awarded the Berkeley Citation.

Professor Dauben served with the National Institutes of Health, the National Science Foundation, and on the editorial boards of several scientific journals. From 1977 to 1981 he chaired the Chemistry Section of the National Academy of Sciences and from 1981 through 1987, he was a member of the U.S. Committee for the IUPAC.

Professor Dauben is survived by his wife, Carol, his daughters Barbara Baumer and Ann Klaus, and two grandchildren. A memorial fund in his name will support graduate and postdoctoral education in the Chemistry Department.

Professor George Jura was born in New York City in 1911, but he was raised in Chicago. He received his B.S. degree in 1939 from the Illinois Institute of Technology and Ph.D. from the University of Chicago in 1942. After spending four years on the staff in Chicago, he joined the Berkeley faculty in 1946 and he became Emeritus in 1979. He died January 25, 1997.

His first research was in surface chemistry after doing his thesis work with Harkins in this field. He later worked both in high pressure physical chemistry measuring heat capacities and conductivities of metals near 100,000 atmospheres on the properties of small particles. He directed the research of about 25 Ph.D. students and several postdoctorals.

He and his wife, Rose, loved the desert and they spent several periods in Tucson. They collected desert plants and Kachina dolls and had an extensive collection of each in their Kensington home. Eleven years ago they moved to San Diego. In addition to Rose, Professor Jura is survived by three sons who live in the Los Angeles area.