HISTORY OF THE CHEMISTRY DEPARTMENT

UNIVERSITY OF CALIFORNIA

LOS ANGELES

It now seems desirable to record some of the historical details connected with chemistry before these are entirely forgotten. For completeness, a brief survey of the two institutional precursors of the Southern Branch is included. Since the present writer had been connected with the Los Angeles division of the University for the latter ninety-five per cent of its life span, he got the job of narrator.

With an extensive chemistry library now at hand, it seems to be unnecessary to present an abstract of the thousands of pages of dissertations and journal articles describing the researches of the department. Instead, this script is primarily a chronicle of human experiences. It is meant to be informative or respectful of academic and administrative dignity. Not all of it is important. Presumably there should be condensation before it might be considered for publication as an edition of more than the present three pages. In any case, however,
PREFACE

Forty years have now passed since pioneer educator Ernest Carroll Moore faced the reluctant members of the Board of Regents, University of California, and persuaded them to establish a "Southern Branch" of their institution. It now seems desirable to record some of the historical details connected with chemistry before these be entirely forgotten. For completeness, a brief survey of the two institutional precursors of the Southern Branch is included. Since the present writer had been connected with the Los Angeles division of the University for the latter ninety-five per cent of its life span, he got the job of narrator.

With an extensive chemistry library now at hand, it seems to be unnecessary to present an abstract of the thousands of pages of dissertations and journal articles describing the researches of the Department. Instead, this script is primarily a chronicle of human experiences. By no means is all of it grave or respectful of academic and administrative dignity. Not all of it is important. Presumably there should be condensation before it might be considered for publication as an edition of more than the present three copies. We note, however,
that any suggestion to our chemist alumni that this particular manuscript edition be "recrystallized with rejection of mother liquor" meets unanimous disapproval. The old graduates wish an unexpurgated script.

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The author wishes to express thanks to the following persons for assistance of various kinds:

Francis E. Blacet, Bettileee Byars (Title Insurance and Trust Company of Los Angeles), Wm. R. Crowell, Ellen S. Dunlevy, Brainerd Dyer, Andrew J. Hamilton, Frank J. Klingberg, James D. McCullough, Loye Holmes Miller, Lawrence Clark Powell (and staff in "Special Collections"), Wm. T. Puckett, Carmelita B. Stanley, Hosmer W. Stone, Charles W. Waddell and Harry D. Williams.

G. Ross Robertson

September, 1959
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CHAPTER 1

ACADEMIC FORERUNNERS OF THE UNIVERSITY IN LOS ANGELES

One hundred years ago there was no college, no institution of higher education, in southern California. Probably there was none of real academic standing on the Pacific coast. Even the pioneer Roman Catholic Church had not yet established its historic St. Vincent's College (1865), now merged with Loyola.

As a striking contrast one may now note the statistical enrollment report of the federal Department of Health, Education and Welfare for the fall of 1958, indicating that there were approximately 221,000 young men and women attending college in the ten southern counties, Santa Barbara to Imperial. This tally excludes a number of conservatories, art institutes and other special terminal schools whose entrance requirements are probably not significant.

At this point it is interesting to note Uncle Sam's figures for total population (1860) of the region now politically divided into the present ten counties. This count was, at least approximately, 24,000 souls. Uncertainties of census figures for bonanza mining
Los Angeles in 1857 (Courtesy Title Insurance and Trust Company, Los Angeles, and John Howell, San Francisco)

Los Angeles in the 1870's (Title Ins. Tr. Co.)
towns as well as of county borders makes precision scarcely possible. In any event, one may say that the present college population is nine times the total population at the start of the Civil War. Incidentally, the present-day tally in the South comprises about 60% of the college enrollment of the entire state.

Now, to get a bit closer to the beginning of western chemical education, one may examine the history of the place known in early days as "La Ciudad de Nuestra Señora la Reina de los Angeles." In this municipality, which was scarcely out of the pueblo stage, even in 1880, there was no public college, despite the fact that the golden state had already been a member of the federal Union for thirty years. The real urban center was San Francisco. To be sure, a century and a half ago Los Angeles had been a significant competitor of San Francisco, but the southern pueblo then fell behind while the Bay region was profiting from the gold rush. A perusal of more recent census reports suggests, however, that the northern city has lost the race.
### Population - United States Census

<table>
<thead>
<tr>
<th>Year</th>
<th>Los Angeles</th>
<th>San Francisco</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>4,385</td>
<td>56,802</td>
</tr>
<tr>
<td>1870</td>
<td>5,728</td>
<td>149,473</td>
</tr>
<tr>
<td>1880</td>
<td>11,183</td>
<td>233,959</td>
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<tr>
<td>1890</td>
<td>50,395</td>
<td>298,997</td>
</tr>
<tr>
<td>1900</td>
<td>102,479</td>
<td>342,782</td>
</tr>
<tr>
<td>1910</td>
<td>319,198</td>
<td>416,912</td>
</tr>
<tr>
<td>1920</td>
<td>576,673</td>
<td>506,676</td>
</tr>
<tr>
<td>1930</td>
<td>1,238,048</td>
<td>634,394</td>
</tr>
<tr>
<td>1940</td>
<td>1,504,277</td>
<td>634,536</td>
</tr>
<tr>
<td>1950</td>
<td>1,970,358</td>
<td>775,357</td>
</tr>
<tr>
<td>(Forecast)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td>2,475,000</td>
<td>775,000</td>
</tr>
</tbody>
</table>

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**A New School in Sight**

As the eighteen-eighties started to unroll, a faint light appeared on the Los Angeles county horizon, thus giving the first hint of the great institution to be developed in the western part of the city. A group of civic leaders decided that they wanted an institution for teacher training; a "normal school," as the quaint terminology of earlier days specified. The City refused to finance the deal, and so a group of west-side private
citizens chipped in the formidable sum of $7,500 to buy a site. This was better than the folks east of Los Angeles River could manage. A high-level orange "ranch" just west of the dead end of Fifth Street, between Hope Street and Charity Avenue (now Grand Ave.) was available at $8,000. The owners of the "ranch," Messrs. Prudent and Victor Beaudry, brothers, decided to contribute $500 by the simple device of cutting their price to $7,500. The seller was "prudent" enough to reserve to the Beaudry estate the oncoming crop of seedling oranges, but the educational promoters got the orchard. Incidentally, the Beaudry family has long since been immortalized in the christening of Beaudry Avenue near Figueroa Street.

The struggle now began to establish a school on the new 5-acre plot. Of course the wise statesmen of "California" (that is, northern California) would not have sanctioned a normal school controlled by the intellectually immature southern metropolis of but eleven thousand souls. Nevertheless, approval was at last given by the Legislature of 1880-1881 to the munificent appropriation of $50,000 to build the necessary single building. It was ruled, however, that this was only for a "Branch of the State Normal School of San Jose." Accordingly, "Branch State Normal School" became the
name of the new institution in everyday parlance. As a political achievement this seems to have been outstanding in the face of the disaster which had befallen the San Jose school in 1880, when the main building at the northern site was destroyed by fire at a loss of $285,000, presumably without insurance, as is customary with state property.

In the meantime the new building in Los Angeles was constructed on the slightly hill location so that it looked eastward along Fifth Street in the direction of Olive, Hill, etc. streets. In later years, after the institution was moved to 355 North Vermont Avenue, the normal-school plant was razed, most of the "Normal Hill" cut down to street grade, and Fifth Street was extended through to Figueroa Street. Part of the property, north of the 5th Street extension, was purchased by the Southern California Edison Company as a site for their California headquarters. The section south of Fifth Street was taken over for the new plant of the Los Angeles City Library.

Returning to the early eighties, one notes considerable opposition to the Fifth and Grand site for the Branch Normal School. It was held by many to be "too remote from the business district" and thus inconvenient. One must remember, of course, that the
Original Building of the State Normal School as it Appeared in 1890

(Title Insurance and Trust Co.)

The business center of Los Angeles at that time was some distance north of the present City Hall. But nobody proposed any better location for the school.

On August 29, 1882 the new school was opened. Testimony is not quite certain as to enrollment, but apparently about 61 "pupils," from outside towns as well as Los Angeles, showed up on the opening day. This number seems to have grown to 80 in a few days, and to 126 for the final total of the academic year.
A faculty roster of three was at hand, with Charles H. Allen as Principal of both the headquarters establishment at San Jose and the Los Angeles branch. C. J. Flack of the Los Angeles staff served for the first year as deputy administrator without glory of title. Next year, 1883, Mr. Ira More became Principal at Los Angeles.

The curriculum of the new institution promised some attention to chemistry, but this branch of science was not due for favorable development. Actually chemistry was headed for slump, not boom, in the thirty-seven years yet to pass before entry of the University of California on the scene. One must not forget, however, that the University of California in 1882 was itself a child among colleges, only fourteen years of age.

In the first announcements there was no attempt to designate the subject specialty of the "teacher." It seems, however, that Mr. J. W. Redway should be credited as the first faculty member in chemistry. By the second year, at least, Mr. Redway was formally listed as Teacher of Chemistry and Physics. Brief information as to the curriculum was given, indicating that chemistry was to be taught in the Middle Year of the three-year normal-school program, second term only. "Chemistry by lectures, covering an outline of chemical laws, with
illustrative experiments" was promised. In the third or Senior year, first term only, there was announced "Review of chemical laws, and the study of a few chemical elements, with illustrative experiments. Candidates for admission to the Senior Class are examined on the first twenty-two chapters of Mead's Primer of Chemistry."

No suggestion appears as to the nature of the examination on Mead's Primer, but many questions in other subjects, both of science and humanities, were presented in catalogs of the eighties for the edification of prospective students. Some of these questions were not very impressive. We are indirectly reminded of the current blast of criticism against modern schools for asserted defects in educational method. The eighteen-eighties also incur criticism, but of a different sort. Examination questions, both science and non-science, heavily emphasized pure memory: "Name five countries," "give six animals," or list seven battles, usually without attempt to explain how or why.

Chemistry equipment of 1883 was extremely simple, and there is no evidence of a student laboratory. A few demonstration experiments performed in a single room had to suffice until the building program of 1892-1894 could be put through.
For the academic year 1884-1885, Miss Sarah P. Monks took over in chemistry, zoology and drawing. On January 13, 1885 the Principal formally announced in faculty meeting that Cooley's textbook of chemistry was officially adopted. "Qualitative Analysis and Household Science" appeared as an offering in the Senior year. The editor of the Catalog ventured a little educational philosophy with the words - "We aim to teach subjects, not books." The editor conceded, however, that somewhat better advancement was attainable with a textbook than without. The paragraph goes on to record adoption of "Wentworth's Plain(sic) and Solid Geometry," presumably as (a) simple, (b) substantial mental fodder for the youth. At this point we recall later educational maxims, such as "We teach children, not subjects!"

Incidentally, the tally of 1/8 male students was reported. Miss Monks continued in chemistry until 1888, when with expanding classes she withdrew to a program in zoology and drawing only.

By 1885 the plan was adopted of requiring each student to present an "oration." The record of Oration titles of course includes many in education and the humanities. No trace could be found of any student who had the temerity to deliver an oration in chemistry.
The Catalog now boasted that the school was "supplied with most of the apparatus needed" in chemistry. Much more attention, however, was given to the meticulous rules applying to the achievement of board and room by the student. Estimated cost - $30 per month, but under the following strict regulations:
(a) no gentleman may board at the same house as ladies, (b) exception for a brother and sister (c) no other gentleman or lady may board at the house where the brother and sister dwell.

As the years passed the Branch idea in the school name became less palatable, just as "Southern Branch" would become in the nineteen-twenties. In 1887, independence of the San Jose Normal School was declared, but Mead's Chemical Primer was again proclaimed as the established authority in chemistry. In the senior year there were Qualitative Analysis, first term, 16 weeks, Applied Chemistry and Mineralogy, 12 weeks, and no chemistry in the third term of 12 weeks. In 1888, following limitation of Miss Monks' duties, the chemistry was taken over by Miss Helen Cooley, who also handled physical geography.

By 1889 the presence of chemistry in the one building of the school had become offensive. Said Principal Ira More, in 1890 - "A separate building for the
chemistry and physics laboratory is much needed…….

….remove the chemistry to a place where the constant experimenting, made necessary by the practical teaching of today, should not be an 'ill savor filling the nostrils of the people.'" Ventilation, particularly power-driven ventilation, either had not been invented, or had not been thought of, or both.

The Principal then took occasion to lodge his vigorous complaint with the Board of Trustees, despite the fact that this body didn't have any money to use on the project. "You voted to ask the coming Legislature for $10,000 to build a chemistry laboratory separate from the present school building, thus…..returning the present laboratory room into a school room. But our representatives failed to secure anything, though the School at San Jose secured an appropriation for building purposes of $37,000, and Chico an appropriation of $25,000 for the same purpose." It is of course entirely possible that Los Angeles was not very powerful politically in state affairs.

In 1892 Mrs. May A. English was appointed as teacher of chemistry and physical geography, and the new appointee continued until 1907. The administration struggled in quest of new building space, and at long last the Legislature of 1893 appropriated the sum of
Enlarged Structure as it Appeared in Later Years; View From Position Near Biltmore Theater

$75,000 for enlargement of the Los Angeles Normal School, as the institution was now called. To any reader who has had "post-Korea" experience in the financing of college building jobs, the record of 1893 for a substantial brick building is almost incredible:

3 stories, gross floor area 80' x 180'
80' x 180' x 3 = 43,200 square feet
gross floor area

Separate chemistry laboratory:
30' x 40' = 1,200 square feet gross
Total gross 44,400 square feet
Unfortunately the $75,000 ran out before the furniture for the chemistry laboratories, plus a few apparatus sundries, were funded. Next year a supplementary appropriation yielded about two thousand dollars (rough estimate) for the laboratory equipment.

Summary:

Building and built-in furniture $77,000
Floor area 44,400 sq. ft.
"Net useful" area (slightly under 2/3 of gross area) estimate = 29,000 sq. ft.

$77,000 divided by 29,000 = approximately $2.65 per square foot net useful floor area.

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A comparison with cost figures of later buildings is illuminating. One must concede, of course, that the equipment of later structures was more extensive, and the quality far better:

<table>
<thead>
<tr>
<th>Cost per sq. ft. net useful area</th>
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<tr>
<td>Normal-school building, 1892</td>
</tr>
<tr>
<td>Laboratory buildings, about 1910</td>
</tr>
<tr>
<td>Chemistry building, south wing, UCLA, steel, concrete and brick (1934)</td>
</tr>
<tr>
<td>Chemistry building, UCLA, post War II but pre-Korea (1950)</td>
</tr>
<tr>
<td>Geophysics-geochemistry addition, post-Korea costs (1958)</td>
</tr>
<tr>
<td>Current rough estimates being used by architects, chemistry (1959)</td>
</tr>
</tbody>
</table>
With a new laboratory established, the School decided to recommend several chemistry texts simultaneously, and announced a chemistry fee of $3 per term. The following precepts were published for edification of patrons:

"It is desired that the course be extremely practical; the graver technicalities of the science are avoided, and the students are led to use the facts and general principles learned in explaining common processes and phenomena.....no branch of science.....of more benefit to the community, if it were properly understood and applied, than domestic and household chemistry - scientific cookery and cleansing........ students are carefully instructed in the best methods of soup and bread making.......sterilization of milk and water....."

By 1896 enrollment in the School reached 498, and the chemistry laboratory had been provided with built-in furniture with plumbing attached. Impressive pictures of the principal and preceptress in their respective offices were published each year, but no space was available for chemistry questions among the samples offered in a variety of fields. Nevertheless, in 1898 the Board of Trustees took occasion to boast, in their annual report, that the School was the leading
educational institution in southern California.

In 1900 chemistry was divided into two courses; first a "very elementary" course in the beginning or "Junior" class, term B. A "more technical course" followed in middle C term. Three hours was the time allowance for either course, one hour class exercise, two hours laboratory work. The capacity of the laboratory was 40, with no hint of space economy by use of sections. With a building costing less than $3 per square foot, space economy was probably not considered significant.

As the Normal School continued into the twentieth century, the prestige of chemistry at 5th and Grand, never very high, waned perceptibly. As the new president (Millspaugh) was appointed, chemistry even lost its place as a subject worth mentioning in the annual catalog.

In 1904 there appeared the name of Loye Holmes Miller in "Biology and Nature Study." This young instructor was later to head a "department of science". In due course it would be his duty to hand over the administration of one of his subdivisions to William Conger Morgan as the new University of California, Southern Branch, would be established. Following such transfer Miller would then concentrate his efforts in
his own special field of zoology as a staff member of the new University campus. This led to the chairmanship of zoology and the honor of being the first Faculty Research Lecturer.

By 1907 chemistry disappeared not only from the general discussion of courses and subjects in the Catalog, but also from the faculty name-subject list. Mrs. English was tagged for mathematics and physiology only. Finally practically all suggestion of chemistry went out, and in 1912 General Science was listed as the important feature. During this period the subject of chemistry seems to have been buried in the affairs of home economics, which was to carry on until the advent of the Southern Branch of the University. In the meantime, however, a movement to get out of the Grand Avenue plant was making great headway:

1907. Sale of the Grand Avenue school property authorized by the Legislature.

1911. Appropriation to purchase a new site.

1912. Twenty-four acres purchased at the corner of Vermont Avenue and Willowbrook Avenue, southeast Hollywood.

Nov. 18, 1913. Cornerstone of Millsap Hall laid, Vermont Avenue campus.

September, 1914. New buildings occupied.
With the new buildings occupied, the name of Miss Florence M. Hallam appears as Instructor in Chemistry and Bacteriology. Courses were offered in "General Chemistry," "Food Production," "Food Chemistry 1 and 2," and "Household Chemistry." Miss Hallam's title was changed each year:

Instructor in Chemistry and Bacteriology, 1914.
" in Home Economics 1915.
" in Chemistry and Home Econ., 1916.
" in Chemistry and Physics, half time, and manager of the cafeteria, half time 1917.
Instructor in Chemistry and Physics 1918.
Manager of Cafeteria (after installation of the University 1919.)
CHAPTER 2

THE UNIVERSITY ESTABLISHES A SOUTHERN BRANCH

As World War I drew to a close, the influence of the president-elect of the Normal School, Ernest Carroll Moore, began to be felt in a political way—and particularly pointed at affiliation with the University of California. It is beyond the scope of this narrative to elaborate fully on this subject. Dr. Moore himself has written a book describing the struggle.

An early hint of the direction in which the breeze was blowing is seen in the visit of President Benjamin Ide Wheeler to southern California in June 1918 for a special public address. Said Wheeler, off guard for a moment, on June 20: "I think we can and ought to affiliate our two institutions." But Wheeler's friendly remark was only one piece of fuel to put on the fire.

On August 16 Regents Dickson, Rowell and Taussig inspected the Vermont Avenue plant, and debated the possibility of union. Next day, under this stimulus, the Normal School trustees gave the project a boost with considerably more enthusiasm. The normal-school
presidents' group, statewide, were not nearly so happy over Los Angeles' special new ambition. The subject was argued, back and forth, with apparently discouraging results, for months, or until the late spring of 1919. Toward the end Moore battled with conservative Regents of the University for a solid four days. At last he put a sting on his whip, saying—"Gentlemen, this is the one chance you have....that work is needed....if you do not provide it others will." Or as another narrator once quoted Moore to the present writer: "Gentlemen, this is the last chance you will have to retain control of the state university of the South!"

Whichever of these earnest statements is correct, it seems that the answer came from President Wheeler: "Moore is right!" Even at that the battle was not over. At last a bill was introduced into the 1919 Legislature and on May 24, 1919 signed by Governor Stephens. This bill repealed the act of March 14, 1881 "to establish a branch normal school," transferred the normal school property to the Regents of the University of California and made a small initial appropriation for operation of the new Southern Branch. With only a few weeks to go, one can readily understand that the organization, curricula, personnel etc. of the new institution had to
be thrown together on rather short notice. The tribulations of Chemistry alone will be enough to satisfy the needs of the present chronicle, and so we turn to the problems of Miss Hallam and the new assistant professor, William R. Crowell.

The advent of regular University of California curricula, and the transfer of Miss Hallam to cafeteria management, left the administration free to acquire new staff as well as courses. First in this program was W. R. Crowell, who in August 1919 received a wire from "Director" Moore (as he was now to be called) offering an assistant professorship, together with the preliminary commission to organize and initiate elementary college chemistry, in anticipation of the arrival of Professor William Conger Morgan, slated, but not yet signed up, as the new chairman for service starting July 1, 1920.

William R(ansom) Crowell, native of Massachusetts, completed undergraduate studies at the Massachusetts Institute of Technology (B.S. 1904) and served a term as chemist in the laboratory of the Boston
Edison Company. Later (1908) he was instructor in physics at the institution now known as Pennsylvania State University. From 1908 to 1911 he was first teacher, later principal of the Douglas, Ariz. High School. He then decided on graduate study (1914–1916) and was awarded the Ph.D. at Columbia University under the direction of M. T. Whitaker, with an industrial-chemical thesis on coal-tar oils. The years 1916–1919 found Crowell in a diversified program of both pure and applied chemistry in the old Los Angeles Polytechnic combined high school and junior college.

As Dr. Crowell took up duties on the Vermont-Avenue campus in the brand-new Southern Branch, about 85 chemistry students suddenly appeared on the scene. There was no systematically-designed laboratory; no assignment of lockers. Students came into the laboratory at any supposedly feasible hours, and did the classical experiments of Bray and Latimer as best they might. There was neither storekeeper nor laboratory assistant. From 8 a.m. until 5 p.m. the students came in turn to Dr. Crowell’s desk for individual questioning. After a few weeks one of the most competent students, Mr. Norman M. McGrane (later well-known chemical engineer for Western Precipitation Corporation) volunteered his services at the task of passing out apparatus. A few others later
joined the helpful McGrane.

Great confusion reigned. The supply problem was a nightmare. No organized budget had yet been created. Although the chemistry functions were theoretically in charge of the chairman of the science department, the actual supply problems resembled those of son Johnny "working" Dad for amusement money. Special permission of the Director was needed to buy chemical supplies at well-spaced intervals.

Qualitative analysis appeared in the spring term, and great was the odor thereof. No semblance of forced ventilation had even been thought of in the "Science" building inherited from the Normal School. At last Dr. Crowell succeeded in getting a giant electric fan installed in the west end of the building. The noise of this equipment brought down the wrath of the Director and the Assistant Director, and the offending fan was removed to the north side of the building, where it could co-operate with the Mohave northerns, which blew on some six or eight different days during the year. During such a norther the device was not needed anyway.

The one lecture room in Science Hall was shared by the animals belonging to Loye Holmes Miller and the noisome analytical mixtures prepared by W. R. Crowell. On one occasion a snail came to grief, ostensibly
investigating the antimomous ion(Sb^{+++}) content of the liquid in a test tube. By this time the Chemistry Department had a storeroom "approximately the size of a household pantry," according to legend of 1919-1920. In spite of all this, the versatile Miss Hallam found enough time away from her mounting cafeteria responsibilities to continue her course in elementary domestic chemistry for students of home economics; but this program was soon terminated as the University curriculum developed.

Incidentally, Dr. Crowell expresses his gratitude to the veteran of freshman chemistry administration and teaching at Berkeley, Professor Joel H. Hildebrand, who loaned him lecture outlines, visited him in the first critical winter of 1919-1920 and inspired him greatly.

Although the principal new courses in University chemistry were the prime responsibility of Dr. Crowell, the 1919 listings show a residue of the old Normal School curriculum also:

**QUARTER CALENDAR, THREE TERMS**

Chem. A  Elementary Chemistry, given by Adam A. Hummel, Instructor in Biology. Mr. Hummel had received training in agriculture, which had become quite in vogue in secondary education during the past decade.
Chem. C1A, C1B, C1C; general(freshman) chemistry, corresponding to Chem. 1A-1B at Berkeley. Given by W. R. Crowell; class roll for the first Chem. C1A was the following:

**Section 1**

<table>
<thead>
<tr>
<th>Bassett, Lila E.</th>
<th>Downs, Arthur</th>
<th>McGrane, N. M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear, Ben J.</td>
<td>Dudley, R. K.</td>
<td>Mosher, Mae</td>
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<td>Brundige, L. J.</td>
<td>Frick, F. H.</td>
<td>Ogden, H. S.</td>
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<tr>
<td>Cambern, Carroll</td>
<td>Godschalk, C. N.</td>
<td>Peirce, Gilbert</td>
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<td>Clark, D. C.</td>
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**Section 2**

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<th>Beymer, Chester</th>
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**Section 3**

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<td>Hall, Alfreda</td>
<td>Nichols, Howard</td>
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Chem. 11 Food Chemistry, given by Florence Hallam

Chem. 20 Applied Chemistry, " " " "

25
It is interesting to note in the foregoing list of students in the first Chemistry CLA class the names of certain professional workers of prominence in later years:

Leo P. Delsasso, Chairman, Physics Department UCLA.
N. M. McGrane, chemical engineer, Western Precipitation Corporation.
William Stephens, motion-picture actor.
Gerard Vultee of aircraft fame (Consolidated-Vultee, "Convair" products).
Jerrold Weil, judge of the Los Angeles Superior Court.

Administrative Changes

As the year 1919 advanced, President Millspaugh became seriously ill. Events proceeded rapidly. David Prescott Barrows was chosen President of the University of California on Dec. 2, and Millspaugh passed away on December 12. Ernest Carroll Moore, designated many months previously as the next president of the Normal School, and now Director of the University of California, Southern Branch, proceeded with negotiations for appointment of a scholar to fill the new post of chairman in chemistry. He had long since fixed attention on William Conger Morgan, professor at Reed College, Portland, Oregon, but ran into difficulties due to the inadequate salary scale then in force:
Professor  $2,500 to $4,000
Assistant Professor  1,400 to 2,500
Instructor  1,200 to 1,600

There followed a sequence of correspondence in which Director Moore endeavored to convince administrative authority that the World-War I step in inflation was really here. By February, 1920 he had succeeded, and Morgan signed up for new duties in the coming fall. In other words, the new chairman was to get considerably more than half as much salary, dollar-wise, as a new instructor gets in the University as these lines are written. Apropos of early-day economies, it is interesting to note that Dr. Moore used the back of a letter of enquiry from Dr. Morgan (or other correspondent) on which to have the carbon copy of his reply typed.
W(illiam) Conger Morgan (1874–1940), native of New York state, received the A.B. degree at Yale in 1896. As Silliman fellow he attained the Ph.D. in organic chemistry at Yale in 1899. After a short period of service as professor of chemistry at Washburn College, Morgan
was appointed to the chemistry staff of the University of California, Berkeley, where he served from 1901 to 1913. Following transfer to Reed College, Portland, Ore, he served as professor and chairman until 1920. The remainder of his career was then spent in Los Angeles, where he was professor and chairman, Southern Branch and UCLA, 1930-1940.

During earlier years, and particularly during his term of service at Berkeley, Morgan became widely known as a public lecturer in scientific fields. In 1910-11 special attention was paid on the northern campus to a program of popular science lectures by a group of local faculty members. In this program Morgan took the main burden of responsibility, to the relief of many other professors of natural sciences.

But Morgan's lecture fame was not confined to special public lectures. Many an old-timer in the alumni roster, north and south, including his former Chemistry 1A student, Robert Gordon Sproul, remembers the crisp Morganesque remarks, both in and after lectures; for example:

(On enrollment day) "Look at the fellow to the right of you, and the one to the left of you; by Christmas one of them won't be here!"

"Yes, I remember the one about the chemistry teach-
Morgan and party on a camping trip in the San Bernardino Mountains in 1923
er in the ladies' finishing school, who assigned her first chemistry lesson:— 'Learn the names and formulas of all the chemical elements, and their atomic weights!' No wonder they called it a 'finishing school!'"

This compliment for the present writer, bestowed about 1925: "Robertson has more useless information than any other member of my staff!" — One now wonders whether this remark has any connection with the authorship of the present chronicle.

On one occasion, when there seemed to be a dearth of good topics for conversation, a colleague criticized the researcher of some bygone day for inventing the clumsy name **phenolphthalein**, with four consonants awkwardly strung together in one syllable, namely **phth**.

"That simply shows your lack of a classical education," rejoined Morgan, remembering his own considerable training in Greek and Latin for the A.B. degree at Yale. "There are only two consonants there, phi and theta!"

One morning, after Chemistry 1A was well out of the way, Morgan found his customary seat at the round table in the faculty lunch room, and consumed the entree brought by Peggy, faithful regular waitress.

"How about some apple pie?" ventured Peggy.

"Is it any good? Is the crust decent? Any apples in it?" groused the cynical Morgan. Peggy of course
reassured him of the excellence of the pie.

"All right then - bring me a piece."

Interruption from young Dr. Jesse A. Bond, who was probably a bit cocky from his advancement to the associate professorship of education: "O Peggy, just bring Dr. Morgan the apples. He has enough crust already!"


At another lunch session Loyce Miller, leading zoologist of the luncheon crowd, expatiated on the serious and scholarly attitude of the summer session student, in contrast with the irresponsible regular student. "Summer students know what they want; all you have to do is to open a door, and they rush through it!"

Morgan, reflectively - "In which direction?"

On another occasion Morgan called two twin brothers, students in Chemistry 1A, on the carpet. "What was that disturbance going on this morning in the back row?"

Brothers (after timid looks at each other) "We are not sure whether the bet was on the number of 'F'r instances' in your lecture, or whether you were going to break the record!"

One of Morgan's tales recalled his undergraduate days at Yale, when, according to legend, he was enrolled under an extremely gullible professor of natural phil-
osophy. The following simple-minded recitation was
given as an example:

Professor. - "Here on the lecture table we have a
battery! Which is the zinc pole, positive or negative?
Mr. - ah- Doe."

John Doe. "Positive."
Professor. "Wrong!" (zero marked on the record)
(Morgan waves his long, rangy arm wildly.)
Professor. - "Yes, Mr. Morgan?"
Morgan. "I should think it would be the negative."
Professor, pleased. "Correct!" (100% for Morgan.)

Some philosopher of early days once exclaimed -
"Tobacco is a nasty weed, I like it!" Perhaps that
might have been Morgan, who during his lifetime of
sixty-six years consumed a substantial amount of Nicoti-
ana tabacum. Though the quantity was ample, the quality
was not of great importance. Either Havana Perfecto,
or El Ropo(to use student slang) would do, as long as it
was a cigar with satisfactory ventilation facilities.

With all this in mind, the Chemistry 1A crowd de-
cided one December to give their rigorous but popular
instructor some Christmas presents. As the professor
entered at 10:00 a.m. for the next lecture, he spied on
the lecture table a small pile of cigars. Before he
could start his technical remarks, numerous young males,
one by one, walked forward ceremoniously. Each deposited a cigar, bowed profoundly, and took his seat. Some of the cigars may have been "Havanas;" certainly others were Old Virginia Cigars, which the reader of advanced age will recall as once available at three for five cents. And according to legend, Morgan smoked the whole lot.

Morgan was never known as a research leader, but nevertheless maintained high scholarship standards, with consistent backing of his staff in a demand for serious student performance. As a result, students transferring — by necessity — to the northern campus, during earlier years, for completion of their baccalaurate training, made excellent records in the upper-division and graduate programs of the College of Chemistry at Berkeley.

Already foreseeing his new responsibilities, Dr. Morgan had tried to get Director Moore to launch a building campaign. On November 22, 1919 he requested a decision either to remodel the (comparatively new) Science Building on the Vermont Avenue Campus, or to build a new laboratory. To all this the Director demurred; the latter project in particular was "premature." Dr. Moore was working on the plan to get the Legislature
to provide 15 acres of adjacent land, and replied to Morgan that such grant was the utmost that the Legislature could stand at this time. Verily Dr. Moore had not realized what an educational giant - of the future - he had started on Vermont Avenue. The Director noted, however, that the University had decided to admit an additional 250 students for the next fall term, and conceded that something had to be done.

Now it happened that the federal government had built, on the Willowbrook Ave. end of the Vermont Avenue campus, a wooden shack, for barracks purposes, to suit the needs of the Student Army Training Corps of 1917-18. This shack, constructed of Douglas-fir boards, roofed with cheap tar paper, was now surplus property. Accordingly, on Dec. 5, 1919, Director Moore wrote to his nominee for chairmanship of chemistry a proposal that this humble structure be remodeled as a temporary laboratory.

To make a long story short, the renovation proposal was accepted by Morgan and the necessary appropriation secured from Berkeley authority to complete the job by summer of 1920. Construction, and part of the architectural advice, came from Alfred E. Davie, Superintendent of Buildings and Grounds. The following account was rendered for the job:
Capacity, 180 Chem. 1A or 1B students working at one time. Six deep pot drawers at each student station, thus permitting theoretical maximum capacity of 6 x 180 or 1080 different students simultaneously enrolled. Each drawer was controlled by individual combination padlock. This convenient, labor-saving lock arrangement is still (as of 1959) not understood or used by many architects who employ cabinet locks involving keys and resulting key nuisance, or with built-in cabinet combination-lock mechanism requiring hundreds of combination changes semi-annually. The following cost account was recorded:

Rough laboratory tables, fir, fir tops $3,657.60  
Fire escapes 187.00  
Interior finish 1,192.00  
Hoods and fans 2,137.00  
Partition in attic 43.00  
Office and storeroom 406.00  
Fire extinguishers 100.00  
Connections to sewer 290.00  
Gas connection to meter 196.00  
Water connections to supply 218.00  
Lecture table and incidentals 770.90  
Heating equipment (steam radiators) 2,250.00  

$ 11,650.00

Equipment:

3 Analytical balances 450.00  
1 Steam table 50.00  
1 Hot-air closet 150.00  
90 Filter pumps 180.00  
Apparatus, misc. for "advanced" work 1,100.00  

$ 1,920.00

Grand Total $ 13,480.00

The present writer begs to submit the above reckoning to the new Building Committee (1959) for comparison with their tally of needs for the Chemistry Building Addition.
Advent of all this wealth of equipment evidently required some paid assistance in the laboratory. There thus appeared in the budget an item of $50 per month to hire Norman M. McGrane, informal helper of the Science Building era, as Assistant in Chemistry. Still other helpers proved to be needed, and the total budget for such purpose, 1920-21, reached the unprecedented total of $1,800.

Budgets for 1919 to 1921 will still look rather small to present-day administrators:

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<tr>
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<th>1919-20</th>
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<tr>
<td>Professor</td>
<td>$</td>
<td>4,000</td>
</tr>
<tr>
<td>Assistant professor</td>
<td>2,250</td>
<td>2,500</td>
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<tr>
<td>Instructor</td>
<td>2,000</td>
<td>2,200</td>
</tr>
<tr>
<td>Assistants in chemistry</td>
<td>-----</td>
<td>1,800</td>
</tr>
<tr>
<td>Total salaries</td>
<td>4,250</td>
<td>10,500</td>
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<tr>
<td>Apparatus</td>
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<td>2,000</td>
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<td>Remodeling, etc.</td>
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<td>13,480</td>
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Number of students in chemistry 85 476

Already southern California was becoming aware of the Southern Branch, and enrollment mounted. In the new and larger Chemistry 1A class roll appeared the name of George Scofield, later to be a prominent engineer-contractor, with an A grade in the course. So outstanding was George’s achievement that on January 4, 1921 he was officially certified as Assistant in Chem-
stry with salary of $35.00 per month.

Other scholastic stars were the helpful Norman McGrane, top A in Chem. 8, 6A and 6B, also Louis Gunther, physician-to-be, in the A category. All of this was in spite of provoking delays in the launching of the new courses in quantitative analysis under Dr. Crowell, due to building troubles. The quarter calendar which had been used in 1919-20 had been abandoned in favor of the conventional semester scheme. Chemistry C1A-C1B-C1C became C1A-C1B. Chemistry 8 and 9, newly offered, added seriously to the teaching load of Professor Morgan, and led the institution to press for two new staff members.
CHAPTER 4

EXPANSION OF CURRICULUM WITH DEVELOPMENT
OF HOME ECONOMICS

As Morgan's first year at the Southern Branch approached completion, a new problem arose. With the aim of raising the standards of Home Economics to full university grade, Director Moore had secured the services of Dr. Isabel Bevier, recently retired as head of the home economics department at the University of Illinois. Dr. Bevier was widely known and highly respected in eastern circles; incidentally, the beautiful new home economics building (1956), at Urbana, is known as Bevier Hall.

In accepting the temporary post-retirement position at the Southern Branch, Dr. Bevier insisted on a material addition to the elementary chemistry which had been the sole offering of the Normal School on the Vermont Avenue campus. Sidetracking Chemistry 1A-1B, which would require too much student time, the Illinois scholar approved the introduction of a shorter sequence, Chemistry 2A-2B, which not only served as the first year of chemistry in the home economics curriculum, but also
met requirements in certain applied arts fields, and as general training in chemistry for non-science majors.

For the second year of the new curriculum, course 10, organic chemistry for home economics students, was authorized. Finally, chemistry 107, biochemistry, completed the new enriched program promoted by Dr. Bevier. Obviously all this required new staff, and two instructorships were approved for the coming academic year, 1921–22. Since no students were ready for the final (biochemistry) course, the plan was to launch only Chem. 2A, 2B and 10 during the coming year.

On June 3, 1921 the first of the two new instructors was named. Hosmer W(ard) Stone, native of Michigan, received the A.B. degree at the University of Wisconsin in 1916. Following this undergraduate period of study Stone completed short terms of service at the Columbia (Indiana)
High School, and in an instructorship at the institution now known as Pennsylvania State University. He then returned to the University of Wisconsin for a master's degree, and shortly afterward entered the U.S. Army Medical Corps, with a supplementary term of service in the Rockefeller Institute for Medical Research.

Returning once more to the University of Wisconsin, Stone studied for the doctorate in chemistry, receiving his degree in 1921. His thesis was in inorganic chemistry, with Professor Victor Lenher, under the title "Selenous and Selenic Acids."

Research interests of Stone have been directed to the analytical chemistry of chromium, particularly to the reactions of chromous ion. Activated carbon, and boron hydrides, have also been of interest. In 1932 Stone spent a sabbatical term at Minnesota, in collaboration with I. M. Kolthoff, with emphasis on oxidation. In 1939 he worked in Denmark with Einar Biilmann, Danish chemist who developed the "quinhydrone electrode." In 1950 he divided sabbatical time between laboratories of Cambridge, England and Cambridge, Massachusetts (MIT) with particular interests in instrumentation.

In addition to researches of purely chemical nature, Stone has taken a keen interest in the instructional technique of both the Chemistry 1A and 2A pro-
grams. In this activity he collaborated with M. S. Dunn and J. D. McCullough, with publication of several editions of laboratory texts described elsewhere.

A few days after the appointment of Stone, announcement was made of the appointment of the second instructor in the program for 1921.

G(orge) Ross Robertson, native of Toronto, Ont., graduated (A.B.) from Pomona College in 1909, and (B.S.) from the University of California, Berkeley in 1911. He then served a term of seven years total in three Riverside, Calif. institutions.

In more youthful days—
(UCLA photo)

First was a single year in the former Girls High School, from which he was promptly transferred at age 24, by the Superintendent of Schools, without Robertson's advance knowledge, to the (Boys) Polytechnic High School. In 1915, on the basis of boyhood experience, he was put in charge of a class in the school print shop, temporarily shy an instructor. He was also elected secretary of the Parent-Teacher Association for the Riverside high schools. This combination of side jobs gave an
unprecedented opportunity to get out propaganda for establishment of a new junior college in 1916. Robertson then got what he thought he wanted, namely, the chemistry job at the new municipal institution, now known as Riverside College.

But the new experiences of 1916-18 revealed to Robertson how profound was his ignorance of advanced college chemistry. To remedy the situation, he completed a 3-year period of study at the University of Chicago, receiving the Ph.D. in 1921 as pupil of Julius Stieglitz; thesis topic: Arsenical Derivatives of Phenylacetic Acid. Robertson also served, 1919-21, as research assistant ("Junior Chemist") for the U. S. Public Health Service. Research interests in later years were directed to a variety of problems, including aminoacid synthesis, reduction of nitro compounds, development of glass-electrode technique, and a number of projects in apparatus design. The list of publications, however, was mostly in the field of semipopular (not "popular") science, numbering over 170 published nationally, mostly for Science Service, Industrial and Engineering Chemistry and Journal of Chemical Education.

Stone was placed in charge of the new Chemistry 2A-2B program, and immediately had his hands full with an initial enrollment of 155. Robertson followed by
inaugurating Chemistry 10. These courses all operated
in the main laboratory on the first floor of the war-
surplus shack then known as California Hall.

In more recent years the Chemistry Department has
demurred at continuance of Chemistry 10, particularly
after the establishment of a third organic course se-
quence, Chemistry 112A-112B for chemistry majors.
During the Bevier regime in home economics, however, no
disparagement was noted.

Now that Chemistry 10 was in operation, the oppor-
tunity came, with the transfer of Dr. Max S. Dunn to
the Los Angeles staff, of completing the Bevier program
in chemistry. The final course, in biochemistry, at
first known as Chemistry 107, later expanded to Chemistry
107A-B, was offered. This course, and its successors in
curricular pattern, have long since become a part of the
Letters and Science program, and are no longer required
of home economics students in the College of Applied
Arts.
CHAPTER 5

THE OFFICE TYPEWRITER PROBLEM

A typewriter was very difficult to obtain in the earlier years. Even as late as 1918, the only opportunity for typing a requisition in the Science Department was in Business Manager White's office, where Dr. Loye Miller, head of the department, was able to use a machine, but without aid of a typist.

During the earlier months of Professor Morgan's term of office as Chairman of the Chemistry Department, Southern Branch, the chief began to think he should have a machine in the department office. Now this idea was in sharp conflict with policy of Berkeley authority, which had established a Central Stenographic Bureau in the south and felt obliged to nurse this new administrative baby. Advent of a typewriter in an outside department would be a serious threat to the economy program which was an essential part of the Bureau activity. Still worse, the installation of a typewriter in "California Hall" would be tantamount to a first step in a campaign to get a departmental secretary. Such extravagance would never do.
But Dr. Morgan, despite a thrifty, economical habit of mind, disagreed. As a first move, he had the temerity to bring his own ancient Remington—a full-size office model, not a portable—into the office, and proceeded to tap out Chemistry 1A, 1B, 8A and 8B hour-examination questions. Now it was evident that the old Remington had seen better days. At last, on May 25th, 1922, the chief boiled over. Addressing a letter to the Director of the Southern Branch (who really couldn't do anything about the problem) he had the nerve to request a brand-new Royal typewriter, which at current prices would have cost the University nearly $80. Morgan, being a thrifty chairman, had the "Equipment and Expense" funds to back up his request. Triplicate requisition was enclosed, according to Purchasing regulation.

In the May 25 covering letter Morgan called attention to his three fast-growing sons, who needed education in the use of a typewriter. The Remington, he averred, should go home before it was entirely worn out. Furthermore, the Chairman referred to "long lists of chemicals," with terrible names that presumably would befuddle a Central Bureau stenographer. Still further, the necessity of making four to six copies of each Chemistry 1A hour examination was stressed, with pessimistic comments on the long time that would be required.
to prepare these in longhand. Special point was made of the fact that all this was NOT intended as an entering wedge for a department secretary. The argument was then capped with the official requisition. The final note on this chapter of the typewriter campaign is the following: As of November, 1958, the triplicate requisition, unprocessed, still lies in the administrative records of the old Southern Branch. Evidently it got nowhere immediately.

Chapter 2 of the typewriter campaign brings in Professor Hosmer W. Stone, who in the fall of 1938, after six years of typewriter frustration, happened to need a machine. He then asked the boss if he might borrow the venerable Remington. Morgan, with little thought about the matter, casually granted permission and promptly forgot the incident. By this time he had probably resigned himself to the Berkeley postulate that all typewriting is done by Bureau girls. Stone took the typewriter home.

Blest with good eyesight and an observant trend of mind, Stone noticed that an official University of California inventory number had been stamped on the chief's old Remington. Now this was a colossal blunder on the part of the University inventory clerk, who had evidently snooped around California Hall in the absence of
Professor Morgan and taken unwarranted liberties. The clerk should have known that the presence of an officially-numbered machine in the chemistry building would be a threat to the integrity of the Central Stenographic Bureau as well as the Berkeley administration. But Stone, after three or four scratches of the head, either didn't care a hoot about the matter, or perhaps cleverly decided to sit tight and go on typewriting.

Chapter 3 of this tale brings in a Royal typewriter deliveryman, who in the early spring of 1929 suddenly arrived and surrendered to Dr. Morgan one brand-new office machine. Morgan gulped briefly, but made no protest. The chief recalled that he had seen no trace of his six-year-old requisition, nor had his "Equipment and Expense" balance been billed for the new blessing. Why comment on the situation, anyway? What Berkeley doesn't know cannot hurt them! The Royal beauty promptly went into service.

Shortly a bright idea occurred to Morgan. He also had noticed that his old typewriter had been inventoried as a Chemistry Department item. A new factor had appeared. The famous fire of January 3, 1929 had intervened, and had ruined all University office property in California Hall. The chief also recalled that this property was officially replaced by emergency appropri-
atation in the January session of the state Legislature. The new Royal of course was the replacement for the erroneously-stamped Remington!

A few more days passed, and Stone decided to return Morgan’s typewriter – "Where shall I deliver it, to your office or your home?"

"What typewriter?" shot back the chief.

"Your Remington" was the obvious reply.

Morgan was aghast. "Don’t ever let me see that typewriter again. It just doesn’t exist!"

So Dr. Stone, encumbered by a typewriter which theoretically had been destroyed by fire, bethought him of an idea. He hastily hauled the old machine down to Westwood Village, where he succeeded in coaxing a dealer to make a tidy allowance on the purchase price of a new portable, which would carry no suspicious evidence and would work much better. This allowance was especially good in view of the recent mechanical operation which Stone had performed on the historic mechanism. It seems that the letter A on the old clunk had gone bad. In view of the rather essential function performed exclusively by the A type bar, the new owner, with aid of tin snips and a piece of tomato can had restored the typewriter to useful service, better than ever.

The final chapter of the Typewriter saga followed
shortly. The present writer, jealous of the good fortune of his colleague Stone, decided he wanted a new, man-sized typewriter. To be sure, he had not lost such a machine, either theoretically or practically, in the great fire. He had, however, lost everything else in his office—slide rule, books, journals, etc. It would not have mattered if he had lost a machine. The destruction of typewriters, slide rules, etc. after all was an act of God and not to be challenged. No reimbursement could be allowed.

At this point the Purchasing Agent broke down, and was filled with compassion. With the connivance of the L. C. Smith—Corona typewriter agency, he succeeded in allowing to the present writer a university discount on a fine new L. C. Smith, complete with (+) and (−) characters to figure profit and loss on the deal. Nobody bothered Berkeley authority on this transaction. The present writer then proceeded to wear out the Smith machine—during numerous succeeding years—mostly on University business, including the present chronicle.
CHAPTER 6

SCHOLARSHIP STANDARDS AT THE SOUTHERN BRANCH

The following chemistry courses were offered in the College of Letters and Science during the nineteen twenties:

Chem. 1A-1B (sometimes called C1A-B-C and L1A-B) - General chemistry 1919-30

2A-2B Shorter course in general chem. 1921-30

5 Short course in analytical chem. 1922-30

6A-6B Longer " " " " for majors in chemistry 1923-30

8 Organic theory, elementary 1920-21

8A-8B Organic theory 1921-30

9 Methods of organic chemistry, including laboratory 1922-30

10 Organic chemistry for students of home economics 1922-30

101 Second course in organic synthesis 1929-30

107 Biochemistry 1923-25

107A-B Biochemistry 1925-30

110 Theory, physical chemistry 1923-30

110B " " " 1923-30

111 Physical chemistry, laboratory 1923-30

120 (later numbered 121) Advanced inorganic chemistry 1923-30

199 Problems in chemistry 1927-30

- - - - -

During the earliest years of the Southern Branch the faculty was keenly sensitive to its obligation to
maintain strict scholastic standards, and this feeling was especially strong in the Chemistry Department. Although nobody would say so out loud, the frank truth was that the Los Angeles teaching staff were anxious that no intellectual weakling, inadequately trained, should be sent from the sophomore class to become an academic burden to the illustrious department at Berkeley. It was of course a well-advertised plan that the youth who had finished the elementary freshman and sophomore courses in general, analytical and organic chemistry at Los Angeles should transfer to the upper division at Berkeley and proceed to the B.S. in chemistry.

As a diversion from this established plan, a certain student with more vision than orthodox judgment, proceeded to campaign in the public prints for an upper division at Los Angeles. This brought down the wrath of the President of the University, who on Dec. 20, 1922 wrote a strong letter to Dr. E. C. Moore condemning the proposal, and virtually ordering the Director to abate such nuisance forthwith. Subsequent records do not seem to indicate that Director Moore did anything about the matter.

An outsider, unfamiliar with the special situation in chemistry at the University of California, might not appreciate the sensitiveness of the Los Angeles chem-

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istry staff about class grading standards. One should realize that the Berkeley department had, only a short time previously, undergone a profound scholastic reorganization. The comparatively new "College of Chemistry" under Gilbert Newton Lewis was setting new standards in fundamental chemistry, both graduate and undergraduate. To be perfectly frank, it had become an academic aristocracy, with such famous leaders as Lewis, Bray and Hildebrand, backed up by an outstanding group of younger faculty members, teaching a new kind of college chemistry from freshman to Ph. D. level.

To the Berkeley chemistry regime, the immature Southern Branch was something to be regarded with misgivings. To be sure, the misgivings also applied to many other institutions of higher education in the far West. Although there may be persons who regarded the Berkeley department as a bit snobbish, one must in due honesty concede that Lewis and his vigorous fellow-critics were the cause of distinct upgrading in chemical education, country-wide. It was not long before numerous Eastern institutions adopted the fashion of establishing a Berkeley Ph.D. on each of their respective staffs.

With these new rigorous academic standards Morgan was in whole-hearted agreement. It soon became known
that chemistry in the Southern Branch was no snap curriculum. Not only Hildebrand, Bray, Latimer and Rosenstein in the North, who had published new scholarly text and manual material for Chemistry 1A, but also the southern staff members were rapidly taking freshman chemistry out of the "glorified high-school chemistry" zone in which it had dawdled for many years. The contributions of Stone, Dunn and McCullough to this program are cited elsewhere in notes on departmental publications.

Chemistry was not the only department on Vermont Avenue suggesting that happy-go-lucky college students get to work. The ideas promptly crystallized, in the early twenties, in the establishment of a rather severe code of grading standards. This schedule was adopted by the Southern Branch faculty, after considerable debate, and very much under the leadership of Morgan. Even to this day the present writer is not sure that all of the faculty thoroughly understood the regulations set forth at the time. Certainly many students did not.

First an attempt was made to define the A, B, C and D performances on the basis of the fraction of a normal student body which might be considered as belonging in each bracket. The following schedule was then finally adopted:-
Distribution of Grades to Passing Students

<table>
<thead>
<tr>
<th>Lower Division</th>
<th>Upper Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5%</td>
</tr>
<tr>
<td>B</td>
<td>25</td>
</tr>
<tr>
<td>C</td>
<td>50 to 60</td>
</tr>
<tr>
<td>D</td>
<td>10 to 20</td>
</tr>
</tbody>
</table>

The following interpretation of the above schedule is approximately that held by the Morgan committee, and followed closely by Morgan and chemistry staff during many subsequent years:

First one deletes from the record of any given class names of all persons who dropped out or failed the course. Of those remaining, the instructor divides the group according to schedule, but not rigorously or exactly in any given year — particularly in the case of a small class. The idea is perhaps best illustrated by the stock answer given to the stock question — for example:

**Student** — "What do I have to do to get a "B" grade in Chemistry 1A?"

**Instructor** — "If, in my opinion, your record at the end of the semester shows that you are in the best 30% of all the passing Chemistry 1A students I have ever seen, but not in the top 5%, you will get a "B" grade."

Within a very few years it was evident that the grade-point average of a Southern Branch chemistry major,
to say nothing of persons in other fields, would rise markedly as soon as he transferred to another university, regardless of the scholastic prestige of such outside institution. This applied to U. C. Berkeley as well as other universities. Exceptions were rare. There was no question as to the competence of Southern Branch students transferring to northern courses such as Chemistry 110, 111 and 120 in the upper division. Some uncritical persons found it difficult to reason logically when they found that a "B" student from Los Angeles often landed in the "A" column after arrival at Berkeley.

Although no special public announcement seems to have been made on the subject, the drastic 5-25-50-20 etc. schedule has fallen into innocuous desuetude. The new and greater UCLA, including the Chemistry Department, has become much more generous in awards of high grades. Actually, in the opinion of the present writer, it is probably best that the grade distribution for the lower division has now become roughly comparable with the upper-division scheme of Morgan and fellow committeemen. Such opinion is based on the fact that reputable state universities of high standing, country-wide, are more in agreement with the more lenient schedules of percentages. At the same time, the present writer deplores the fact that the administration no longer explains, or in a broad
manner regulates, the distribution, not as defined in the twenties, but on the newer more lenient schedule.

The rigorous standards maintained by Morgan were illustrated by an incident of a faculty meeting about 1925. Two of the foremost members of the academic-administrative staff had just reminded the faculty of the very small library budget available to the Southern Branch. The point of their discussion was that the institution could not afford costly research journals and back sets of the same. The fund was sufficient only to provide additional texts of the day which were needed to supplement the authorized text of a course.

To this proposal Morgan arose and blew a vigorous blast of academic protest. Let the ephemeral texts of the day go by; we want the research archives. As a result of this protest, at least Chemistry made a splendid showing, even though one still cannot claim that the Department has a complete set of texts and monographs.

If one returns to student history, it is interesting to recall some of the personnel who achieved the rare honor of "A" in lower-division chemistry. McGrane, Gunther and C. W. DuBois were outstanding as of 1920-22. Perhaps the most striking display of scholarship was that made by Robert H. Dalton in 1921-22. Young Dalton
arrived at the old barracks laboratory, armed with the
recommendation of his high-school teacher that he be
permitted to take the year course of freshman chemistry,
1A–1B, and the year of sophomore organic chemistry, 8
and 9, simultaneously. In some manner not described in
the records, this slender youth got Morgan's approval.
There was no mistake; final reckoning, completed in
June 1922, showed that Dalton had taken the top "A" in
all four courses. This student later became special re-
search assistant to Arthur A. Noyes, and later attained
distinction as an industrial chemist in the glass in-
dustry.

Other top scholars of the day included Carrol B.
Beeson (later S.C. professor), P. Heiser, Robert Mithoff,
Glyve Allen, Mabel Campbell, V. L. Martins, Frank Aug-
ustus, Garson Bender, Wayne Johnson, Josephus Reynolds,
J. D. Elder, and last but not least, Roscoe A. Weaver,
later to be chief engineer of the University of Califor-
nia, associated with "Architects and Engineers." In
later years appeared Ray H. Pinker, later chief of the
laboratory for the police department of Los Angeles.
With the advent of the nineteen thirties, and the devel-
opment of a more substantial upper division in chemistry,
the attitude of the department toward high scholarship
took a new trend, culminating in the development of a
real graduate school, as discussed later.
CHAPTER 7

BIOCHEMISTRY AND PHYSICAL CHEMISTRY ADDED

In 1922 approval was recorded for the transfer of Dr. M. S. Dunn from the Department of Biochemistry at Berkeley to the Los Angeles chemistry department.

Max S(haw) Dunn, native of Iowa, took the degree of A.B. in chemistry at Simpson College in 1916. After engaging in medical and chemical work at the Rockefeller Institute for Medical Research he was commissioned as lieutenant in the Sanitary Corps, USA. This was followed by the M.S. and Ph.D. (1921) in biochemistry at the University of Illinois, with thesis directed by H. B. Lewis, "Amino Acid Studies on Casein and Deaminized Casein." In 1951 Dunn's alma mater, Simpson College, awarded him an honorary D. Sc.
During his earlier years at Los Angeles, Dunn was actively interested in synthesis of amino acids, a topic little developed at the time. In his studies of these biochemistrys he had been embarrassed by the preposterous market prices, or even total absence of supply, of these compounds. For example, the Eastman catalog price of glycine, simplest of amino acids, in 1927 was about $45 per pound. By contrast, Eastman's list No. 41(1958) quotes a purified grade of this amino acid at $3.75 per pound. When one recalls what has happened to the dollar since 1927, it is easy to see that something has happened in the biochemical market during intervening years.

In the face of the excessive prices of thirty years ago, Dunn took a cue from "Organic Chemical Manufactures" of Roger Adams and Carl S. Marvel in Illinois, and established "Amino Acid Manufactures" in Los Angeles. This was a nonprofit, nominally commercial enterprise for provision of supplies for research, both for Dunn's own work and for numerous customers of the time who were glad to get such items as alanine, glutamic acid and various other products at reasonable prices. As in Illinois, many students got excellent practice in large-scale laboratory preparation. Just as Illinois has long since dropped the commercial operation, Dunn no
longer operates the "Manufactures," there being ample 
supplies in the outside market. In the meantime, Dunn's 
interest has long since shifted to other areas, includ-
ing chemical microbiology, the principles and applica-
tions of chromatography, and nutritional and biochemical 
investigations of organisms and physiological materials.

Perhaps the most outstanding part of Dunn's recent 
researches has been in the studies, starting in 1941, of 
the use of lactic acid bacteria in relation to require-
ments of nutrition. Specifically, Dunn was one of the 
earliest pioneers in the estimation of amino acids by 
microbiological technique. His extensive list of data 
and methods for the whole gamut of important amino acids 
is in world-wide use.
On June 19, 1922 recommendation was made to Director E. C. Moore for appointment of Dr. R. W. Millar as instructor in chemistry.

Russell W(ard) Millar, native of Illinois, received the B.S. (1916) and M.S. (1920) degrees at the University of Illinois. During World War I he attained the rank of major in the Chemical Warfare Service. Millar then obtained the Ph.D. with thesis on the specific heats of polyatomic gases at low temperatures, under direction of Gilbert N. Lewis at the University of California, Berkeley. He remained only three years at the Southern Branch, resigning in 1925 to spend the next three years as physical chemist for the Bureau of Mines, Berkeley laboratory.

Coming from the rigorous academic climate in the Berkeley department, Millar was somewhat impatient over the primitive quarters, equipment and program in the Los Angeles department. Actually the present writer was
very glad to have a severe critic, even one of "debunking" temperament, around the place to keep him and colleagues from being either too complacent or too naive, as the case might be.

Following his term with the Bureau of Mines, Millar entered what was to be his real life work, 1928-1953, with the Shell Development Company at Emeryville. After many years as Head of the Physical Chemistry Department in that excellent laboratory, he was made Head of the Chemical Engineering Department in 1952. During the long period of service at Emeryville Millar took much interest in personnel and employment relations, and maintained numerous contacts with universities and colleges, nation-wide. He died in Berkeley Feb. 24, 1953.

As the calendar year 1922 advanced, the prestige of Morgan's A-grade junior helpers climbed higher. George Scofield, hitherto worth only $35, was raised to $50 a month. The new entries of Beeson and Mithoff appeared in the list for as much as $100 per semester. For the next academic year, 1922-23, things were still better. The trusted and faithful McGrane went to $1,500 a year, and Scofield was upped to $800. In due fairness to McGrane's professional reputation, this memorandum is included to help in explaining why Norman took six years
to "get through college." To add to the daily happiness of the staff, a full-time storekeeper, in the person of Mr. Paul Phillips, accounted for another $1,500. Verily the department was looking up.

By this time it became necessary to remodel the "California Hall" barracks. Part of the structure, hitherto used as a classroom, was added to the general laboratory area, raising student capacity to 1,300, locker count. A new faculty salary schedule was announced, as follows:

<table>
<thead>
<tr>
<th>Number of Persons</th>
<th>Number of Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professors 3</td>
<td>3</td>
</tr>
<tr>
<td>Assoc. prof. 57</td>
<td>1,800 to 3,900</td>
</tr>
<tr>
<td>Asst. prof. 36</td>
<td>1,200 to 3,000</td>
</tr>
<tr>
<td>Instructors 27</td>
<td>1,800 to 2,400</td>
</tr>
</tbody>
</table>

Inconsistencies in the above table merely indicate that a really stable fixed code had not yet been developed for the institution with holdover instructional staff.

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On June 5, 1923, Director Moore notified Dr. James Blaine Ramsey of his appointment as instructor in chemistry, thus providing a second Ph.D. of the now famous Berkeley laboratory for the Southern Branch chemistry staff. Ramsey took up duties in September.

A native of Kansas, Ramsey took his A.B. degree at the University of Kansas in 1916. There followed
short periods of service as high-school teacher and chemist for the U.S. Bureau of Mines. In 1923 Ramsey attained the Ph.D. degree at the University of California, Berkeley, under the guidance of William C. Bray, renowned inorganic chemist, with a thesis dealing with kinetic studies of vanadium compounds.

A likeness of the World War II period

Ramsey was greatly impressed by the sound scholarship of Bray. The mere detail of a new Ph.D. degree and a transfer 400 miles southward meant nothing to Ramsey in professional fellowship with his predoctoral director. It would be difficult to find a more striking example of friendship among scholars than in the extensive technical correspondence which ensued and continued through the lifetime of Professor Bray. This fellowship undoubtedly had its influence on the rigorous intellectual fare which the younger man proceeded to dish out to Chemistry 110 and 111, physical chemistry, during the following years in Los Angeles. Many are the students who cursed
Ramsey for the tough jobs he assigned. They looked forward to the 110-111 program as the magnum opus of their undergraduate career. It was not just another course, but rather an academic crisis in life. As these students so often planned, the senior year, sacred to Chemistry 110-111, was not to be embarrassed by any other heavy job; instead, fill up the rest of the program with "cinch" courses if necessary! But all this did not leave bad memories. There is probably no member of the UCLA chemistry staff who could have shown as many letters of appreciation from old graduates who remembered the personal attention they got from their hard taskmaster, and who felt that they really got their money's worth.

As a culmination of a third of a century at the one job, Ramsey was chosen as department chairman for the final three years of his period of active service, 1956-1959. At last, when the time came to hand over the baton to another, on July 1, 1959, the University had to appoint two men to do the chairman's job!

A recent summary of Ramsey's research interests includes such topics as induced reactions, in particular those involving free oxygen, thermodynamic properties of salts in nonaqueous solvents and the influence of ion structure and solvent on these properties.
Now if one may be excused for a questionable play on words, the inauguration of "physical" chemistry seems to have set off a short era of physical effort among chemists. During this era, in mid-twenties, the Southern Branch chemical staff served as principal pillar of strength in the Faculty Tennis Team, which battled valiantly with the corresponding athletes of the California Institute of Technology. Under the leadership of one Wm. C. Ackerman, a slender youth who served as tennis instructor on the Vermont Avenue campus, such stars as Hiram W. Edwards, physics, Max Dunn and Hosmer Stone were the principal performers. A bout between Dunn and Ernest Swift (now Director of the Gates-Crelin Laboratories at Pasadena) was one of the principal shows of a tournament, held alternately in Pasadena and Los Angeles.

Even Robert A. Millikan was persuaded on at least one occasion to play, with W. C. Morgan as opponent. Apparently the worst player on the Tech team was the famous professor Howard J. Lucas, who was normally seeded to play against the present writer, and alas, usually won his match. Intermediate talent included James B. Ramsey. But Morgan's efforts came to a sad end. In practice with Ramsey, one morning he ingloriously tumbled and broke his arm. Never again did he tackle even the present writer.
CHAPTER 8

A NEW NAME - UNIVERSITY OF CALIFORNIA AT LOS ANGELES

During the period 1923 to 1927, with three new faculty members on duty, the Chemistry Department expanded its offerings, particularly in physical chemistry and biochemistry. Dr. Morgan really began to worry over the fire hazards of California Hall, and well he might. November 10, 1923 brought a letter from Morgan to the Director, suggesting $1,000 to $1,200 for a physical chemistry laboratory. One wonders what the present department building committee would think of such a rash outlay!

By 1925 a new faculty salary schedule was established as follows:

<table>
<thead>
<tr>
<th>Rank</th>
<th>Salary Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>$4,000 to $8,000</td>
</tr>
<tr>
<td>Associate</td>
<td>3,300 to 3,900</td>
</tr>
<tr>
<td>Assistant</td>
<td>2,700 to 3,000</td>
</tr>
<tr>
<td>Instructor</td>
<td>1,800 to 2,600</td>
</tr>
</tbody>
</table>

This schedule was due to remain for many years without alteration - not counting the short mid-depression period when slight temporary discounts were necessary.

The "Southern Branch" had now become thoroughly
tired of its name, and the Regents finally decided to call the place "UNIVERSITY OF CALIFORNIA AT LOS ANGELES." The central administration insisted on the "AT," which hung on until 1958. To make sure that the AT would not get lost, printers of University stationery were directed never to print the name of the Los Angeles division in more than one line. This admonition was soon forgotten, however, with appointment of a new President.

Of great interest to the Chemistry Department was the campaign of the mid-twenties to move UCLA to a new campus. All thought of a new laboratory on Vermont Avenue went into the discard. When final choice was made of the Westwood Hills site, Dr. Baldwin M. Woods, prominent engineer and administrative leader in the Berkeley faculty, was appointed chief executive of the program of campus development for UCLA.

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By this time an interesting feature of scholastic activity had made some progress, namely, the Faculty Research Lectureship. This began in 1925. Each year, at the time of the Charter Day celebration, an outstanding researcher was selected for presentation of his specialty. The series opened with a lecture by Loye Holmes Miller, already cited in this record as the first administrative head in chemistry (and other sciences as
well) before the appointment of Morgan. "The Fossil Birds of California" was the first topic, March 1925.

Three chemists have now participated in the Faculty Lecture series. First, in 1947, was the address by W. G. Young on "Organic Reaction Mechanisms with Allylic Compounds." A brief summary of the activity leading to this address is given here in another connection. A much more detailed treatment of this topic was given, by invitation, in Young's contribution to the ceremominal volume in honor of President Sproul, published at the time of the latter's retirement.

In the Research Lecture Young emphasized the applications of the concept of resonance, and thus of optional molecular design, in doubly-bonded aliphatic compounds. An old-fashioned organic chemist, accustomed to the supposed sanctity of fixed architecture in organic molecules, must have been somewhat dismayed to find how mobile these entities really are.

In 1950 the lecture was given by M. S. Dunn on the topic "The Protein Problem." Application of microbiological techniques was discussed, with correlation of analytical, physical and organic chemistry.

The 1955 lecture was given by Saul Winstein under the semipopular title - "Outwitting the Reacting Molecule." Control of reaction mechanism, when such is possible, by
choice of reagents, solvents and various conditions was discussed.

During 1925 an attempt was made by University authorities to formulate an official teaching load for faculty members. In general, it was held that the classroom load should range from 12 hours (instructor) down to about 8 or 9 hours for (full) professorial rank. These standards were probably reasonable for an institution forbidding graduate study, but have little or no significance in a complete university giving advanced professional training. The subject is now of renewed interest in view of the current hubbub about substitution of television for "live" professional college lectures.

In the UCLA chemistry department, to say nothing of other major centers of chemical education, the real class-A education is not that of the lecture hall, but rather in the personal direction of graduate study. In this field, which has become the top function, television so far has little or no significance. Accordingly, the problem of 12 or 8 hours classroom load is not worth arguing. During the twenties, however, teaching schedules of 14 to 27 hours per week prevailed in the department. These loads undoubtedly put a brake on research development that otherwise might have led to earlier initiation of graduate study.
In view of the forthcoming sabbatical leave of W. R. Crowell (first in the department), Kirk A. Thomas of the Pure Oil Company took over in quantitative analysis, spring semester of 1928. Crowell spent the semester in research with A. A. Noyes. Thomas, who naturally had already acquired the nickname of Tom KAT, had been trained under Reyerson at the University of Minnesota. H. Darwin Kirschman and Richard D. Pomeroy of the California Institute were appointed assistants in elementary chemistry, and T. W. Woodbridge, former Cornell student, as department storekeeper.

To complete the highly miscellaneous information of this era, the University archives report official Regents' approval of an appropriation of $100 to pay the expenses of Max Dunn in catching fish; but this was in quest of spermatozoa, not sport or dinner, and at San Pedro. O yes; one more strictly miscellaneous item: Professor Morgan, in an official communication, reported to the Director that the doors in California Hall were now \( \frac{1}{2} \) to 1 inch narrower on the swing edge than at the hinge edge." The chief added that it might be well to jack up the whole building and slip in a few 4" x 6" timbers. But this was never done. The fire of 1929 and the new building program solved Morgan's problem in mensuration.
CHAPTER 9

NEW BUILDING PLANS FOR THE WESTERN CAMPUS

Early in the building program Director Moore had conceived the idea that a physics building and a chemistry building should be built. Other natural sciences would be housed temporarily in these two buildings. Eventually this plan was adopted, but not without intermediate turmoil. The question was complicated by the drastic ruling of the extremely economical Governor Richardson, who declared that the proposal of a bond issue of $5,000,000 to build UCLA was extravagant, and cut the figure to $3,000,000 before submission to voters.

Independent of Moore's plan, the Regents had voted, early in 1927, to build two buildings for the natural sciences. Shortly the proposal was considered by Dr. Baldwin Woods, campus planner, to let one of these buildings be a combined physics-chemistry structure. The Chemistry Department made no special comment on the proposal, but the physics group, under the chairmanship of Samuel J. Barnett, reacted violently. In their vigorous letter of June 3, 1927 the physicists exclaimed over the prospective fume damage to physics apparatus. When one considers the primitive ideas on ventilation held by
Aerial view of Rancho San José de Buenos Ayres, site of UCLA campus, Oct. 21, 1927, shortly after the University started development of facilities. Approximate location of the (second) new Chemistry Building, to be built in 1950-52, is marked by X below center of the view. (Spence Air Photo)

Approximately the same area, 1951

(Title Insurance and Trust Co.)
chemists, architects and engineers thirty years ago, one is inclined to agree with the Barnett protest!

Dr. Barnett pointed out that the piped services, which were supposed to be handled most efficiently in a joint physics-chemistry building, could be handled well enough between buildings several hundred feet apart. The demonstration-lecture room, he continued, must be under continuous use by Physics, both during, before and after lectures. It would never do to have Chemistry share such a hall. Research shops should be separate; if only one could be built at first, let that be in the Physics Department. Finally, if Physics must live with somebody else, let that be biology. The letter was signed by the physics staff with but one dissenting member.

Physics now enlisted the support both of Director Moore, who readily cooperated, and even of Dr. Robert A. Millikan, who wrote the sardonic comment that "only small institutions would combine physics and chemistry." Confronted with all of this advice, Dr. Woods and the central university administration yielded. It was agreed to build a Physics-Biology building, and a Chemistry-Geology building. Thanks to the Governor’s economies, it was possible to build only about 70% of the minimum acceptable "Physics" building, and about 60% of the min-
imum "Chemistry."

By this time Morgan had decided, all by himself, what sort of chemistry building he wished, and had prepared blue prints. It was to be a T-shaped structure, including four 50-student freshman laboratories, staff offices without faculty laboratories, and a lecture hall for 496 students. These blue prints fortunately still rest in the University archives, nothing having been done about them. The University supervising architect, George Kelham, was also strong-minded. Perhaps with the cooperation of Dr. Woods, an entirely different plan was put into effect. Physics was also "pushed around," but mainly because that ambitious department had asked for too much, namely 107,000 square feet net floor area, an allotment not attainable under the Richardson economy plan. Chemistry had requested 67,000 sq. ft.

The "executive-architect" job was given to Mr. Kelham, along with the University Library. The slab-and-pillar design was adopted, with nonsupporting brick walls to be filled in. In this way a structure highly resistant to both fire and earthquake was assured. In the original 1928-29 job the north 60% was built, leaving the unsightly 40% gap in front where it would be most displeasing, and thus most likely to cause the Regents to finish the job at the earliest possible date. The
Western Brick Company manufactured the entire quantity of special brick needed for the ultimate complete structure. Accordingly, the building (at present called Haines Hall) has a uniform external appearance.

Although 1928 might seem to be recent in world history, it was much too early to ensure either proper safety provisions or proper ventilation, particularly the latter. Very few fume hoods were provided - none at all for freshman chemistry, organic chemistry or biochemistry. A fume porch was built on the north end, which most of the time might be called the leeward section of the laboratory. Bad smells were supposed to be generated only on this porch. In common with custom in the best university laboratories nation-wide, an elaborate system of direct-current electric wiring was installed, without any clear idea who might need such complicated service. It must be conceded, however, that all of this electric elaboration was before the invention of the portable laboratory auto-transformer and efficient portable laboratory electronic rectifier. Laboratory furniture was done in Philippine mahogany by local talent.

As far as the acoustic art was concerned, the Chemistry Building would have been a complete blank except for Morgan, who succeeded in coaxing his old architect friend, as a personal favor, to give the walls of class-
First Chemistry Building on the western campus, as it looked after the last 40% (left section) was completed in 1935.

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rooms a treatment with a rough, primitive type of acoustic plaster. Fairly good results were thus achieved. Unfortunately, Morgan's original idea of individual freshman laboratories had disappeared, and in their place was built a huge duplex laboratory holding nearly 200 students, all within earshot of each other. Finally, as the year 1928 came to an end, the chemistry staff looked restlessly toward their new home.
CHAPTER 10

THE GREAT FIRE OF 1929

At 2:42 a.m. on Thursday, January 3, 1929, four days before the opening meeting of the biennial session of the Legislature of California, Messrs. Eugene Campbell, '29 and Berry Campbell '32, students at UCLA, were sleeping at their domicile on Willowbrook Avenue, southeast Hollywood region. They were rudely awakened at that moment by a mild explosion in the Chemistry Building across the street. Probably a five-gallon can, not nearly full of ether or acetone, had just blown up. By the time the Campbells were able to summon the fire department, it was too late. Reports of the day indicate that four hours were required to get the situation under control. California Hall, appraised at $30,000, and most of the chemical apparatus, were ruined.

Fire department and police staff had considerable trouble dissuading students from risking their lives in quest of supposedly valuable books in lockers. Storekeeper Woodbridge arrived at the scene just too late to get the department apparatus inventory out of the second-story main office. Police would not listen to his entreaties. Actually, it was fortunate that he did not
salvage the inventory card file, for simple reasons:

State buildings are not insured in the conventional manner common to private property. When a state building is destroyed, the Legislature merely replaces what was lost; this is cheaper in the long run than paying insurance premiums. Now be it known that California Hall had a lot of obsolete equipment that cost a tidy sum originally, but which need not be replaced in the literal sense. Shortly came the day when the financial authorities of the Legislature came down—through channels—on Professor Morgan for a record of what was lost, and thus what must be repurchased. Morgan now had no record,
and could only give the administration, and thus the Legislature, some vague, rounded-off figures, so many thousand dollars for each category, to cover losses. The department chairman thus officially forgot completely all the antiquated clay burners (of course we had to have some kinds of burners), Kavalier glassware, etc. and made a perfectly honest guess on the amount of Pyrex glassware needed to replace the equipment which now was rubble. The replacement of fragile Czechoslovakian (Kavalier) beakers and flasks with modern American Pyrex ware was particularly happy.

The present writer received the commission, at the next noonday period, of listing all of the organic chemicals needed for the rest of the year. The list was forthcoming shortly before noon on the next day, and was shot through the Braun Corporation order room in another day. The Braun staff, given carte blanche to suspend the usual delays of purchase on bids, put almost its entire sales staff, under direction of J. A. Hartley, later Corporation president, on the task of replacing the losses. Even Mr. Hartley himself came out, viewed the ashes, charcoal and bent pipes, wept sorrowfully with the staff and got busy replacing everything.

In the meantime Director Moore had telegraphed the news to President Campbell in Berkeley, who set wheels
in motion. Dr. Baldwin Woods and Regent Fleischhacker immediately approved the proposal to rush the new Chemistry Building in Westwood Hills to completion and turn it over to the homeless Los Angeles chemistry department. It was pointed out, to be sure, that no heating facilities would be ready during the current winter season. The prospects for getting in before advent of warm weather were not very good, however!

In the meantime the local staff on Willowbrook Avenue scratched their heads over their predicament. First as to cause: Campus wits of course immediately blamed Dr. Morgan, who according to this view was exceptionally clever to pull off a fire (a) when his new building was nearly done, and (b) four days before the Legislature could meet, with full treasury, and pass the emergency bill giving restitution. The fire apparently started just under Dr. Morgan's centrally-located second-story office.

Night watchman C. Hutson offered somewhat conflicting testimony. On the same fateful morning, at 5:15 am, Mr. Hutson found a theatrical stage curtain in Mills- paugh Hall smoldering. The fire was extinguished without serious damage. This led the fire chief to brand both the auditorium and Chemistry jobs as probable arson. But Dr. Morgan managed to wiggle out of all blame.
The California Daily Bruin sagely observed: "The fact that records were destroyed gave a large number of students cause for rejoicing. Others gazed ruefully at the blackened embers, grieving over lost reports and valuable papers." Professor Morgan lost excellent runs of Chemisches Zentralblatt, Chemical Abstracts (Vol. 1 ff.) and other American chemical journals and books. Stone and Robertson lost everything in their offices, but Crowell and Ramsey escaped since their offices were in the small annex building which the fire department saved. The present writer had previously collected, with aid of colleagues, quantities of recent volumes of American Chemical Society journals, donated by chemist friends. These he listed for cost replacement by the Legislature, but their identity was lost in the burnt records. It now seems that the restitution money was then spent by somebody on European journals, which nobody would have donated! The writer then felt better, and decided that his earlier efforts had not been in vain. He then proceeded to beg more American journals from still other generous chemist friends.

Dunn, at the extreme east end of the charred ruin, was not so fortunate. The fire department succeeded in controlling the blaze just as the flames were well started on the job of licking around the bookcases. Practic-
ally all of Dunn's books were thus saved in very bad order, and the owner spent the next thirty years gradually rubbing off the soot, cleaning up and rebinding.

The laboratory ceilings had been crisscrossed with an extensive distilled-water distribution system, all done in seamless block-tin tubing. Great lengths of this tubing half fell, half splattered upon the laboratory floor. The Chemistry Department research machine shop is still (1959) using soft solder from this source. But most of this valuable salvage, worth $1 per pound, got into the hands of the Superintendent of Buildings and Grounds, who was a somewhat more alert Scotchman in picking up high-priced junk.

The present writer, however, claims to have achieved the most spectacular salvage from the fire. Wednesday afternoon, January 2, had been spent by him on a minor research job requiring a Leeds and Northrup chemical potentiometer. Come 5 p.m., and time to quit. It was feared that fumes might damage the potentiometer, and a cover was sought. None at hand. The only substitute was a heavy pine drawer of the type used in the downstairs lockers. The drawer was placed carefully, bottom up, over the potentiometer, with a look to see that no crack space was present to admit fumes.

The following night of course brought the fire. The
fire department thoroughly extinguished the flames just before the all-wood laboratory bench would have crashed below. Studdings and joists had not collapsed. The firemen, following their standard technique, proceeded to open all closed spaces in the charred ruins in search of any lingering flames or coals. And so it was, at 8 a.m., when the staff started to inspect the ruins, that an uncharred, virtually undamaged potentiometer was found peacefully resting on a blackened laboratory bench charred "to the bone." It reminded one of the historic Phoenix bird poised to take wing from the ash-covered scene of mythological fire disaster.

Records of course were generally destroyed—alas, just before impending final examinations were due. An amusing sidelight on this situation was revealed when two sheepish maidens, enrolled in one course, after due private conference decided to reveal the illicit trick they had pulled just before the fire. They had sneaked into a faculty office and copied the entire class grade record for the semester, with the aim of figuring out by some percentile legerdemain whether or not they were going to pass the course.

Examination of the copied record by the instructor gave no suggestion of foul play. The grades for the two shame-faced copy-cats were quite low. Others were recog-
nized as unquestionably valid. In summary, decided the instructor after pulling his chin, one might as well accept the unofficial grade record, and perhaps write off the situation pretty much as an Act of God, as the lawyers would say. Practically everybody passed the course, anyway, including the copy-cats.

As salvage operations proceeded, some of the staff, especially the storekeeper, wished that Messrs. E. and B. Campbell had snoozed a few minutes longer, to ensure complete destruction of the blackened apparatus in the laboratory benches on the first floor. Actually an astonishing task ensued in the half-successful attempt to wash the grime from smudged equipment. At last by March 1929 the new Chemistry Building unit (about 60% of the ultimate structure) was ready, and on Monday, March 18, 1929 Dr. Hosmer W. Stone held the first university class ever to meet on the western campus. This was a section of Chemistry 1A.

A bus service was inaugurated to allow students to study on Vermont Avenue in the morning, and on the western campus in the afternoon. The poor chemistry faculty had to shuttle at their own expense for gasoline etc., and were jealous of the employees of Buildings and Grounds, who for several weeks had duties on both campuses, and who traveled in University cars for shuttle
CHAPTER 11

NEW BUILDING AND NEW STAFF

In the spring of 1929, members of the department noted with acquisitive interest that one William G. Young was about to get a doctor's degree at the California Institute. Unfortunately the offer of a post-doctoral fellowship proved to be the most attractive, and UCLA lost the chance it hoped for. Another year passed, the stock market went to pot, and the deadly blanket of business depression slowly settled over the country. "Tis an ill wind that blows nobody good," said the prophet of yore, and the UCLA offer of 1929 looked better repeated in the summer of 1930. Young accepted an instructorship, to the great satisfaction of parties concerned.

William G(ould) Young, native of Colorado, received his A.B. degree (1924) and M.A. (1925) from Colorado College. In addition to chemistry grades with honors, Young made his varsity letter in basketball and was intercollegiate champion of the Rocky Mountain belt in golf. After short periods as summer session instructor and research assistant he completed the program for the Ph.D. under Howard J. Lucas of the California Institute
William G. Young at work – as the new Chairman of the Department at the outset of World War II.

William G. Young at play – at Lundy Lake, just outside the northeast corner of Yosemite National Park. (Perhaps German Browns; maybe Rainbows.)
in 1929. His thesis dealt with unsaturated aliphatic organic compounds.

Following appointment at UCLA, Young advanced to the professorship, department chairman (1940) divisional dean of physical sciences in the College of Letters and Science, and most recently, vice chancellor in charge of building and campus development. Outside honors include membership in the National Academy of Sciences, chairman of the national (ACS) Committee on Professional Training of Chemists, and national director (western district of the USA) of the American Chemical Society. At last report he could still account for himself in good style at faculty-club golf.

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To compensate in part for the delay in employing Young, Mr. Robert J. Eldridge, instructor in chemistry at Michigan State Teachers College, Kalamazoo, had received a temporary appointment. At the same time the staff had taken notice of two outstanding students, Messrs. C. Ernst Redemann and Alva C. Byrns. Redemann was then due to serve the department as assistant and junior instructor for several years, or until he went to the California Institute for doctoral training and major professional appointments beyond.

Byrns, later to become a leading technical executive
of the Kaiser organization, did such a good job as a mere student in Chemistry 1A that he was appointed laboratory assistant in the next Chem. 1A class while he had not yet personally completed Chemistry 1B!

July 16, 1930 might be taken as a momentous day for UCLA when the brand-new President, Robert Gordon Sproul appointed a committee of nine, including two members from Berkeley, to consider the proposal of graduate study on the Los Angeles campus. Dr. E. C. Moore was ex officio chairman, Professor Charles Grove Haines de facto chairman. Questions for the first meeting included the following items: (1) Need? (2) In what departments? (3) Cost?

Following a summer's intermittent discussion, it was officially decided to authorize Chemistry to offer graduate courses but not to give postgraduate degrees. Nine departments were validated for full graduate work: Biology, English, Geography, History, Mathematics, Physics, Psychology and Political Science. Shortly afterward Economics, Education and Philosophy were added to the approved list. To be sure, this page in our chronicle doesn't look so good, but that topic is left for later discussion in a special chapter entitled "Advanced Study."

By 1931 there entered the department activities two
ROBERT GORDON SPROUL - a likeness of the earlier days of his period of service as President of the University of California.

The Chemistry Department, as well as other academic groups, owes a debt of gratitude to this executive, who started the ball rolling for graduate study at UCLA just fifteen days after he took the president's chair in 1930.
more excellent junior performers – Herbert F. Laumer as a teaching assistant, and George H. Fielding, as "Solution Maker." During the next year Laumer, a German-American with great interest in the home country of his ancestors, went to the University of Berlin and attained the Ph.D. degree; later he was connected with the Bureau of Standards at Washington. To replace Laumer, at the tidy salary of $130 per month, Mr. James D. McCullough was appointed as "associate," or junior instructor.

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As the year 1933 advanced, it was realized that the overloaded Dr. Ramsey needed help. Accordingly, Francis E. Blacet was brought from Stanford University as instructor.

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Francis E(dward) Blacet took his bachelor's degree at Pomona College in 1922, and served as instructor in chemistry at his alma mater for the following
five years. By unusual strokes of fate, Pomona almost simultaneously lost its chemistry department head by death, and the second ranking professor by resignation, leaving Blacet, a young man in his early twenties, with the entire responsibility for department administration as well as instruction. This experience probably did him no harm, in view of the esteem in which he has been held in administrative as well as academic circles ever since.

Following the rigorous Pomona apprenticeship, Blacet went to Stanford University, and took the Ph.D. under direction of Professor Philip A. Leighton on the thesis "Photolysis of Acetaldehyde and Propionaldehyde in the Vapor Phase." He then joined the UCLA staff as instructor during an era when the picking for a collegiate employer was very, very good. The new appointee in due course advanced to Professor, department chairman(1948-1956) and divisional dean of physical sciences(1957-). During this period Blacet won international fame for his combination of research in gas analysis with a number of projects in photochemical decomposition of organic compounds. Originally conceived only as work in pure science, this photochemistry promises to give valuable service in the formidable array of smog research problems now facing southern California in particular. In this
field of public service Blacet serves as consultant for the County of Los Angeles.

A large part of the period of World War II found Blacet in strictly "classified" chemical research for the armed forces. Much of this time was spent in Evanston, Illinois, in co-operation with scholars of Northwestern University and the University of Chicago, with excursions to Central American tropics to test improved materials for use in defensive procedures of gas warfare.

During the spring of 1957 Blacet took sabbatical leave, spending the major part of the term in research at the University of Rochester, in collaboration with Dean W. Albert Noyes, and also in the laboratories of the National Research Council of Canada, in Ottawa.

Although the local chemistry department is loath to employ its own Ph.D.'s, experience has shown that reasonably good luck can be expected in recalling good B.S. graduates after they have gone away and attained the doctor's degree elsewhere. In the case of J. D. McCullough, the department took special pains by trying out the candidate for four years as "associate" before he got his degree. Local authority thus really knew what we were getting.
James D(ouglas) McCullough took the A.B. degree at UCLA in 1932, and served as associate, or junior instructor, until he was awarded the Ph.D. at the California Institute in 1936. His thesis dealt with structural and equilibrium studies of selenium and its compounds, under direction of A. O. Beckman, now the famous instrument manufacturer. For many subsequent years McCullough has continued studies in X-ray spectrography.

Along with X-ray researches McCullough has contributed extensively to the development of the local program in elementary chemistry, in collaboration with Stone, Dunn, Blacet and others. In more recent years most conspicuous and valuable service has been rendered by McCullough in the role of graduate adviser in chemistry, following an excellent start in this activity made by Blacet prior to accession of the latter to the department chairmanship.

This job of adviser has become an extensive and complex operation, involving not only admission of applicants in "full graduate" or "unclassified" status, but the
serious task of hiring large numbers of teaching assistants. Added to this comes a great deal of attention to cumulative and other examinations, plus delinquencies, plus encouraging "pats on the back" for the many top performers.

Reports from the Registrar in 1933 indicated that the department was conforming rather well with the original (Southern Branch) course grading standards:

<table>
<thead>
<tr>
<th></th>
<th>Lower Division</th>
<th>Upper Division</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>5.47%</td>
<td>9.84%</td>
</tr>
<tr>
<td>B</td>
<td>25.96</td>
<td>33.06</td>
</tr>
<tr>
<td>C</td>
<td>56.34</td>
<td>50.13</td>
</tr>
<tr>
<td>D</td>
<td>12.23</td>
<td>6.98</td>
</tr>
</tbody>
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A statement such as the foregoing about "conforming rather well" evokes sharp protest from certain faculty members, each of whom maintains - "I know an A when I see one, and don't propose to be regimented by any such artificial grading standard!" Unfortunately such declarations of independence lead, and are now leading, to gross discrepancies between standards of different professors and courses, with a tendency to soften the program.
CHAPTER 12

COMPLETION OF THE CHEMISTRY BUILDING

By 1933 the laboratory for quantitative analysis was already crowded, and this situation added fuel to the demand for completion of the Chemistry Building. Unfortunately the general UCLA administration had been "sold" on the idea of placing a theater for dramatic arts curricula in the projected new south wing. Plans were already on the drawing board. This scheme drew sharp protest from the Chemistry Department.

By way of compromise, the theater was pushed down into the basement and sub-basement area. The funds for all this, in the manner of the recent Physics completion job, were to come from sale of the old normal-school property at 855 North Vermont Avenue. The City of Los Angeles was scheduled to pay for this property in five annual installments.

Lo and behold! By the greatest good fortune, or left-handed good fortune, the City, beset with business-depression troubles, defaulted on the payment from which the Chemistry Building job must be financed. Unopened bids were rejected and the whole project postponed. In another year, however, the City collected its wits, fin-
ancially speaking, and the University learned that the
south wing of Chemistry could now be constructed.

Another piece of good fortune now turned up. The
new president, Robert Gordon Sproul, had now gotten time
to investigate the details of the complex job he had in-
herited, and had run into the chemistry theater contro-
versy. Being by undergraduate training an engineer, he
appreciated the renewed protest of chairman Morgan a-
gainst the theatrical cuckoo bird that still perched in
the 1933 architectural drawings. Briefly, the theater
was evicted. The administration was loath, however, to
order the entire plan redrawn with resulting extrava-
gance in architectural costs. Accordingly, Chemistry
was notified simply that the theater was out, and that
proposals were invited for a subdivision of the relin-
quished space into additional laboratories.

The new proposal was informally handed to Francis
Blacet, who with the help of colleagues promptly laid out
what was soon to be the famous sub-basement laboratory
group for graduate students. Considering the primitive
state of man’s knowledge in 1934 on two topics (a) labor-
atory ventilation, (b) building safety, the conferees did
a pretty good job, and it went through at extremely low
contract cost, as any good economics historian might have
guessed. The class of construction was even better than
that of the 1928 job, with adoption of a strictly class A, steel I-beam skeleton, reinforced concrete and brick finish as the body of the building. Now should any of the new social-science tenants of this south wing be on the job when the "size No. 7" earthquake hits Los Angeles, we beg to predict that they have a very good chance of survival if they will only sit tight! When at last in 1954 the University faced the new safety code requirements in conversion of Chemistry Building into Haines Hall, the workmen had a tough job cutting the new holes required for "second egress" stairways. Incidentally, the new supervising architect, David Allison, had foreseen this tough job in 1944-45, when University authorities presumed that the time had come when mathematics rooms were to be made over into laboratories.

As planning for the new south wing proceeded, Conger Morgan found himself from time to time in the predicament of having to go, hat in hand, to his old (A-grade) Chemistry 1A student, Roscoe A. Weaver. Roscoe had been appointed University project engineer in command of the south wing planning program. Now be it known that neither Conger nor Roscoe was in the classification known as "milquetoast," so that the correspondence between the two irresistible forces produced sparks at times. Brief samples may perhaps suffice:-
Roscoe: ".....Inasmuch as Sir Henry Morgan and his brother laid, in Jamaica, the foundations of the American Democratic Party (and taught them all the politics they know)" (!!!) "and inasmuch as the lineal descendants of said Henry and Bro. have always shown a partiality for their ancestors' work, I have serious misgivings as to the intentions behind your apparent vote of confidence. Our interpretation of your recent chiselling communications.....is enclosed.....Further constructive criticism not leading to increased costs is invited (italics ours)".

Gonger: ".........The only reason I can see for not letting the contractor do the job is that you think it unnecessary at the present time....."

Finally poor young Assistant Professor William G. Young, most juvenile member of the staff, decided to intrude on the south-wing building project himself. It seems that Bill had been pushed around a bit, 1930–34, and didn't even have a decent office all his own. Examination of preliminary drawings had revealed to him some awkward-looking space behind ventilating flues in the west end of the proposed structure, and Bill had carved out of all this (in theory) what purported to be a useful office and laboratory. At this juncture he had the temerity to urge the Morgan–Weaver board of arbitra-
tion to give him "a blackboard, an extra gas outlet and
an air oook." The board of arbitration, however, like
the classic Irishman and wife having a family fight,
turned on poor Young and panned him jointly. The sub-
ject was closed as follows, also by U.S. mail:

Roscoe. - "Dr. Morgan is correct in that you de-
serve to have a good deal of grief in getting estab-
lished.... There is a Higher Justice which automatically
metes out punishment to those who confuse simple minds
with a multiplicity of requests."

Regardless of jests, it is a fact that Morgan,
Weaver, Blacet and colleagues demonstrated in the new
structure marked advances over the designs of 1928.
Notable among these advances was the substantial space
economy achieved in the lockers for quantitative anal-
ysis and physical chemistry in the two new large labor-
atories. In these lockers the designers avoided the
large and wasteful center space which still (1959) is
insisted on by the manufacturers of "standard" island
laboratory benches. The same economies were carried over
into the design of the new equipment for the 1952 Chem-
istry Building, in spite of strong disapproval by the
Michigan manufacturers who insist on preserving their
standard designs.

In addition to the quantitative, physical and
general research laboratories, seven staff office-laboratory suites were provided. New space on the third floor went almost entirely to the Mathematics department for new headquarters.

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In 1938 someone had the bright idea of enticing postdoctoral research fellow C. D. Coryell away from his brilliant research director, Linus Pauling, to become the next member of the UCLA chemistry staff.

Charles D(ubois) Coryell, native of California, was awarded the B.S. at the California Institute in 1932, and the Ph.D. in 1935; thesis dealing with electrode potentials, directed by Arthur A. Noyes. During his period as "doctorant" of the Institute Coryell managed to squeeze
in a year (1933-34) as German-American exchange student at the Technische Hochschule in Munich. From 1935 to 1938 he was research fellow under Pauling, and joined the UCLA staff in 1938.

Advent of the war crises of 1943 took Coryell into a variety of war projects, far from Los Angeles, 1943-46, and the local department never was able to recover him. He is now professor at the Massachusetts Institute of Technology.

Although UCLA was able to hold Coryell for only a short period, it would never do just to brush the item by with a routine biographical paragraph. During his short stay, Charles made his presence thoroughly and favorably known on the local campus. Postdoctoral scholars who wonder why they don't make an impression here or there might well study this interesting personality. Not everything need be imitated; for example, common gossip was. Mrs. Coryell could never guess closer than about two hours on the time when Charles would get home to supper. Uncertainty as to duration of informal "seminars" was to blame for much of this. One trait, however, would unquestionably bear close inspection and reflection—and that was the phenomenal alertness of this young scholar. By the end of two years on the Los Angeles campus, Coryell was being consulted on a host of research problems and ideas, and the questioners were not all college kids.
CHAPTER 13

THE WAR PERIOD, 1939-1945

In the academic year 1938-39 the unprecedented decision was made to acquire two new instructors in organic chemistry. A department committee let this prospect be known in many places, and the file of recommendations, applications and photographs which the committee accumulated was wonderful to behold. Uncertainty as to availability of necessary budget appropriations made it possible to invite only one of the two prospective instructors well in advance. Perhaps a coin was flipped to determine priority when the two records were on the desk; if so, T. L. Jacobs seems to have won the toss.

Thomas L(loyd) Jacobs was awarded the A.B. degree at Cornell College(Iowa) in 1930, and the Ph.D. at Cornell University in 1935. His doctoral thesis dealt with the synthesis and ozonization of acetylenic derivatives, under direction of
J. R. Johnson. Jacobs then accepted one of the regular three-year appointments as junior instructor in chemistry at Harvard University (1935–38) and remained for one additional year on account of the sudden death of the distinguished Professor E. P. Kohler. In 1939 he became instructor at UCLA. Dr. Jacobs' original research interest in triply-bonded organic compounds has broadened, as summarized in a recent statement: Synthesis, polymerization, rearrangement, etc. of acetylenic, allenic and related unsaturated compounds; steric hindrance and stereochemistry. His career to date at UCLA has been characterized by a particularly well-balanced program in research, teaching and University service, all of outstanding merit. He finds sabbatical leaves critically necessary, not merely to keep up to date in scholarship, but to get out of committee chairmanships that are constantly being loaded onto him.

For the additional post in organic chemistry, the department had decided to invite the young man reputed to be Roger Adams' best postdoctoral fellow, but could not give a commitment on account of budget delays. The present writer wishes to express his appreciation to Professor Adams for giving T. A. Geissman a provisional guarantee of reappointment (if necessary) as postdoctoral fellow while the latter was hoping, week after week, for
decision at Los Angeles. In doing this Adams was running a big chance of missing a good replacement at Illinois. Finally on August 25 Morgan at last got approval on his second instructorship. The new appointee and wife grabbed the old Ford car and hied themselves west.

Theodore A(lbert) Geissman took his bachelor's degree at the University of Wisconsin in 1930, and served for the next four years as chemical engineer for the Standard Oil Company of Indiana. At this juncture, according to legend, Professor C. F. Koelsch, organic chemistry, University of Minnesota, got a big hunch. He dashed down to Whiting, Indiana, tapped the young engineer on the shoulder and decreed— "You are coming with me to Minneapolis for a doctor's degree!" Regardless of legend, true or false, Geissman went, and completed the Ph.D. project, working on alpha-diketones in 102
the cyclopentane series. The transfers to Adams' labor-
atory and then to UCLA followed in due course.

Since appointment at Los Angeles, Geissman was in
war service as civilian research chemist under the OSRD
at Philadelphia. During 1950–51 he was a Guggenheim
fellow, and engaged in preparation of radioactive drugs
in laboratories of the University at Berkeley, and of
the University of Utah. In 1957–58 he went farther
afield, spending the major part of a round-the-world
trip in a study of the chemistry of Australian floras,
with interruptions to give technical lectures in both
Australia and New Zealand. This last venture was part
of an extended period of research in the field of chem-
istry of plant pigments. Geissman's program is somewhat
broader, however, as recently summarized: Isolation,
structure and physiological action of naturally-occurring
substances; relationship between structure and activity
of drugs; chemistry and biogenesis of plant constituents.

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In mid-September, 1939 an unseasonable hot wave
struck southern California, giving the west Los Angeles
area a near-record temperature maximum of 108° F, far
above figures at the time even for such torrid zones as
Needles and Yuma. Professor Morgan, already under the
weather physically, was barely able to meet his class in
Chemistry 3 at 9 a.m., and 1A at 10 a.m. on the first day of instruction, September 18. By late afternoon store-keeper Robinson was called to take the chief home, and Morgan never met another class.

With Messrs. Young and Blacet in the East, attending the fall meeting of the American Chemical Society, the department was short-handed. Fortunately the new instructors in organic chemistry, Jacobs and Geissman, were on the job. Provost Earle R. Hedrick, notified of the emergency, directed that an informal meeting of the chemistry staff be held on Tuesday, without appointment of an acting chairman or "chargé d'affaires." At this meeting Jacobs was drafted to take the extra burden in organic chemistry, McCullough in Chemistry 1A, Dunn and Ramsey in advising and academic rulings, and Robertson for requisitions, payrolls and other department business. This informal "town-meeting" system continued for the following eight months.

Dr. Morgan hopefully maintained that he would return to his teaching schedule in February. On enrollment day, however (Feb. 9, 1940) one of the staff had the sad duty of posting on the department bulletin board a notice of new class assignments following the death of the chairman that day. Informal department procedures continued until May, 1940, when the present writer was appointed

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chairman to serve until July 1, at which date W. G. Young was expected back from sabbatical leave. Young then took over as chairman, serving until his later appointment as divisional dean of physical sciences led him to withdraw from the chairmanship. Francis E. Blacet then succeeded Young as chairman in the summer of 1948, and served in this capacity until the summer of 1956. He was followed by J. B. Ramsey, 1956 until retirement date, 1959, at which time Wm. G. McMillan assumed the chairmanship.

In accepting the chairmanship in 1940, Young stipulated that he had to have assistance in the business functions of the department. This led to the appointment of the present writer as "director of chemical laboratories." Although the new title was carried on the department roster until retirement of the holder in 1955, actually a gradual transfer of regular duties was arranged by Chairman Blacet over the period 1948ff, to allow the "director" to put in his whole administrative effort on the new building program. Duties thus transferred went into the hands of A. H. Sanberg as administrative assistant. Since the present writer did not draw any supplementary "director's" salary, there was no serious fiscal problem. Now to return to 1941 and to academic problems:

After watching one of UCLA's B.S.-M.S. graduates making his way in the world, with creditable record, for
six years, the chairman at UCLA couldn't rest peacefully any longer, and proceeded to "call back" the wanderer. Saul Winstein accordingly accepted an instructorship.

Saul Winstein, native of Montreal, took his bachelor's and master's degrees at UCLA, 1934 and 1935, and enrolled with Prof. Howard J. Lucas for the doctor's degree, awarded at the California Institute in 1938. The thesis dealt largely with addition reactions of olefins. Since this program did not fill up Winstein's time, he sandwiched in a semester as substitute instructor at UCLA during absence of a staff member on sabbatical leave. Winstein then served as postdoctoral fellow at the California Institute, 1938-39, and as National Research Council fellow at Harvard, 1939-40. He then spent a year on the staff of the Illinois Institute of Technology, Chicago, and transferred to UCLA in 1941.

Since Winstein joined the local staff, he has con-
tributed extensively to the Journal of the American Chemical Society in physical organic chemistry, including many subtitles under the general heading "Role of Neighboring Groups." Further notes on his work are given in a separate chapter on advanced study at UCLA.

In 1948 Winstein took the annual "American Chemical Society Prize" given to the young scholar (person under 36) who, out of this age group, in the opinion of the distinguished award committee, has made the most important research contribution of the year in chemistry in North America. In 1954 he was elected to membership in the National Academy of Sciences. He has held several important lectureships, including the famous Baker series at Cornell University, and has given many individual invited lectures both in the USA and in Manchester, London, Basel and other major European academic centers. In 1959 he addressed the Eighth Mendeleev Congress of the Academy of Sciences of the Soviet Union, held in Moscow. This commission was by invitation of President Nesmeyanoff of the Soviet Academy.
CHAPTER 14

POST-WAR EDUCATIONAL BOOM

In 1946 the Department decided to establish work in radiochemistry; that is, nuclear chemistry. For this purpose the appointment of C. S. Garner was approved.

Clifford S(ymes) Garner, native of New Jersey, took the B.S. degree at the California Institute of Technology in 1935. He continued directly to the Ph.D. degree (1938) with a thesis under guidance of Professor Don M. Yost. This work involved studies of hindered internal rotation with aid of low-temperature calorimetry. Garner then continued research at Pasadena, 1938-39, on a Noyes fellowship.

From 1939 to 1942 Garner was instructor and assistant professor at the University of Texas. In 1942 his transfer to the University of California, Berkeley, for war research, marks his shift of interest into the
nuclear field. After a short period of study with Giauque, Latimer, Eastman and Seaborg he went to the Los Alamos laboratory of the University, and was engaged in highly "classified" research on the atomic bomb problem until 1946, when he came to UCLA, where he is now professor. Topics of particular interest to Garner include the following:

"Hot-atom" chemistry; oxidation-reduction potentials.
Magnetochemistry.
Absorption spectra and characterization of ionic species.
Isotopic exchange reactions.
Application of tracers to inorganic reaction mechanisms.

In the fall of 1947 the department acquired, supposedly for a year only, a postdoctoral fellow who promptly
became a fixture and now long since has become a professor. This was D. J. Cram, at first an American Chemical Society fellow at UCLA.

Donald J(ames) Cram took the B.S. degree, major in chemistry, at Rollins College, Winter Park, Florida, in 1941. According to rumor on the Rollins campus, Cram was even more scintillating in philosophy than in chemistry, and narrowly missed a major in that profound branch of learning. He then took a master's degree at the University of Nebraska on a thesis topic dealing with (nitrogen) neighboring-group participation in chemical reactions. The balance of the war period was spent in research service in the antibiotic field with Merck and Company in Rahway, New Jersey.

After a period somewhat less than two years at Harvard as National Science Foundation fellow, Cram was awarded the Ph.D. under direction of L. F. Fieser in studies of 2-acyl-3-hydroxynaphthoquinones. From this work he came directly to UCLA, where (1947-49) he served as half-time instructor, half-time American Chemical Society fellow. He became assistant professor in 1949, and proceeded rapidly to the full professorship which he now holds.

In 1955 Cram toured Europe as Guggenheim fellow, and gave invited addresses at many major institutions,
including Imperial and University Colleges of London, Oxford, Cambridge, Zurich, Basel and Munich. He also received in the same year the so-called "California Award" of the American Chemical Society.

In 1956 Cram was invited as research professor and participant in ceremonies connected with new developments at the National University of Mexico. In 1958 he was invited to give a series of lectures at the University of Heidelberg, and lectured incidentally at several other European academic centers.

Dr. Cram's researches are of special significance in the fields of unsaturated large-ring compounds, transannular effects, asymmetric induction, and mechanism of Wagner-Meerwein rearrangements. During the summer of 1959 the McGraw-Hill Book Company published the new textbook "Organic Chemistry" by Cram and Hammond (of the California Institute), which is discussed elsewhere in this volume.
CHAPTER 15

AN ENTIRELY NEW CHEMISTRY BUILDING

In the summer of 1944, when both German and Japanese military fortunes were on the down grade, it was realized that UCLA would soon need extensive building construction. Accordingly, the new "Committee on Building Needs" became quite active. To be sure, physics and chemistry were supposed to be already provided for, and attention was directed to more needy departments. In July, however, the present writer became concerned over the fact that the Chemistry Building was almost completely surrounded with buildings or landscape features blocking the building expansion eventually needed. Royce Hall to the west, the central quadrangle to the south and a supposedly unusable ravine to the east left only one plot, to the north. Chairman Young's attention was called to the desirability of earmarking this north plot for the new structure needed not in the nineteen forties, but essential in future decades. Young at once asked the present writer for a brief on the case, and then backed up the new thesis with an emphatic letter of his own.

Accordingly, in correspondence of July 10 and 11 it
was proposed that the University abandon the old program of 1928, in which it was assumed that the Chemistry Department, in future years, would gradually take over the various rooms temporarily held by Geology and other tenants, and remodel these into laboratories. In a new plan it was held that the University needed the various classrooms and mathematics-geology staff quarters to house populous functions near to the Library and general classroom areas. The chemistry laboratories of second-, third-, fourth-year and graduate level, now in use in the present structure, should therefore be eventually remodeled as freshman laboratories, which would then be classed as "populous" and therefore entitled to hold a position on the main quadrangle.

Functions of advanced level, sophomore and above, evicted by the new plan, would then go into a proposed new chemistry building just north of the present chemistry structure. Chemistry library, research storeroom and various other features would follow along. Chemical engineering might also be added, and the chemical center of the campus would be definitely shifted. Although the scheme might seem extravagant, with a building only fifteen years old, emphasis was laid on the fact that the renovation of a geology office or mathematics classroom to yield a new advanced chemistry laboratory would be
difficult and expensive. Drilling reinforced-concrete floors for accommodation of new plumbing and flues would be a costly operation. Actually, ten years later, this surmise proved to be only too true, even when it was applied to the simpler job of remodeling Chemistry for social sciences.

The two documents for promotion of a new building, after passage "through channels," reached the Supervising Architect for UCLA, Mr. David Allison. This gentleman (Heaven bless his name!) had just dreamed up his new idea of the Court of the Sciences, an ornamental landscape center to be established just south of Moore Hall. The proposal to build a chemistry annex north of the chemistry building was wholly at variance with Allison's plans. With alacrity he threw out the annex idea, and recommended that the whole chemistry function, freshmen included, be removed to his Court, where a brand-new chemistry building should be constructed. This not only drew huzzas from the Chemistry Department, but to the delight of everybody met approval of both the local staff of Architects and Engineers, and the University Chief Architect Robert J. Evans. Approval of the Board of Regents followed. The old Chemistry Building was to be yielded to nontechnical, classroom and office use.

One little detail still remained, namely, the neces-
ary cash. It happened that the Geology Department, which of course was a "tenant" in the old building, was already on the building needs list for about three quarters of a million dollars. An early decision was thus made to tie Geology and Chemistry together once more in one building. Unquestionably Geology had no special enthusiasm for retention of their building associate, but couldn't do much about the matter. Actually by a joining of forces there was a prospect of getting something done, pleasant-smelling or not.

There now followed a period of minor financial jockeying, in which odds and ends of building funds were put together in trial budgets. Funds earlier earmarked for the Greek theater, which had been pushed into oblivion by the School of Medicine, were put into the reckoning. The best that could be dreamed up was a little over two million dollars for chemistry and geology. But Dr. Young, always appreciative of main issues, decided he really had one now. Higher authorities, all the way to Sacramento, were vigorously told the truth, namely, that two million more must be appropriated, or the whole project was impossible. Mr. James H. Corley, whose duty it has been to explain fiscal needs to the Legislature, conceeded the point, and did his bit to land the legislative appropriation. To be sure, after the job was done, Cor-
ley's conscience was smitten. As Vice-President-Business Affairs, he feared that we had led him to drive the State of California into extravagance. In brief, maybe he had built too much chemistry building! In a cheerful attempt to shift some of the responsibility, he suggested informally, very informally, that the new structure of 1952 be named "Young's Folly." After looking at the 1960-1970 building proposals, we now suggest that Mr. Corley need no longer be badgered by his conscience.

Following consultations between Supervising Architect Allison, Landscape Architect Ralph Cornell, and the various administrative authorities of the University, the plot next south of Franz Hall, on the new Court of the Sciences, was assigned to Chemistry and Geology. A faculty building committee, of which the present writer was to be chairman, included two other chemists (Young and Blacet) and two representatives of Geology. The firm of Kaufmann, Lippincott and Eggers, later Kaufmann and Stanton, still later Stanton and Stockwell, was given the job as "executive" architect; that is, the private organization which does the main job and receives the principal stipend for planning.

In line with standard custom, Mr. Gordon Kaufmann, in cooperation with the local Office of Architects and Engineers, called upon the Committee for the appropriate
statistical summary of space needs, in detail by function. Each of the two departments prepared its prospectus, the total running to about 165,000 square feet net useful area. The University administration pondered this for a time, and finally laid down the dictum that 150,000 sq. ft. was the maximum which could be safely planned on the announced appropriation of a little over $4,600,000. It was then immediately agreed that this quota of 150,000 should be divided between geology and chemistry in the ratio already set by the two gross requests of the two departments. This ratio was approximately 68% chemistry to 32% geology. At the time the 68:32 ratio seemed to outside authorities as rather heavily weighted in favor of geology, in view of the great service functions and large industrial significance of chemistry. More recent growth in geology, and particularly in geophysics, makes the situation now seem more realistic.

With statistics at hand, Architect Kaufmann now had the responsibility of a general plan. Incidentally, this situation is a splendid illustration of the advice to faculty not to attempt to regiment an architect in placement of main units of his building, but rather to show the mechanical requirements of traffic between these units, and let him show his own professional skill. This program went beautifully, in view of Mr. Kaufmann's high
architectural competence. To be sure, the chairman of the committee had rather elaborate prior notions of a certain method of arrangement, but these were rejected in favor of the much better scheme, and much more attractive layout actually adopted by Kaufmann.

This reversal is cited to show the superiority of a plan then followed by the committee, namely, to present an analysis of space relations in symbolic form. Briefly, this analysis had as its principal feature the realization that Los Angeles possesses a very mild climate; that corridors do not all have to be indoors, as in Minneapolis and Montreal. Architects trained in severe climates, on coming to southern California, do not always realize that they do not have to pack everything together in a tight box. To be specific, in the present case there was no need of indoor corridor connection between geology and chemistry. These departments had been placed together merely for budgetary reasons. An interconnecting passageway, under rain shelter only, would suffice.

Another principle was set forth, this one perhaps not meeting such unanimous approval: The center of the chemistry building should not be the chairman's office, but instead the research and divisional storerooms. And so Mr. Kaufmann was given a simple diagram, without ar-
chitectural model, showing the fundamental relations. This picture had nothing to do with appearance, size, or direction. It dealt only with the fundamentals of inter-connection, referring to main functions as lettered.

G - Geology building  LL - Lecture rooms
G-Ad Geology administration (later library also)
G-S Chemistry storerooms
G-Ad " administration
L - Chemistry laboratories

On this basis Mr. Kaufmann promptly created the present plan, with administrative offices and lecture halls opening onto the court of chemistry and geology. The scheme was accepted with enthusiasm, and the resulting building has substantiated Mr. Kaufmann's fondest hopes. The central auditorium, ready in 1952, was promptly adopted for academic senate meetings and has frequent assignments for meetings of convention type.
The sad part of this narrative followed almost immediately. Shortly after the preliminary plans were established, Mr. Kaufmann was stricken and died. Fortunately there were still the competent services of Mr. J. E. Stanton, partner, and particularly of the junior "first lieutenant" in the firm, Mr. William F. Stockwell, who took over a major part of the burden in splendid style. The Supervising Architect retired at about this time, and was succeeded in the advisory role by Mr. Welton Becket.

As "project architect," representing the Office of Architects and Engineers, Mr. George N. Walker was appointed. This gentleman promptly found himself between the devil and the deep sea in a struggle(a) to get an adequate building built, and (b) satisfy the admonitions for strict economy laid down by the central University administration. It is hoped that the new policy of decentralization recently enunciated may make it possible to get final local decisions more promptly, no matter how rigorous the economy may be at the time. This of course should include adequate funds for unforeseeable contingencies - which unfortunately George Walker did not have. The University was fortunate in getting contracts which could be supported by "firm" bids before the Korean-War inflation, and the building was obtained at less than
$30 per square foot net useful area.

During the period of construction, the committee was fortunate in having the keen interest and cooperation of Dr. Robert L. Scott of the local staff in physical chemistry. This benefactor learned so much about the project that he got the job of chairman of the building committee for the "Chemistry Building Addition," due for construction in the early nineteen-sixties. At the present writing plans and specifications are already at the disposal of the architects.

Finally, on August 4, 1952, after labor strikes, delay in furniture deliveries, etc. the Chemistry Department moved to the new structure. The event was celebrated with the aid of Mr. Harry D. Williams, University Photographer, in a good-bye picture taken on the south steps of the old chemistry building, now known as the Charles Grove Haines Hall.

Acquisition of a new building immediately led to much better research facilities. Aside from the twenty-four faculty research laboratories adjacent to the faculty offices of like number, space for approximately 100 graduate students and 13 postdoctoral fellows was available. Many additional junior scholars found work places in the "private" faculty laboratories as well. On the third floor in particular in particular was located the
highest concentration of student research laboratories, in position most convenient to the main research store-
room. Of like significance was the marked expansion in service shops and laboratories, including the following:

Organic microanalysis, occupying an airconditioned laboratory with micro and semimicro balances, micro com-
bustion furnaces and special equipment for Dumas, etc. analyses.

Glass shop, with large Litton glass lathe, cutoff and spotwelding tools, horizontal and vertical annealing ovens, crossfire and blast lamps and general laboratory equipment.

Electronics shop, representing functions which have been growing much ahead of forecast. This kind of activ-
ity is relatively new in chemical research institutions. The Department has been compelled to increase space for electronics already, much in advance of the projected Building Addition.

Nuclear chemistry laboratories, with California hood and a variety of detection equipment. Nuclear apparatus is spreading over the building, much beyond the conventional limits of the radiochemistry staff proper, notably in organic chemistry and biochemistry.

Machine shop, with all new equipment in view of the withdrawal of our shop staff from their temporary places

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in the Central Machine Shop operated by Physics.

Airconditioned laboratories housing both the older and newer instruments for spectrometry, including UV and IR, mass spectrometer and later a Varian nuclear magnetic resonance instrument. X-ray and electron-diffraction equipment appeared on the first floor, adjacent to photochemistry and spectrophotometry.

Numerous smaller instruments and appliances, including precision polarimeters, polarographs, magnetic balance, Warburg apparatus, chromatographic devices for both liquids and gases, and high-pressure hydrogenation equipment in armorplated quarters.

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As the above plans, construction and purchases were in active progress, 1946-1952, it was obvious that new academic personnel would be needed. The Department did not wait for moving day. Among the first new appointments was that of another UCLA chemistry major who had made a name for himself, namely, W. G. McMillan. The next chapter gives details of this and other appointments.
New Chemistry Building and Court of the Sciences, as they appeared in the fall of 1952.

No attempt had yet been made to landscape the Court. Beginnings of the bio-medical facilities may be seen in the lower right-hand corner of the picture.
CHAPTER 16
NEW ACADEMIC STAFF

William G(orge) McMillan, native of southern California, took his bachelor's degree, major in chemistry, at UCLA in 1941. He then attained the M.S. degree (1943) and Ph.D. (1945) at Columbia, with doctoral thesis on the topic "Statistical Thermodynamics of Multicomponent Systems," under direction of Professor J. E. Mayer. By this time McMillan had already had several months' experience in a connection with the famous Manhattan Project; at first under Columbia sponsorship, later under management by the Union Carbide concern.

In 1946 McMillan was in Chicago on a Guggenheim fellowship, and in 1947 came to UCLA. In 1951-53 he went to Harvard University as Garoathers Visiting Professor during temporary absence of Professor Kistiakovsky from regular class service. Long since advanced to the professorship at UCLA, McMillan took office in July, 1959 as chairman of the UCLA chemistry department.

A recent summary of McMillan's research interests includes molecular interaction in adsorbed phases and in the liquid state; quantum mechanics of molecules; statistical theory of atoms, molecules and nuclei; in brief, rather highly mathematical physical chemistry.
In 1959 the Department had the opportunity to add a second graduate student in nuclear science to the program, Dr. W. J. Van der Graaf. Upon entrance, a bachelor degree from the University of Nebraska was conferred. The student was active in the radioactivity group of James and Bohnet. He was a native of Nebraska.

THE NEW CHAIRMAN OF JULY, 1959

WILLIAM G. MCMILLAN
In 1943 the Department had the opportunity to add a second staff member in nuclear chemistry in the person of Dr. R. A. James.

Ralph A(rthur) James took his bachelor's degree in chemistry at the University of California, Berkeley in 1942. The next four years found him in the so-called "Metallurgical Laboratory" in Chicago, with prime interest in nuclear science. After return to Berkeley he was awarded the doctor's degree with thesis on the chemical and radioactive properties of americium and curium. Actually, James and another junior researcher, under guidance of Seaborg, were the discoverers of these two new radioactive elements.

Following completion of the doctoral program, James was a member of the UCLA chemistry staff for eleven years, and then transferred his interests to another division of California's radiochemical research, accepting appointment as assistant chemical director of the Ernest Orlando Lawrence Laboratory at Livermore, California.

The postwar educational boom was now on, and still more educational staff was needed. Once again came a transfer from Berkeley in the person of R. L. Scott.
Robert L(eane) Scott, native of California, received the B.S. degree at Harvard (1942) and M.A. at Princeton (1944). In 1945 he completed work for the Ph.D. at Princeton under Professor H. S. Taylor, with thesis topic—"Thermodynamics of High-Polymer Solutions."

From 1944 to 1946 Scott was employed in the Manhattan Project, first at Princeton and later at Los Alamos. He was then Frank B. Jewett fellow at the University of California, Berkeley, in collaboration with J. H. Hildebrand. Scott's very pleasant professional fellowship with Hildebrand promptly led to adoption of the junior worker as co-author of a new edition of the famous monograph, "Solubility of Non-Electrolytes." Finally in 1948 Scott transferred to UCLA as assistant professor.

In recent years Scott has been especially interested in the physico-chemical problems of fluorocarbons; also statistical thermodynamics of liquids in general, and in molecular complexes.
By 1948 the department was seriously in need of additional staff in analytical chemistry, and thus R. L. Pecskok was invited from Harvard.

Robert Louis Pecskok, native of Ohio, took the bachelor's degree at Harvard in 1940, and held a position in manufacturing operations with Procter and Gamble, 1940-43. This was followed by service in the U.S.N.R., 1943-46, including work at the University of Chicago in the position of aerological officer, and also in the east Asiatic zone in naval combat.

During the years 1946-48 Pecskok was back at his alma mater in quest of the Ph.D., under direction of Professor J. J. Lingane. Principal topics of the thesis were the polarography of chromium, and determination of nitrate ion with chromous ion. Pecskok then came to the Los Angeles campus. Since arrival here, he spent the year 1956-57 as Guggenheim fellow in Copenhagen.
Recent activities of Peacock at UCLA include much emphasis of electroanalytical methods, especially polarography. Also are included investigations of constitution and of oxidation potentials of complex ions; borohydride chemistry. Under his guidance, special conferences, or courses of instruction, have been presented at UCLA in the field of gas chromatography.

By this time it had been pretty well demonstrated that a Ph. D. from the California Institute - particularly one that had continued into postdoctoral status at Pasadena, is likely to be a good bet. Accordingly, the nod was given to another physical chemist, K. N. Trueblood.

Kenneth N(yitray)
Trueblood took the bachelor’s degree at Harvard in 1941 and the Ph.D. at the California Institute in 1947. His thesis dealt mainly with theory of chromatography, and was under the guidance of both Lucas and Corey of the Institute staff. In a postdoctoral fellowship
year Trueblood investigated amino acids by X-ray spectrography. In 1949 he joined the UCLA staff, and has taken part in both physical chemistry and general (freshman) chemistry activities. One more recent interest is in the special course for superior freshman students which he initiated in 1958.

In recent years Trueblood has been emphasizing the application of such time-savers as high-speed digital computers to the graphic records of X-ray spectrography.

Increasing academic loads in analytical chemistry, and heightened interest in instrumental analysis led to an invitation in 1950 to P. S. Farrington, who then came as instructor.
Paul S(tephen) Farrington, native of Indiana, received the B.S. degree at California Institute in 1941, and then served as industrial chemist for Kelco (San Diego) for a year. Returning to university work, he took the M.S. degree in 1947 and Ph.D. in 1948. He was then associated for much of his subsequent postgraduate time with Professor E. H. Swift at the Institute, and had considerable responsibility in the analytical instruction conducted by Swift. In 1950 he was awarded the Ph.D., much of the research being under direction of Swift, in the field of coulometric titrations. In 1950 he came to UCLA as instructor.

A recent summary of Farrington's research interests includes amperometric analysis; ion exchange; extraction of inorganic complexes by nonaqueous solvents, and constitution of inorganic complexes.

With more adequate laboratory space in sight, the University at last was able to give Dr. Dunn some staff assistance in biochemistry — thirty years after the lone worker himself had started on the Vermont Avenue campus. This meant the appointment of D. E. Atkinson as assistant professor.

Daniel E(dward) Atkinson received his B.S. degree in agronomy at the University of Nebraska in 1942. An
additional year was devoted to biochemistry. War years (1943–46) found Atkinson as radio-materiel officer in the USNR. He then served one year as graduate student at Yale in plant physiology, and in 1947–49 at Iowa State College. In 1949 he took the PhD. at Iowa on the thesis "Factors in the Biosynthesis of Tryptophan and Tyrosine by Lactobacillus arabinosus."

During 1949–50 Atkinson was research fellow in biology, California Institute, and served as associate plant physiologist at the Argonne National Laboratory in Chicago, 1950–52. He was finally appointed assistant professor in the chemistry department at UCLA.

Atkinson's research interests lie strongly in the field of metabolism, especially oxidation-reduction processes; also "biosynthetic pathways" and enzymic mechanisms.

The department thought it had succeeded in bringing in a second new staff member at once for biochemistry. Appointment was duly authorized for C. A. West, newly-
graduated Ph.D. from the University of Illinois. But the draft board could not see things in that way. Before West could get settled, they shipped him off to the Army, where he (1953-4) did various things in a medical laboratory that could have been accomplished by some other young man, let us say somebody with a junior-college diploma. At last he was able to return to the UCLA job waiting for him in 1954.

Charles A(l len) West, A.B. De Pauw University, and resident of Indiana, attained the Ph.D. at the University of Illinois under the direction of Professor Herbert E. Carter: thesis topic: "Studies on an Amino Acid Degradation Product of Streptothricin."

A recent listing of West's research interests includes such topics as metabolic pathways, biogenesis of plant growth-regulating substances and antibiotics; also isolation and characterization of natural products with physiological activity.

Increasing interest in instrumental analysis gave direction as well as emphasis to the search for an additional physical chemistry for the local staff. This led to the appointment of Daniel Kivelson.

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Daniel Kivelson, native of New York City, took his A.B. at Harvard in a combined major; as they say in Cambridge, Mass. he "concentrated" in both physics and chemistry. His thesis for the Ph.D at Harvard, directed by E. Bright Wilson, Jr. dealt with problems in molecular spectroscopy. Following a short period as instructor in physics at the Massachusetts Institute of Technology, Kivelson came to the UCLA chemistry department.

Kivelson's current research interests run strongly to instrumental technology and theory, including nuclear and electron magnetic resonance, and study of free radicals and reaction kinetics by spectroscopic methods.

It now looked as though consideration should be given to inorganic chemistry. Such a project would naturally lead to the University of Illinois. The result in this case was W. C. Drinkard.
William C(charles) Drinkard, Jr., native of Alabama, was awarded the B.S. degree at Huntingdon College(Ala.) in 1950. He then studied for the M.S. at Alabama Polytechnic Institute in a research program investigating the physical-organic phases of the chemistry of organophosphorus compounds, degree granted in 1952.

After a year of service as chemist for the Westvaco Division of Food Machinery and Chemical Corporation, Drinkard spent the period 1953–56 at the University of Illinois, taking the Ph.D. degree in 1956 with thesis on the thermal and oxidative stability of co-ordination compounds, with Professor John C. Bailar as director. He also put in a short period of summer service(1955) for the duPont Company on the purification of metallic sodium. In 1956 he accepted appointment at UCLA, and has been taking an active part in the development of freshman instruction as well as his continued program in the field of co-ordination chemistry.

Current research interests in Drinkard's laboratory include effects of complex-ion formation on the properties of the ligand, especially effects of charge field
and stereochemistry; co-ordination polymers; hydrogen bonding; thermal stability of co-ordination compounds.

In view of the substantial offerings in physical organic chemistry already featuring department activity, the University was interested in balancing this phase of organic chemistry with an extension of operations in the domain of naturally-occurring compounds. This desire led to the appointment of J. B. Hendrickson.

James B(riggs) Hendrickson, native of Ohio, took his B.S. degree at the California Institute of Technology in 1950, and followed this with M.S. (1951) and Ph.D. (1955) at Harvard. In the latter work he had joined the research staff of Woodward, internationally-famous for developing laboratory syntheses for complex alkaloids. Hendrickson's thesis was devoted to studies in the synthesis of strychnine.

During the period of study for the doctorate Hendrickson held an (American) National Research Council fellowship under D. H. R. Barton at Birkbeck College, University of London. He later returned to Woodward's
laboratory as postdoctoral research fellow, 1955-57, and then came to UCLA as assistant professor.

As researcher in the field of naturally-occurring compounds, Hendrickson is concerned with problems of degradation, structure elucidation and total synthesis; also in chemical approaches to the biogenesis and phylogenetic relationships of natural products.

Two more additions to the staff now followed. Mark Cher, native of Argentina, took the B.S. degree at California Institute in 1954, and A.M. at Harvard in 1955. With thesis directed by Kistiakowsky, he was awarded the Ph.D. at Harvard for physiochemical studies of gaseous detonations. Cher came to UCLA as instructor in 1957. Recent research interests include kinetics of very fast reactions in the gas phase, and application of ultrasonic techniques to chemical kinetics.

For the second appointee, the invitation went to the famous organic division at the University of Illinois.
Kenneth Conrow, native of New Jersey, took his bachelor's degree (with honors) at Swarthmore in 1954. He then entered candidacy for the doctorate under guidance of Professor Nelson J. Leonard at the University of Illinois. The thesis topic dealt with nitrogen compounds related to certain known alkaloids. In 1957 Conrow came to UCLA as instructor. A recent summary of research interests includes synthesis and reactions of non-benzenoid aromatic compounds and cyclic hydrazines.

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In 1958 the department filled its fourth and last biochemistry staff office — as far as the present building is concerned — with another Illinois Ph.D., R. A. Smith.
Roberts A(ngus) Smith, native of British Columbia, took the degree of Bachelor of Science in Agriculture (B.S.A.) at the University of British Columbia in 1952. In 1953 he was awarded the M.Sc. at the same institution in agricultural microbiology. Transferring to the University of Illinois, Smith attained the Ph.D. in biochemistry (1957) under the direction of Professor Irwin C. Gunsalus, and was immediately drafted for a year's service as junior instructor on account of an unexpected shortage in teaching staff. Smith's doctoral thesis was entitled "Phosphoryl-Coenzyme A, an Intermediate in Enzymatic Succinylation of Dihydrolipoic Acid." Current interests include studies of biological mechanisms, including oxidative and photophosphorylation processes.
CHAPTER 17

ADVANCED STUDY

For more than a decade the Department operated under a strict ruling that seems incredible to eastern scholars. Positively no graduate study, nor laboratory for such study was permitted on the Los Angeles campus. To be sure, very small individual faculty research laboratories were permitted in the 1929 Chemistry Building. When at last graduate study was approved, space in undergraduate laboratories had to be worked over wherever possible.

The no-graduate-study rule caused embarrassment to students. One young man of outstanding scholarship, who wished to spend five years in order to cover extra courses, got the bright idea of omitting the legally required course in American Institutions, thus preventing him from graduating (by compulsion) in the normal four years. He was still an undergraduate! He now continued, finished the desired courses, including American Institutions in the last semester. Immediately he was graduated and evicted, but of course in an educated condition.

So passed the first decades on the Los Angeles campus. Next came the remarkable period of the thirties, which is the main topic of this chapter; finally the outstanding
development of graduate study in the forties and fifties, cited in Chapter 18. Many persons, however, do not realize the special significance of the intermediate second decade, known to economists as the terrible nineteen-thirties. It is the undergraduate instruction, notably that of the upper division, in this period of business hardship, that was significant. The present writer is not alone in his fear that the techniques of that era have been forgotten as attention was absorbed in the splendid graduate program of the forties and fifties.

An inquiry among chemistry-major students of that time, A to C in grade, is often revealing. These folk, many of whom are in major technical positions today, have had the opportunity to compare their training with that of hundreds of chemistry graduates of more conventional university systems. The results of such comparison are not unfavorable to UCLA.

To be sure, it is probably true that the UCLA chemistry department was blest with a larger number of gifted chemistry majors during the thirties than it is today. A popular explanation of this decline holds that general public poverty in the depression years made it impossible for many high-school graduates of top intellectual rating to attend the famous private colleges of high class but high tuition level. Such youths could afford only the
almost free education at the state university in their own home county. By contrast, continues this story, the talented youth of today is likely to have a prosperous dad who can send him anywhere. Or he may get a scholarship subsidy from some national philanthropic institution unknown in the depression period. Finally, when he arrives at college or university he finds new and glamorous goals such as nuclear physics, rocketry, and modern business-administration curricula. He is thus diverted from the profession of chemistry.

The foregoing string of excuses for the decline of enthusiasm as well as performance in undergraduate chemistry, while important, does not tell the whole story. The record of the University of California, Riverside, another beginner which up to 1959 has had no graduate study, is also outstanding in the art of inspiring science majors to enter postgraduate professional study. Pomona and Reed colleges also rank high, though these have certain special advantages to offer. Perhaps a scrutiny of educational methods in the UCLA chemistry department during the nineteen-thirties might throw light on the problem.

This chronicle has already noted that Chemistry was not approved for graduate study in the first rulings of 1930 nor for a long time thereafter. Eleven years were
to pass before the first doctorate was granted in chemistry; a few masters' degrees intervened. Attention was directed largely to gifted undergraduates, and many of these achieved an undergraduate education simply out of the class of the conventional course-takers in a large university of normal type. Some of these undergraduates assisted in two, three or even four major courses before they took the bachelor's degree.

The educational doctrine of think vs. memorize, try-out instead of cookbook, was noteworthy in the undergraduate teaching of W. R. Crowell in analytical chemistry. A laboratory assignment was not a run on some supposedly perfect set of analytical directions. In the local procedures, which incidentally required long hours of instructors' time in the laboratory, Crowell co-operated with J. B. Ramsey, H. W. Stone, and even with a more distant colleague, Wendell M. Latimer of Berkeley. In supposedly "standard" determinations, e.g. gravimetric sulfate procedures, there was frequent test of the advisability of change in temperature, concentration, time, acidity or adjunct salt content.

The present writer has heard a teacher of analysis boast that his students "do more unknowns" in a semester than they did elsewhere; but it wasn't Crowell. There were at Los Angeles no tedious "marathon analyses" in
which several components from one complex mineral were assayed — alas, with deadly repetitions of technique already learned. A clear distinction was made between experiments requiring high precision and those where 5%, or even 10% error was acceptable and expected with the compensation of fast procedure. Emphasis was laid on the futility of conducting a precise measurement based on a "standardized" reagent whose concentration was known only approximately. Each new experiment called for a new principle of technique, and usually each suggested a new research problem to those whose minds were working.

No formal, nationally-established text and manual were used. Instead, Crowell used his own frequently revised notes which never reached New York publishers, and thus are not recorded in Chapter 21 of this volume.

Most significant of all was the multitude of undergraduate research problems, large and small, most of which were never reported to the Journal of the American Chemical Society. For example, witness an incident when "Bill" McMillan (future chairman of the Department) and "Jack" Roberts (future professor of organic chemistry, California Institute of Technology) were laboratory partners in the senior class in physical chemistry, course 111. With determination plus enthusiasm written on their faces, these two entered the office of the present writer, sat down and looked wise. The following interview, as
best we remember, ensued:—

Instructor (with mock impatience) "Now what do you fellows want?"

Visitors — "Have you got any rubidium salts?"

Instructor (with continued "impatience") — What on earth would you do with rubidium if you had it?" (Extremely costly chemical, of course).

Visitors — "We are supposed to run the experiment on transference number with potassium chloride, and have a hunch that the determination hasn't been done on rubidium ion, which being heavy has interesting possibilities."

Of course their class instructor, Professor McCullough, who happened to have no rubidium anyway, could not have justified the use of such expensive material in the regular class experiment in Chemistry III. A perfectly good procedure, with details well tested in a previous semester by Professor Ramsey, had been inherited for the semester by McCullough, and this used inexpensive potassium chloride. But there was no discouragement either by McCullough, Ramsey or the present writer on the new proposal. The more important problem was how to get the rubidium, and this question was somehow answered. The two laboratory partners got into five times as much trouble as the routine workers on potassium chloride.
Thanks to the perversity of rubidium, the numerical results were probably not half as good. But the two investigators knew something about moving-boundary technique when they finished the experiment. What is more, they were professionally happy. Somebody had lit the fire of physical chemistry under these young men.

In organic chemistry other schemes were tried. During one term half of a newly-projected laboratory manual was literally written by a second-semester junior laboratory class, Chemistry 101. Each student chose an experiment, was appointed "director of research" on that experiment, searched the literature, and first perfected to the best of his ability the directions for performance. Copies of the new directions were in turn submitted to his fellows, and underwent criticism by testers who had no bashfulness in pointing out deficiencies, either in laboratory procedure or in scientific English. This program was not just a list of "exercises," but a real job which the New York editor was pointedly calling for. It was not run by teaching assistants!

In other organic classes individual students interrupted the stock program of Assignments 1, 2, 3, etc. to carry out a single very short research problem, leading to a scientific paper written according to the editorial rules of the American Chemical Society. Such papers were
rarely important enough actually to appear in a Society journal, but the opportunity for real training in fundamentals was nevertheless there. The papers were personally criticized by the instructor in the presence of the young authors, one by one, in office conferences. One must confess, right here, that such a time-consuming process, however valuable, is simply not practical when graduate study is really in operation.

In an advanced class of inorganic chemistry young David N. Hume (now a leading staff member in analytical chemistry at Massachusetts Institute of Technology) was interested in an assignment involving zinc amalgam. With inspiration of the instructor, the special job expanded into a "Chemistry 199" or senior research problem, and this time the conclusions appeared in the columns of Analytical Chemistry, principal American journal in this field. This job was directed by Professor H. W. Stone, not by a teaching assistant!

The contributions of Stone to the think vs. memorize program were not confined to this instructor's nominal field, inorganic chemistry, but were added to those already outlined in the above summary of Crowell's concepts in analytical chemistry. A considerable part of the analytical program was carried out by Stone himself, particularly in Chemistry 5A.
As suggested elsewhere in this narrative, Dr. Max S. Dunn contributed heavily, in still different ways, to the unique program of the thirties. Dunn's crowd had so much to do that they never had time to clean up their laboratories, but they got a lot done. The question is still open whether the most research is done in neat, orderly laboratories, or in scientific slums.

This critical undergraduate program, throughout the department, stimulated the interest of top-grade students, as one might expect. One wasn't always sure how much we could credit to hard work, and how much to brilliance. One of the best of the young performers, Glenn T. Seaborg, claims that he "worked like the devil" as an undergraduate in the Los Angeles department. We must make some allowances in this case for native ability, however.

Outstanding in the system of undergraduate inspiration was the physical-chemistry program of J. B. Ramsey. Like Crowell, Ramsey "wasted" no time composing a textbook or laboratory manual in his own particular field. Instead of a list of perfectly standardized, logically ideal course experiments, marketed nation-wide by Wiley, Macmillan or McGraw-Hill, Ramsey's jobs were studded with opportunities here and there to convert "assignment" into "research problem." To be sure, Ramsey got the reputation
of being a slave driver, but no permanent damage seems to have resulted.

Another of the faculty of the nineteen-thirties, William G. Young, made signal contributions to undergraduate instruction both at elementary level and in elementary organic chemistry. With Young, however, as in the case of his colleague soon-to-be, Francis Blacet, there was little schedule opportunity to take part in advanced courses until graduate study finally arrived. Accordingly, Young and Blacet threw their main efforts into the building of a foundation for the new graduate school, with results discussed elsewhere in this narrative.

Such liberal laboratory policies illustrate to advantage what may be the ideal undergraduate assignment—at least for levels above freshman grade, namely, tasks which are sufficiently standardized and "polished" that the mass of orchard-run, ordinary students may accomplish something valuable without confusion. At the same time the gifted student has plenty of opportunity to stretch his grey matter on special phases of the laboratory work that are suited to his capacity and training. Thus does it happen that not all laboratory teachers believe that the A students should be herded into classes or sections entirely removed from the C people.

Whatever may be the individual opinion of this or
that instructor on the segregation of A and C students, the present writer would maintain that it is not satisfactory, from the morale standpoint, merely to pack the undergraduate program with stock information and predigested reasoning alone, on the theory that the student is not yet mature enough to engage in research. Postponement of research attention and assistants' jobs entirely into the graduate zone, now an accomplished fact at UCLA, has had the same unfortunate effect noted in other populous universities.

One notes also that the segregation of A from C and D students has a stultifying effect on the poor devils who have to teach the less competent sections of a large class. To be sure, the system of sectioning on the basis of ability has been quite popular in certain universities. We fear, however, that this great popularity has been principally in the domain of leading professors who got the A sections!

Comments of the type presented in the foregoing paragraphs are likely to encounter protest from present-day staff who maintain that their junior and senior laboratory programs also include special problems with research stimulus. This is true in theory. That is, the laboratory schedule calls for such choice of problem assignments. But the administration of such laboratory
work does not get the hours, days and weeks of personal faculty attention that used to be available. For example, the current instructor, primarily interested in graduate studies, will not be found giving time personally instructing an undergraduate in the technique of writing a scientific paper. Instead of personal instruction by a faculty member, attention of a teaching assistant will certainly be substituted.

One must concede that such smaller institutions as Pomona, UC Riverside (temporarily?), Reed, College of Wooster, Swarthmore, etc., despite their obvious lack of research equipment and chemical library, have a natural advantage in the art of inspiring prospective graduates. But this is not the whole story. Some of the most serious criticism of the local situation has come from certain teaching assistants in chemistry at UCLA who are transfers from large universities, not small colleges, elsewhere. These witnesses are in excellent position to make comparisons, since they have functioned first as undergraduates at their alma maters, and now as local assistants in the same kind of courses. Their testimony at times has been unfavorable to the local regime in the undergraduate field. These young assistants are not disgruntled complainers; they are enthusiastic about their own local graduate programs. They simply realize that
the pendulum has swung over excessively to the graduate side of academic life.

An interesting start on the revitalization of undergraduate chemistry has been made by Dr. K. N. Trueblood, and other staff members are expected to cooperate in the plan as the years roll by. In this plan, listed as Chemistry 3A-3B, gifted freshman students have the opportunity to cover the work of two semesters of general chemistry (1A-1B) and one of analytical chemistry (5A) in a total of two semesters. It is of course too early to evaluate the results of such a system, but the present writer begs to offer the following prediction: If, as we anticipate, better education of A-grade students is attained, it will be largely because Trueblood, an experienced research scholar, personally and enthusiastically directed the work in office and laboratory, and not to any great extent because the new curriculum tricks are a panacea for ignorance. Trueblood's experiment, of course, is only at the elementary level, and the Department still has the problem of upper-division instruction.

---

At the risk of some partial errors in logic, it is interesting to examine the award records of young men in the annals of the American Chemical Society, as related to the UCLA chemistry personnel of the nineteen-thirties.
During the twelve-year period, 1947-1958 inclusive, when the former undergraduates (of the thirties) were in their prime years of research achievement, chemistry majors with bachelors' degrees from UCLA won four out of the twelve annual thousand-dollar "American Chemical Society Prizes." In each of these awards a distinguished national committee selects the "young" chemist (by definition, under 36) whose research achievement, in its age class, in their opinion has been the most important of the year in North America. The local winners were the following:

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. T. Seaborg</td>
<td>1947</td>
</tr>
<tr>
<td>S. Winstein</td>
<td>1948</td>
</tr>
<tr>
<td>J. D. Roberts</td>
<td>1953</td>
</tr>
<tr>
<td>E. M. Grunwald</td>
<td>1958</td>
</tr>
</tbody>
</table>

Dr. L. Reed Brantley (graduate in chemistry, UCLA, now Chairman, Chemistry, Occidental College), takes part, as Grand Master Alchemist of Alpha Chi Sigma Fraternity, in the ceremony of award to Dr. Ernest M. Grunwald (left). He thus acts on behalf not only of the American Chemical Society, but also of the Alpha Chi Sigma group, who originated the award and made financial contribution thereto. (Illustration from Chemical and Engineering News)

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Even as Grunwald was receiving the ACS award, another UCLA chemistry major of an earlier day scored; this time George C. Pimentel, who received the Award in Petroleum Chemistry sponsored by the Precision Scientific Company. Pimentel, now Professor at Berkeley, was cited "for development of the matrix isolation technique for studying free radicals."

(Chem. Engr. News) --- --- ---

The aspersions cast in foregoing paragraphs on the undergraduate instruction of more recent years should not be too broadly generalized. These criticisms apply to undergraduate morale and to laboratory training, not chemical theory. Courses of the present day at UCLA are distinctly more modern — for their day and age — and closer to the forefront of current research than the courses of the twenties and thirties. Even the laboratory program has had a boost, due to postwar prosperity, in the substitution of standard-taper glassware and other modern laboratory equipment for the old cork-and-rubber outfits that one must still use in the mass-education, nonmajor courses. Unquestionably the accelerated research tempo,
and the frequent arrivals of new young staff members from various important training centers, have a strong influence in raising the standards of lecture courses.

An example of the upgrading of lecture courses is seen in the theoretical part of the new Chem. 112A-112B sequence. First designed as a special year course in organic chemistry for chemistry majors, the program is now attracting the attention of the more scholarly premedical and biological majors, to say nothing of the increasing proportion of chemically-minded faculty members in those outside departments.

Addition of a third elementary organic program has led members of the staff to wonder whether the department really needs two courses (8, 9 and 10), both for beginners in organic chemistry and both of lighter weight than the 10-unit 112A-112B. It would not be surprising in the near future to see all of the less rigorous work (such as that presently listed as Chemistry 10) in organic chemistry consolidated into the one Chemistry 8, 9 program.

To accomplish this without hardship to other departments, it may be necessary to offer a short-course and long-course laboratory option under course 9. Or perhaps the Los Angeles department may at last abandon the exceptional and unorthodox separate lecture and laboratory course plan inherited from Berkeley in 1930, and — as in Harvard
Illinois and numerous other major institutions — offer one indivisible lecture-and-laboratory course, either for chemistry or non-chemistry majors, as the case may be, just as Chemistry 1A is offered to freshmen without permission to take lectures only. The building planning committee should have advance knowledge of any such plan, however!
CHAPTER 18

POSTGRADUATE STUDY

Shortly before World War II the Chemistry Department was officially authorized to conduct graduate study for the Ph.D. degree. To be sure, there had already been received dissertations for the master's degree that were fully equal to a normal doctor's dissertation elsewhere on all counts with exception of length.

There now ensued a period of transfer of interest to the graduate school, and an apparent curtailment of the individual faculty teaching load. But this meant no easing off or relaxation of effort by staff members. It is pleasing to note that State authority is coming to realize that the direction of graduate research in a real university is, or should be, a very large part of the so-called teaching load; and that the mere number of hours of contact with ordinary classes has no significant relation to the real burden being shouldered by the faculty member. The result of the new attack at higher scholastic level is seen in a recent report on scholarly publications in recognized scientific journals:
Publications from Members of the UCLA Chemistry Staff

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896 - 1932</td>
<td>82</td>
</tr>
<tr>
<td>1933 - 1937</td>
<td>65</td>
</tr>
<tr>
<td>1938 - 1940</td>
<td>78</td>
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<td>1941 - 1942</td>
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<td>1953 - 1954</td>
<td>105</td>
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<tr>
<td>1955 - 1956</td>
<td>127</td>
</tr>
<tr>
<td>1957 - 1958</td>
<td>137</td>
</tr>
</tbody>
</table>

As already explained briefly at the beginning of this historical narrative, it is not practical to abstract the hundreds of papers cited above, nor the thousands of pages of doctors' and masters' dissertations already on the chemistry library shelves. Accordingly, no attempt will be made here to comment systematically on the programs of the respective staff members beyond the brief statements given in connection with the academic biographies and record of appointments. One exception is made—we hope justifiably—namely the history of many years past leading up to the outstanding development of physical organic chemistry at UCLA. The situation might be likened to that at Berkeley thirty or forty years ago, when a department historian would unquestionably have taken special pains to describe the establishment of G. N. Lewis' world center of chemical thermodynamics.

Undoubtedly the one most conspicuous and widely-recognized phase of research scholarship credited to the
UCLA chemistry department has been that phase, or division of organic chemistry known more or less accurately as "physical organic," "mechanistic," or sometimes just "modern organic" chemistry. In this field the local group has achieved international fame. For the benefit of possible non-chemist readers of these lines, a short review of past trends in organic chemistry may throw light on the Los Angeles accomplishments.

For most of the past century Germany was the unquestioned world leader in organic chemistry — no near competitor in quantity of good work done. The science consisted of inventing new chemical reactions, discovering or creating new compounds, establishing their (classical) structural formulas and preparing analytical proof of laboratory success. Germany in particular became the great breeding farm of organic compounds. By the time UCLA was well established the world tally of known organic compounds was approaching a half million. In the English-speaking world, however, a few scholars decided to "quit raising guinea pigs" and to place organic chemistry on foundations that were more fundamental and in their opinion more worthy of a physical science.

Inspired by such fundamental thinkers as J. J. Thomson, Rutherford and Soddy, quickly followed in America by G. N. Lewis, a group of British chemists took the lead,
as seen in the theoretical findings of Lapworth, Robinson, Lowry and Ingold. These workers started the scholarly fashion of blaming electrons for special behavior of organic compounds. American chemists have joined the campaign with so much enthusiasm that the old-fashioned guinea-pig organic chemistry no longer seems to attract the graduate student.

Returning to southern California, the present chronicler suspects that our pioneer in "modern" organic chemistry, Lucas of the California Institute, not only had absorbed some of the spirit of the British pioneers, but also had been prepared for such theories during his short period of advanced studies in the laboratories of two other pioneers, Nef and Stieglitz of Chicago. Actually Nef and Stieglitz were both very much mechanistically inclined, though not even in agreement with each other. They lived in too early a period to place their interpretations on solid foundations. The electronic molecular structures to be developed by G. N. Lewis were not at hand.

During the present writer's graduate student days under Stieglitz, the students used to urge the old master to put his advanced theories into book form. They never succeeded. Stieglitz must have realized the weak theoretical foundations of the period, and felt that his pro-
posals were not thoroughly convincing. Accordingly, he was content to throw his ideas out orally in the advanced lecture course, and not pin us down too pointedly in the examinations!

With Lucas now at the California Institute, it was only to be expected that another pupil of Stieglitz, J. H. C. Smith, should inspire his former star student of Colorado College days, namely William G. Young, to enter candidacy for the doctorate at Pasadena. To continue the story, it was natural that Young as a new faculty member at UCLA should in turn send his own leading student, already with the bachelor's and master's degrees, Saul Weinstein, to Pasadena for another thesis with Lucas. Weinstein in turn sponsored Ernest Grunwald, where the present academic genealogy comes to a conclusion.

Correction: We should probably say, comes to the most recent milestone on record!

Having figured out the ultramodern portion of this genealogy, we indulge in the indoor sport occasionally practiced by professional chemical historians, and try to trace the succession of teacher and pupil back to the days of alchemy. We thus enlist the aid of a specialist in the history of chemistry, Dr. Virginia Bartow of the University of Illinois. Dr. Bartow comes by her historic memories naturally. Her late father, Edward Bartow, was
well known not only as president of the American Chemical
Society, but also as the "grand old man" of the chemistry
department of the State University of Iowa.

With Dr. V. Bartow's aid, it is now convenient to
fill in the earlier part of the chemical genealogy point-
ing to UCLA. In the following list each famous chemist
was the teacher, or director who presided over advanced
studies of the student mentioned in the next entry. Each
student, in turn, becomes a teacher or director, and pre-
sides over the work of the next young man below.

Genealogy

Bernard Palissy, 1510–1589, ceramic investigator and
scientific writer of wide fame; author of Des Terres d'Ar-
gile.

Jean Beguin, 1570–1620, Paris; author of a manual of
experiments, written in Latin.

Theodore de Mayerne, 1573–1655, Paris; medicinal
chemist; later went to England, became royal physician.

W. Davison (sometimes written Davison), 1593–1669,
Paris; a Scot from Aberdeenshire; Professor in Jardin
des Plantes.

Christophle Glaser, 1600–1670, native of Basle,
apothecary to the (French) king, and professor in Jardin
du Roi, Paris.

N. Le Febre, 1610–1674, author, professor in Jardin
du Roi, Paris.

Nicholas Lemery, 1645-1715, Paris; pharmacist, textbook author.

Wilhelm Homberg, 1652-1731, Paris; discoverer of boric acid.

E. F. Geoffroy, 1672-1731, Paris; College de France; studies on affinities of acids and bases. Contender against alchemical frauds.

C. L. Bourdelain, 1696-1751, Paris; chemical theorist and lecturer, non-laboratory worker, who used Rouelle (see below) as "demonstrator." College de France.

C. F. Rouelle, 1703-1770, Paris; lecture demonstrator; discovered urea and hydrogen sulfide.

P. J. Macquer, 1718-1784, Paris; Jardin des Plantes. Considered at the time as the discoverer of the reaction:

\[ \text{H}_2 + \text{air} \rightarrow \text{water} \]

Augustin Roux, 1726-1776, Paris; specialist in medicinal chemistry; editor of *Journal de medicine*.

J. B. M. Bucquet, 1746-1780, professor of chemistry at the Medical School, Paris.

C. L. Berthollet, 1748-1822, Ecole Normale, Paris; inorganic chemist; discovered chlorine hydrate and cyanogen chloride.


Justus von Liebig, 1803–1873, Professor in the University of Giessen at age 21; later professor at Munich. The "father of organic chemistry" in Germany.

August W. Hofmann, 1818–1892; earlier years spent at Royal College of Chemistry, London, later at Univ. Berlin. Famous for fundamental studies in dye chemistry, for "Hofmann rearrangement," and "Hofmann degradation."

Ferdinand Tiemann, 1848–1899, Professor of organic chemistry, University of Berlin; researcher in field of camphor, terpenes; discoverer of ionone; cf. Reimer-Tiemann synthesis of aromatic aldehydes. (At this point the genealogy shifts to the United States, since the pupil of Tiemann was a foreign (German-American) graduate student.)

Julius Stieglitz, 1867–1937, University of Chicago; chemical rearrangements, pioneer physical-organic concepts.

Howard J. Lucas, 1885– , Professor of Organic Chemistry, California Institute of Technology; physical-organic theory; author of important textbook and manual.

William G. Young, 1902– , Professor of (organic) chemistry, UCLA, later dean and vice-chancellor; chemistry of unsaturated compounds; physical-organic chemistry.
Saul Winstein, 1912--, Professor of (organic) chemistry, UCLA; physical-organic chemistry; American Chemical Society award, 1948.

Ernest M. Grunwald, 1923--, Professor of chemistry, Florida State University; American Chemical Society award, 1958-9.

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In the foregoing genealogy one can appreciate how the veteran French organic scholar, Charles Adolphe Wurtz, came to write the classic first sentence in the introduction to his History of Chemical Theory—a sentence which so greatly exasperated the German organic chemists:

"La chimie est une science française."

Well now, M. le Professeur, perhaps it WAS, two hundred years ago; but somebody else has been getting the credit lately!

---

Now that a French opinion is on record, perhaps it will be appropriate to set down a German observation; this time a defensive comment which purports to come from an old-fashioned organic chemist who views with misgivings the Anglo-American development in theory of organic chemistry.

Although we are unable to trace this item back with certainty to its author, legend informs us that Arthur
A. Noyes got it from Wilhelm Ostwald, who may have had tongue in cheek. Noyes passed it on to his enthusiastic young research assistant Charles D. Coryell. In turn, Coryell recited it to his new student group at UCLA. It tickled them so much that one of their number, Pete Heussenstamm, painted the little ditty neatly on a sign. As these lines are written, this sign still looks down philosophically at the conference tables in physical chemistry in the new Chemistry Building:

Nicht so einfach scheint mir die
Physikalische Chemie;
Voll von Dornen ist der Pfad
Eh' man kommt zum Resultat;
Denn es gibt in der Chemie
Körper die die Theorie
Welche sie beweisen sollen
Noch nicht anerkennen wollen.

- Which being very briefly interpreted, says-
"Chemicals don't always recognize the theory they're supposed to prove!"

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In spite of all of the biased observations from distant lands, the scholarly findings of Young and Winstein have led to membership in the National Academy of Sciences, and to numerous invitations, both at home and abroad, to address important scientific conclaves. England, Switzerland and even Germany are represented in these recognitions; latest tribute and invitation was
from the National Academy of the Soviet Union.

We hasten to add that modern organic chemistry is by no means the private province of these two scholars, even though Young and Winstein were the original promoters. With Jacobs long since a leading national authority on the latest tricks of acetylene, Geissman in a decidedly modern fundamental study of naturally-occurring compounds, Cram in a brilliant, highly imaginative attack on stereochemical problems, and new researches by the younger staff members Hendrickson and Conrow, there results a comprehensive fellowship in modern organic chemistry attractive to visitors from afar. But none of these UCLA researchers is running a guinea-pig farm!

A few details of this well-rounded program of organic projects, and of other divisions of chemistry, are found in the brief biographical statements earlier in this volume, and are suggested more extensively in Chapters 24 and 25, Doctors' and Masters' Degrees.

Conclusion of the Historical Period, 1879-1959

Wednesday afternoon, May 27, 1959, the Chemistry Department assembled for coffee and cakes, and then on the southwest steps of the Chemistry Building for an anniversary photograph, copy of which appears at the end of this chapter. This event occurred just forty years
and three days after Governor William D. Stephens signed the bill creating the Southern Branch of the University of California. The picture includes faculty, postdoctoral fellows, graduate students, research assistants and non-academic staff.

Following the performances of coffee staff and University Photographer Harry Williams, the group assembled in Room 2224 to hear an address by the retiring Chairman, J. B. Ramsey, on the topic— "The Education of a Chemist at UCLA — An Appraisal." And, we hasten to observe, this was not an elaboration of the technical study requirements such as might come from the ACS Committee on Professional Training of Chemists, much as we respect and commend the work of that body.

Particular emphasis was laid by the speaker on the theme — one might say almost hackneyed theme — that the student should have more and better training in English. But Professor Ramsey does not pretend that we can solve this problem summarily by the mere requirement of a
course in English composition, or as in more recent years, two courses, freshman and upper-division. Both academic and industrial employers are now strongly advising the replacement of a significant amount of technical courses by liberal arts in the training of real leaders. While Ramsey mentioned no names, he undoubtedly realized, as the present writer does, that there is always a strong sentiment in this Department for packing more technical courses, not less, into the four-year term of the undergraduate.

For example, one naturally asks what takes the place of the deleted third semester in Kenneth Trueblood's Chemistry 3A-3B sequence, which for gifted students replaces Chemistry 1A-1B-5A. To some staff members — not Ramsey — this just means more physical science or technology. On the other hand, it should NOT mean, as has been claimed, merely a chance to fill in a "cinch" course in which the prospective chemist has no real interest nor intent to do real work, so that time will be clear for physical science.

Without attempt to abstract all of Ramsey's comprehensive address, this brief review is concluded with a little "underlining" of the Chairman's remarks on overdoing of the lecture part of chemical education. The speaker favored a sharp reduction in time spent in
lectures. This advice recalls the much more extreme views of the late Gilbert N. Lewis, who would not even allow a graduate lecture course in his distinguished department at Berkeley.

All of this reminds one of the educational research of many years ago which started primarily with an appraisal of the relative merits of the recitation and the lecture as modes of instruction. It was conceded that the lecture was better than the recitation for mature students. This would be particularly applicable to upper division chemistry majors. That was almost obvious. Better than either, however, was the lecture-discussion method, in which both students and instructor talked intermittently through the whole class hour. This is actually harder work for the instructor, since the plan requires close watching and forceful, skilled guidance to prevent degeneration into trifling conversation. But perhaps this is the answer to Ramsey's pointed criticism.

- - - -

Now that Ramsey's address had passed into history, only five weeks of this chronology remained before the deadline of the volume, June 30, 1959. At this point we may summarize, with extreme abbreviation, the eighty years of existence of the institution first called "Branch Normal School," then "Los Angeles Normal School,"
"UC Southern Branch," and finally "UCLA", with reference to six milestones, three fiscal and three personal:

1. In the late spring of 1879, public sentiment crystallized in Los Angeles for the establishment of an institution of higher education, which shortly appeared on a budget of no less than $58,000 for land and building.

2. In the same late spring of 1879, in far away Massachusetts there occurred the apparently unrelated incident of the birth of William R. Crowell. Forty years now pass:

3. In the late spring of 1919 the University of California took over the educational properties of this same Los Angeles institution, which it sold not long thereafter for $2,500,000. Factor of increase (with a little extra for good measure), about forty times.

4. A few weeks after the acquisition cited as Item 3 above, the University awarded the first appointment of a faculty member in the new Department of Chemistry to William R. Crowell. Forty more years now pass:

5. In the late spring of 1959 it was reported in the Office of Architects and Engineers, UCLA, that the University had now invested, in lands and buildings, the tidy sum of $108,000,000. Factor of increase for the
second forty years (with a little extra for good measure) about forty times.

6. In the late spring of that same year, 1959, William R. Crowell is busy in his laboratory in Room 2037 Chemistry Building with research in analytical chemistry. No, not old-fashioned quantitative analysis, but ultra-modern electrometric instrumental analysis!

And here are the five veterans of Southern Branch days as they looked in the summer of 1959:

Left to right, in order of age—

William R. Crowell, appt. 1919.  
G. Ross Robertson, 1921.  
James B. Ramsey, 1923.  
Hosmer W. Stone, 1921.  
Max S. Dunn, 1922.
| 1  | Atkinson, D. R.                  | 31 | Chakravarty, D. N.                  | 61 | Singer, Lawrence                      |
| 2  | Cram, D. J.                     | 32 | Parker, Barbara                     | 62 | Dalton, David                          |
| 3  | Garnet, C. S.                   | 33 | Murphy, Ed                          | 63 | Sleger, Paul                           |
| 4  | Crowell, W. R.                  | 34 | Oono, Atsuko                        | 64 | Theander, Olaf                         |
| 6  | Ramsey, J. B.                   | 36 | Brown, Evelyn                       | 66 | Ellestad, George                      |
| 7  | Young, W. G.                    | 37 | Lamb, Sandra I.                     | 67 | Neiman, Robert. R.                     |
| 8  | Blacet, J. E.                   | 38 | Baumik, Manilal                     | 68 | Silva, Ricardo                         |
| 9  | Geissman, T. A.                 | 39 | Crowe, Thomas                       | 69 | Sonnenberg, Joseph                     |
| 10 | Scott, R. L.                    | 40 | Barbarin, Robert                    | 70 | Olson, Thomas                          |
| 11 | Weinstein, S.                   | 41 | Scott, E. A.                        | 71 | Crabbs, Glen                          |
| 12 | Smith, R. A.                    | 42 | Chandorkar, K. R.                   | 72 | Grissom, James                        |
| 13 | Stone, H. W.                    | 43 | Pegilotti, J. I.                    | 73 | Collins, George                       |
| 14 | Pessok, R. L.                   | 44 | Appleman, David (Agr)               | 74 | Smithson, Luther                      |
| 15 | McCullough, J. D.               | 45 | Porter, Lee                         | 75 | Duffy, M.                             |
| 16 | West, C. A.                     | 46 | Thompson, David T.                  | 76 | Kopecky, Karl R.                      |
| 17 | James, R. A.                    | 47 | Williamson, Arthur G.               | 77 | Lieberman, Martin                     |
| 18 | Gough, T.                       | 48 | Dalton, Cecile K.                   | 78 | Murahige, Robert                      |
| 19 | Zimmermann, I. C.               | 49 | Schaefer, William                   | 79 | Green, Stanley                        |
| 20 | Burke, Mary                      | 50 | Lewis, Sheldon                      | 80 | Dunlevy, E. S.                        |
| 21 | Gantzel, Peter                  | 51 | McDonald, David J.                  | 81 | Holmes, John                          |
| 22 | Wilcox, Robert                  | 52 | Bogard, Terry                       | 82 | Gilmour, John                         |
| 23 | Schuster, F.                    | 53 | Leitz, Fred                         | 83 | Offen, Henry, I.                      |
| 24 | Gagneux, Andre R.               | 54 | Shimokoriyama, Marami               | 84 | Speer, Donald                         |
| 25 | Holzer, Margaret                | 55 | Mason, James                        | 85 | Allred, Evan                          |
| 26 | Zuccaro, David                  | 56 | Meeker, Robert                      | 86 | Ordromoeau, Charles                   |
| 27 | Williamson, Mrs. A.             | 57 | Beers, Virginia                     | 87 | Alley, Stanley                        |
| 28 | Hansen, Robert                  | 58 | Fowler, Audrey                      | 88 | Anderson, Curtis                      |
| 29 | Stanfield, M. K.                | 59 | Friedrich, Edwin                    | 89 | Call, John                            |
| 30 | Karasek, Donna                  | 60 | Rowe, John                          | 90 | Piccolini, Richard                    |
| 91 | Poulsen, Mrs. K. G.             | 92 | Bauer, H. Fred                      | 93 | Smith, Stanley                        |
| 94 | Wilson, R.                      | 95 | Poulsen, K. G.                      | 96 | Becker, Fredrick                      |
| 97 | Feldman, Martin                 | 98 | Isom, Francis                       | 99 | Strasburger, R.                       |
| 100 | Sanberg, A. H.                  | 101 | Buckley, M.                         | 102 | Hedaya, Eddie                         |
| 103 | Stern, Adele                    | 104 | Jensen, K. K.                       | 105 | Vogelfanger, Elliot                   |
| 106 | Spanger, Robert                 | 107 | Harbridge, Mike                     | 108 | Trueblood, K. N.                      |
| 109 | Fisher, B.                      | 110 | Aldridge, Fred                      | 111 | Fehrmann, Klaus                       |
| 112 | Pertel, Richard                 | 113 | Comrow, Kenneth                     | 114 | Simonatis, Ronald                     |
| 115 | Myers, Donald                   | 116 | Round, Kenneth                      | 117 | Wais, A. C.                           |
| 118 | Carlson, Doris                  | 119 | Chang, James                        | 120 | Robertson, G. R.                      |
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CHAPTER 19

SPECIAL APPOINTMENTS TO CHEMISTRY STAFF

During recent years the Chemistry Department has had the practice of inviting young scholars for temporary teaching positions. Some of these appointees were substitutes for regular staff members absent on special projects off campus. In other cases the appointment might have been entitled as a postdoctoral educational fellowship, suggestive of similar practice in the chemistry department at Harvard University, for example. Only in exceptional cases does the holder of the "fellowship" remain as a permanent staff member.

This chapter is devoted principally to biographic data, in alphabetical order, on these junior appointments. One additional item of different nature is included, covering the temporary sojourn of the chairman of the department of physiological chemistry, School of Medicine, in the new Chemistry Building of 1953.

Irving S(wem) Bengeldorf, instructor 1952-54, received the Ph.D. degree at the University of Chicago in 1951. His thesis dealt with the chemistry of phosphorous
esters, directed by Professor Morris S. Kharasch. Following a year as research assistant to Professor Pauling at Pasadena, Bengelsdorf accepted the temporary instructor-ship in organic chemistry at UCLA, and then went into the employ of the General Electric Company at Schenectady. Bengelsdorf had made a special study of the Russian language, and assisted many persons, during his stay in Los Angeles, in getting a start in scientific Russian.

Joseph G. Bower, A.B. Univ. Colorado 1950, Ph.D. UCLA 1956, served as instructor for the academic year 1956-57. He was in charge of sections of Chemistry 5A, elementary quantitative analysis.


Frank Lewis Lambert, native of Minnesota, Ph.D. University of Chicago 1942. Served as member of the
the staff of Edwal Laboratories in Chicago, 1942-47. Instructor in chemistry at UCLA, 1947-48; now a member of the faculty at Occidental College. Special interest, molecular models.

Edward Leete, B.Sc. 1948, and Ph.D. 1950, University of Leeds, England; thesis in Colour Chemistry, directed by Wm. Bradley. During 1950-54 Leete was postdoctoral research fellow collaborating with Leo Marion in the Ottawa laboratories of the National Research Council of Canada. He then came to UCLA, serving for the next four years as instructor and assistant professor. In 1958 he resigned to accept a position as assistant professor of chemistry at the University of Minnesota. Leete's recent research interest has been in the use of radicisotopes in determination of the course of biosynthesis of alkaloids, including nicotine and morphine.

Richard E(ward) Marsh, B.S. Calif. Institute of Technology 1943, Ph.D. UCLA 1950. Instructor in chemistry for one semester, January to June 1953 during the absence of C. A. West in military service.

Allen L(yle) McCloskey, A.B. Whittier College 1940, Ph.D. Univ. Wisconsin 1951; thesis directed by Wm. Johnson in the field of steroids. He served as instructor for the academic year 1951-52, and left to accept a
position with the chemistry department at the University of Pennsylvania.


Robert W(atson) Richardson, native of California, B.S. Stanford University 1949. Graduate study under Rollefson at the University of California, Berkeley in the field of photochemistry of aliphatic chlorine compounds, with particular attention to the kinetics of the reactions involved. Served as instructor at UCLA, 1953-55, in charge of freshman laboratory work.


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H. Darwin Kirschman, Ph.D. California Institute '29, served at different times as associate, lecturer and instructor in chemistry in the UCLA department. Kirschman is an inorganic chemist, with extensive business experience both in Hawaii and California. During the earlier years of his service to UCLA, he had as colleague in similar activities Richard Dr Pomeroy, also Ph.D. from
the California Institute (1931). Pomeroy is now a consulting chemist with particular interest in water and sewage problems.

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In the classification of "visiting" rather than temporary personnel was Professor W. H. Griffith, Chairman of the Department of Physiological Chemistry in the local School of Medicine. Appointed to his present post in 1951, long before completion of the permanent laboratories of his department, Professor Griffith was a "roomer" in our new Chemistry Building.

Wendell H( orace) Griffith, native of Iowa, B.S. Greenville College, Ill., is a Ph.D. from the University of Illinois. He has held academic positions of prominence in Missouri and Texas, with concurrent projects of note in connection with federal agencies. Although Professor Griffith has long occupied the splendid new laboratories of physiological chemistry in the local Medical Center, the Chemistry Department remembers with pleasure his stay as a roomer, and has elected him as a special extramural member of our own instructional staff.
CHAPTER 20

NON-ACADEMIC STAFF

From 1929 to date of retirement in 1956, Leon E. Robinson (picture on page 180) served first as lone storekeeper, and later as buyer for the chemistry department. Some years before his retirement date, Robinson was provided with an assistant in the person of A. H. Sanberg, as research needs developed and storeroom duties multiplied.

Albert H(enry) Sanberg, native of Pennsylvania, served in various capacities with the American Electric Power Company of New York, and later in factory control and personnel relations served the Pittsburgh-Corning Corporation. Following his local storeroom experience, he became department business manager.

When World War II was at last out of the way, a great need for technical service in electronics developed at UCLA. The answer to this problem was Karl Jensen.
Karl K(nud) Jensen, native of Duluth, Minn. counts his years of experience as approximately coincident with the period of radio broadcast. Even as far back as 1920 he dabbled as a youngster extensively in "wireless" matters. In 1925 he was a radio broadcast operator, and in 1928 a radio test designing engineer. By 1939 he was deep in sound recording (Hollywood), 1931 as radio-receiver design engineer for Stewart-Warner and 1941 in radio and radar testing for Lockheed. In 1947 he became electronics technician for the Chemistry Department.

Early attention was paid to the machine-shop problem. Although no special chemistry shop was available until 1952, an addition to staff was made in 1950 in the person of Frank Schuster, whose likeness appears below.
Frank Schuster, native of Siegen, Westphalia, Germany, did his term in thorough, old-fashioned style as apprentice in Germany, 1920-24. Two years of machine-shop practice in his native country followed.

After emigration to the United States, Schuster engaged in the development of sound cameras in Hollywood, 1928-30. From 1930 to 1936 he was in tool and die practice, and served the Marchant company from 1936 to 1946. The years 1946 to 1950 found him with the Carnegie Institution of Washington, Stanford laboratory. In 1950 he came to UCLA, and now seems to be exactly where he really enjoys himself - some new puzzling problem every hour.

**Storeroom and Solution Service**

John Hanson  L. E. Robinson  Wm. Hanson
Thanks to the unique organization of storeroom service in the local department, special attention has been directed to the combined role of freshman storeroom manager and "solution maker." The first master of ceremonies in this somewhat complex role was George Fielding, who served in the old chemistry building, now Haines Hall. Three of the principal successors to Fielding were John Hanson (now with the Standard Oil Company of California in San Francisco), his brother W. J. Hanson (Dow Chemical Co., Calif., polymer technology) and Joseph M. Rule (du Pont Company, Wilmington).

Following the move to the new building, the solutions-freshman storeroom job was held by Richard B (ruce) Gillespie, native of Minnesota. Gillespie was also part-time student, and took his B.S. (1952) in physics at UCLA. In 1959 he attained the M.S. in chemistry. Before this he had already "bequeathed" his job to Michael Duffy, and is now instrument technician for the Department.

The marked growth in organic chemistry soon led to the need for a full-time organic microanalyst. In the United States, however, such an analyst is hard to find. We therefore went to England.
Miss Heather King was trained as analyst at Imperial College, South Kensington, London in 1942. More or less simultaneous was her experience with Glaxo Laboratories, Ltd., particularly in the practice of microcombustion analysis, and during the industrial development of vitamin $B_{12}$ and cortisone. After considerable negotiation with State and Federal governmental authority, approval was obtained for transfer of Miss King to the UCLA chemistry department in 1953.

Ellen S(arah) Dunlevy, department secretary, is a native of Vermont. After moving to southern California, Miss Dunlevy attended Marymount College, west Los Angeles, majoring in journalism. In addition to business-office experience she has served as instructor or in swimming both in her native
state and in California. As department secretary Miss Dunlevy primarily assists the department chairman, and as of July 1, 1959, also assists the new vice-chairman, Dr. E. R. Hardwick.

Michael Duffy, B.S. Shurtleff College (Illinois) was employed by the General Chemical Company in East St. Louis, 1937 to 1955. He then took over the duties in the freshman storeroom and solutions department, succeeding Richard Gillespie.

A notable development of recent years dates from the arrival of E. L. Wheeler in 1945 to install a new glass shop.
Edgar L(ouis) Wheeler, native of Tacoma, Wash. found his first major employment with the Shell Development Co. in Emeryville, Calif., 1932-1941. At first a pilot-plant operator, Wheeler later turned to glassblowing. From 1941 to 1944 he served as departmental glassblower at the Johns Hopkins University, and then shifted to Oak Ridge, Tenn. for the last war year. He was then appointed as the first glassblower at UCLA, where he serves other departments, some off campus, as well as the chemistry department. An outstanding achievement credited to Wheeler is his publication *Scientific Glassblowing* (1956) described in the chapter on department books. The author of this work has developed special skill in design and construction of precision fractionating columns.

In service as chief storekeeper and laboratory supplies buyer is Fredrick Becker, native of Russia but of German ancestry. For many years Becker was active in grand opera music, in which he was singer (basso cantante) in the American outpost of the famous La Scala enterprise. He sang many roles as colleague of such artists as
Tito Schipa and Martinelli. A serious affliction in vision, aggravated by the intense illumination of theatrical scenes, at last compelled Becker to abandon an interesting lifework in music. During World War II he was a member of the U.S. Naval Reserve.

James Marvin Grissom, Lecture-demonstration assistant, is a native of Detroit, where he attended Wayne University. During World War II Grissom was with the Procurement Division of the U.S. Air Force at the Willow Run Bomber plant. After coming to California he had considerable experience with Consolidated and North American aircraft industries and took over his present duties in 1951.

Additional non-academic employees of the Chemistry Department, as of July 1, 1959, are listed below. As a striking comparison — or should we say contrast — a complete list is presented here for each of the two dates, July 1, 1929, when UCLA as a whole moved to the Westwood Hills campus, and July 1, 1959. Both academic and non-academic personnel are recorded here, full-time staff only:—
Chemistry Department, July 1929

Academic Staff:

Morgan, William Conger, organic chemistry, Chairman.
Crowell, William R., analytical chemistry.
Stone, Hosmer W., inorganic chemistry.
Robertson, G. Ross, organic chemistry.
Dunn, Max S., biochemistry.
Ramsey, James E., inorganic-physical chemistry.

Non-academic staff:

Robinson, Leon E., storekeeper.

The Department thirty years later, July, 1959

Academic Staff:

Blacet, Francis E., photochemistry; divisional dean of physical sciences.
Gher, Mark, physical chemistry.
Conrow, Kenneth, organic chemistry.
Cram, Donald J., organic chemistry.
Crowell, William R., analytical, emeritus.
Drinkard, William C., inorganic chemistry.
Dunn, Max S., biochemistry; associate dean of the graduate division.
Farrington, Paul S., analytical chemistry.
Garner, Clifford S., inorganic-nuclear chemistry.
Geissman, Theodore A., organic chemistry.
Hardwick, E. Russell, physical chemistry; vice-chairman.
Hendrickson, James E., organic chemistry.
Jacobs, Thomas L., organic chemistry.
King, Miss Heather, associate research chemist in charge of organic analytical services.
Kivelson, Daniel, physical chemistry; undergraduate departmental adviser.
Libby, Willard F., nuclear chemistry.
McCullough, James D., physical chemistry; graduate adviser.
McMillan, William G., physical chemistry; Department Chairman.
Peasok, Robert L., analytical chemistry.
Ramsey, James B., physical chemistry; emeritus.
Robertson, G. Ross, organic chemistry and director of laboratories; emeritus.
Scott, Robert L., physical chemistry.
Smith, Roberts A., biochemistry.
Stone, Rosmer W., inorganic chemistry.
Trueblood, Kenneth N., physical chemistry.
West, Charles A., biochemistry.
Winstein, Saul, organic chemistry.
Young, William G., organic chemistry; Vice-Chancellor (in charge of building and campus development)

Non-Academic Staff:

(Titles are not always the official University employment designations, since the latter do not always show the particular function of the person involved.)

Office Staff:

Sanberg, A. Henry, business manager of the chemistry department.
Dunlevy, Miss Ellen S., Dept. & Chairman's secretary.
Hankey, Miss Marilyn, secretary to business manager of the department.
Noble, Mrs. Margaret, department accountant.
Alderson, Mrs. Patricia, secretary, biochemistry group.
Reed, Mrs. Ruth M., secretary, room 2048.
Basinet, Mrs. Alice, secretary-stenographer to the graduate adviser.
Carlson, Miss Doris, secretary-stenographer, room 4332.
Cummins, Miss Susan, secretary-stenographer to the undergraduate adviser.
Klein, Miss Sandra, secretary-stenographer.
Stern, Mrs. Adele, stenographer, receptionist.

(Library - not administered by Chemistry; in charge of Mrs. Eve A. Dolbee and assts.)

Electronics:

Jensen, Karl K., technician in charge.
Fisher, Byron, assistant technician.
Glass Shop:
Wheeler, Edgar L., glassblower in charge.
Strasburger, Robt. R., glassblower.
Buckley, Monroe L., glassblower.

Instruments:
Gillespie, Richard B., technician in charge.
Karasek, Miss Donna M., analyst.

Machine Shop:
Schuster, Frank, mechanic in charge.
Gough, Thomas H., mechanic.
Sater, Ross, mechanic.

Laboratory Technicians, general
Brown, Mrs. Lynn, biochemistry.
Burrow, Mrs. Donna, biochemistry.
Fowler, Miss Audrey, biochemistry.
Morris, John, animal caretaker.

Lecture Demonstration:
Grissom, James M.

Storeroom Service:
Becker, Fredrick, in charge.
Harbridge, W. B., research storekeeper.
Isom, Francis, assistant res. storekeeper.
Round, Kenneth, receiving storekeeper.
Starratt, John, research storekeeper.
Wilson, Richard H., storekeeper in charge of sophomore-junior-senior course service.

Solutions Department:
Duffy, Michael, solution maker; also in charge of freshman storeroom service.
CHAPTER 21

BOOKS BY STAFF MEMBERS

Several textbooks in chemistry have come from the Chemistry Department. First in order of curricular level of advancement are four editions of the work first called Experiments in General Chemistry, later Experiments, Theories and Problems in General Chemistry (McGraw-Hill Book Company). The first edition was by Stone and Dunn, second and third by Stone, Dunn and McCullough, and fourth by Stone and McCullough. Judging by the pictures, the results have been pleasing, we conclude.

(Likenesses of more youthful days in earlier chapters.)
This work was originally designed to put "teeth" into freshman laboratory work, which in past decades has been open to excessive copying and evasion of actual personal performance at the bench. Answers to questions were too obvious. In the newer experiments a large number call for analytical determinations, qualitative or quantitative, which cannot be copied out of a textbook. These authors have thoroughly rid freshman chemistry of the stigma of "glorified high-school chemistry" which it had when the present writer was a freshman himself.

**Laboratory Practice of Organic Chemistry.**

by G. Ross Robertson (three editions, Macmillan) is a combined text and laboratory manual for the one-year undergraduate laboratory course. Manuals of this type have usually been confined almost wholly to practical directions for general operations and specific organic syntheses. Unsympathetic physical chemists call them "cookbooks." The unique feature in *Laboratory Practice* is an unusually extensive but informal treatment of the physico-chemical principles underlying laboratory manipulation, without attempt to cover any large amount of conventional "organic theory" or descriptive organic chemistry.
The new textbook *Principles of Organic Chemistry* by T. A. Geissman (W. H. Freeman 1959) bears a title which one would have hesitated to use forty years ago, when some people said that there weren't enough principles known in that branch of the science to fill up a good-sized book. But conditions have changed.

Geissman's volume is designed for general use in a year course in college organic chemistry. It is not designed for chemistry majors alone. Theoretical concepts are presented as an integral part of the description of the behavior of organic compounds. Chemical reactions then become illustrative examples of these principles. Functional groups and general types of organic reactions, with emphasis on the unifying principles binding apparently diverse kinds of reactions together – such are considered more important than the mass of general information that constituted an organic text of the nineteenth century and even of recent years.

Consistent with the policy of writing a book for life science students as well as chemists, Geissman has introduced many examples of naturally-occurring compounds, with attention to materials from plant sources, in which the author has had a long-time interest.
Contemporaneous with the Geissman text is the work by Cram and Hammond entitled *Organic Chemistry* (McGraw-Hill 1959). The co-author, George S. Hammond, is a former postdoctoral fellow of the UCLA department, and is now professor of chemistry at the California Institute of Technology.

As expressed by the publisher, "For the first time, a beginning text departs from the traditional treatment of organic chemistry based on an organization of subject matter according to classes of compounds." It must not be forgotten, of course, that the two textbooks from UCLA appeared within a few weeks of each other, and either publisher may be excused for ignoring the other!

Instead of the conventional sequence of "alkanes-alkenes-alkynes-alcohols-aldehydes" etc., there is first presented a detailed development of relationships based on structure. This includes electronic structures, recognition of functional groups, nomenclature and stereochemistry all presented at an early stage. Not until then comes the organization of reactions into fundamental classes. The earlier topics are not dropped, but are repeatedly reviewed in new contexts. Thus enter the newer features of reaction mechanism, spectroscopic phenomena, acid-base theory etc. Like Geissman's work, the
Cram-Hammond volume is a far cry from the old-time "preparation, properties and reactions." Probably it represents a more radical change from the classical literature than the Geissman text, and thus may puzzle the "old-timer" teacher somewhat more.

"Experiments in Biochemistry" by Max S. Dunn (McGraw-Hill 1951) represented a serious attempt to make vital the elementary experimental program in this field, which had been afflicted with a mass of trivial, poorly-understood laboratory tests. This manual calls for serious projects which teach real analytical as well as preparative techniques, with minimum emphasis on minor color tests that can be reported by a student without the trouble of performance in the laboratory.

In the field of monographs in chemistry the succession of three editions of a treatise on solubility is of special interest here. The first two of these editions, under the single authorship of Professor Joel H. Hildebrand of the Berkeley department, had long commanded international attention as monograph No. 17 in the Reinhold series.

Shortly after World War II Hildebrand invited Robert L. Scott, now of the local department, to serve
as co-author of the third and (to date) latest edition, under the title *Solubility of Non-Electrolytes*. In this edition (1950) both senior and junior authors made major contributions, resulting in an increase from 203 to 488 pages. One special feature of the new edition is the section on high-polymer solutions. In addition there is a great extension of the theoretical treatment as well as discussion of new applications.

*Modern Chemistry for the Engineer and Scientist*, edited by G. Ross Robertson (McGraw-Hill 1957) is a compilation of technical addresses by nineteen chemists of national fame who presented their work initially on the Los Angeles campus. A broad field of chemical research is considered. Among the nineteen scholars invited to participate were C. S. Garner, *Isotopic Tracers in Chemistry*, T. A. Geissman, *Chemical Synthesis in Living Organism*, and Saul Weinstein, *Organic Reaction Mechanisms*.

A volume of unique interest is that entitled *Scientific Glassblowing*, by Edgar L. Wheeler, chief of the UCLA chemistry glass shop. This book (Interscience Publishers, 1959) is much more comprehensive than the conventional vestpocket shop manuals of similar name commonly seen in technical libraries. Sections on glass seals, silvering and numerous allied techniques are found
along with the elementary exercises.

The Rare Earth Elements and Their Compounds, by Don M. Yost, Horace Russell Jr. and Clifford S. Garner (Wiley 1947) was published shortly after Dr. Garner had come to the UCLA department. This monograph was intended as a reference for advanced courses of inorganic chemistry and was a notable improvement on the earlier purely descriptive literature with little correlation.

Principles and Practice of Gas Chromatography, edited by Robert L. Peckok, and containing the principal analytical section by the editor as co-author, was published by Wiley in 1959. It is not a research abstract, but rather a treatise to aid the ordinary analytical chemist, not familiar with the new technique, in both understanding and performance. A very extensive bibliography of this rapidly-growing field is given.
CHAPTER 22

CHEMISTRY LIBRARY

Library history in the Department began with the arrival of Max S. Dunn, who promptly became the departmental committee-of-one in the formidable campaign, lasting for many years, to get authorization for a departmental chemistry library. Dunn's activities as faculty committeeman continued for 31 years, after which the more formal committee management, already organized, was taken over by Thomas L. Jacobs.

During the 1919-1929 decade on Vermont Avenue, the critical fire hazard in the barracks building made any proposal for a local departmental library unthinkable. But fire hazard was not the only problem. An inflexible policy of centralization held all books in the general library anyway. Even when the drawings of the new fire-resistant Chemistry Building were on the boards, some high authority in the North spied the word "LIBRARY" on one small room. This label was immediately ousted by administrative ruling, and the department advisers relabeled the offending room in the plans as a "work room". UCLA is by no means the only institution of higher education that has been compelled to fight the centrali-
zation dogma. Unfortunately, certain administrative
efficiency experts simply do not understand the traffic
problem, if so it may be termed, between chemistry re-
search laboratories and library when business is really
in operation. Some of us who have visited the chemistry
plant at the University of Oregon can well extend sym-
pathy to our northern friends.

Thanks to a few hundred dollars annually in budget
appropriations, Dunn was able to arrange for the pur-
chase of important research "archives," including such
items as a complete set of Berichte der deutschen
chemischen Gesellschaft. These volumes of course were
not in the building which burned on January 3, 1929.
Further aid, however, came from the legislative reim-
bursement following the fire. The Department almost
always purchased complete sets of major journals, paying
little attention to monographs which it could not afford,
or to ephemeral texts of the day for undergraduate ref-
ereence. In this sound, long-range policy Dunn had the
backing of Professor Morgan (cf. page 56).

When the Department was established in the new
building of 1929, Dunn at last persuaded authorities to
let him "draw," as it were, a whole collection of refer-
ence works, mostly on his own responsibility, and set
them up in the little 300-square foot room which thus be-
came the departmental library. Shortly afterward Dunn became chairman of the (general) University Library Committee, and at last got sanction for the branch library principle. As the nineteen-thirties passed, two substantial increases in space brought the chemistry library to the (still crowded) 1200-square-foot size. The service of Mr. Warren Everote, now Vice-President of Encyclopedia Brittanica, but at that time advanced student assistant, and Mrs. Eve A. Dolbee, secretary in biochemistry and now Chemistry Librarian, was notable. Finally, with the 1952 building project, space of about 4000 square feet is available, with prospects of substantial addition when Geology Library is housed in the extensive new quarters which it much needs.

As a result of all this enterprise, in which many other staff members assisted Dunn, UCLA has a chemistry library second to none west of the Rockies. In pure chemistry and biochemistry, nearly all of the important fundamental research archives, so to speak, are here, with the exception of Russian literature, of which acquisition is difficult and costly. A major start has nevertheless been made on the Russian problem, as shown in brief statistics below. The above claim as to coverage in pure chemistry involves no inference about textbooks, of which the Department has a good collection
without pretense of completeness.

An interesting feature of the Chemistry Library is the William Conger Morgan Memorial Collection, devoted largely to history of chemistry. It is hoped that some member of the staff will tackle this collection in a program of historical investigation. Perhaps there may be some good way to stimulate chemistry majors to give formal attention to the history of chemistry without real interference with research programs, as has been done in certain institutions farther east. In the Morgan collection are to be found works of many famous chemists of early days, including Humphry Davy, Berzelius, Ostwald, Lavoisier, Mendeleef, Plattner, Moissan, Nernst, Abderhalden, Arrhenius, Dalton, R. Meyer and Chandler.

Remarkable experiences were encountered by certain books in the Chemistry Library before they found what we presume is their final home. Outstanding among these were the vicissitudes suffered by Chemisches Zentralblatt, the long-desired world leader at the time among chemical abstract journals.

After considerable international dickering during the bewildering winter of 1939-40, the acquisitions department of Librarian John Goodwin's central organization at UCLA finally, on the 18th of April, 1940, cabled an order to Swets and Zeitlinger, booksellers of
Amsterdam for the Zentralblatt. Apparently the price was about $2,400, rising periodically as the costs of shipment during the "cold war" were mounting. The Netherlands firm duly packed up the seven cases of Zentralblatt volumes, and loaded them into the good ship Damsterdijk, due to sail from Rotterdam harbor May 15, 1940. Alas, on May 10 the Nazi invasion struck Norway, Denmark, Holland, Belgium and France, and the chemical volumes were forgotten in the face of new military problems. Rotterdam was heavily bombed, but Zentralblatt escaped. The Chemistry Department disgustedly turned to other matters, and tried to forget the valuable German abstract journal. And of course we were not at war with the Nazi invader!

But Swets and Zeitlinger had not forgotten. The volumes, in due course of time - plenty of time - were hauled out and gazed at. Did we still want them? Indeed we did, said Goodwin and Dunn. A neutral avenue of transatlantic shipment had been arranged through non-belligerent Portugal, via Lisbon, and the dealers surmised at least that they could ship to "neutral" America in that way. On April 22, 1941, however, the booksellers gave notice to Los Angeles that the Lisbon route was now closed, and here the local file records seem to come to an end. At this point legend, as recalled by the present writer from the days when he could get information from
John Goodwin (now deceased) takes up the tale:

Blocked in Portugal, Swets and Zeitlinger decided to ship via the trans-Siberian railway. The homeless Zentralblatt thus went through Berlin to Moscow. This worked acceptably, since Hitler had not yet struck Russia — as of June 22, 1941. On went the books through Irkutsk to Vladivostok, where they embarked on a freighter for Yokohama, Japan. After reshipment on a trans-Pacific vessel, with still more long delays, Zentralblatt finally reached San Francisco a few weeks before Pearl Harbor. With academic hurrahs, the shipment was welcomed, and now rests placidly in the local Chemistry Library.

Other works had lesser tribulations. The world-famous journal Liebig's Annalen der Chemie, in the rare, clearly readable original print, came from the highly reputable bookseller and good friend of Librarians Goodwin and Powell, Mr. Paul Gottschalk of Berlin (and later, The Hague). The present writer recalls regrets at his inability to call on this excellent Buchhändler in Berlin in 1938, where he was told forebodingly that Gottschalk had been exiled to Holland for the usual reason of that period.

Although the Annalen der Chemie is now much over a century old, the earlier volumes are by no means obsolete.
To organic chemists in particular it is virtually an archive of pure chemistry, describing chemical compounds and reactions that have not yet been applied to practical needs.

The Chemistry Building fire disaster at Cornell University in 1920 involved one particularly regrettable loss, namely, the destruction of the publishers' reserve of unsold back issues of *American Chemical Journal* and *Journal of Physical Chemistry*. The latter periodical for years had been a (nonprofit) private business venture of Professor Wilder D. Bancroft of the Cornell faculty. When the time came for UCLA to look for complete sets of these classics, copies were hard to get. The first of these, already a complete collection of 50 volumes, to date of suspension of publication, we obtained in three-quarter morocco binding, from the estate of Professor J. M. Stillman, pioneer of the Stanford faculty.

Many years passed before the dealers could provide a set of *Journal of Physical Chemistry*. At last the death of the famous British author Joseph William Mellor permitted purchase of that scholar's personal set of the bound volumes. Still another famous original owner, Professor William Albert Noyes (senior) of the University of Illinois, sold to the Department his personal set of *Zeitschrift für physikalische Chemie*.
The story of the local Chemistry Library would be decidedly incomplete without mention of Mrs. Eve A. Dolbee, the only departmental librarian that Chemistry has ever had.

During the early struggles of Professor Max Dunn to create a chemistry library, it was rather obvious that the administration would have been unwilling to employ a librarian. In his own biochemical activities, however, Dunn had employed Mrs. Dolbee as secretary, and generously permitted her to give a substantial part of her time to the library. As the years passed, it became obvious that all of Mrs. Dolbee's time would be needed in the library; and here she has done a fine job.

The Chemistry Librarian, native of Kansas, was educated for the secondary teaching profession in her home state. Following marriage, Mrs. Dolbee moved to southern California. The death of her husband soon led her to seek employment, at first part time, in UCLA, and this long since led to full-time service with various helpers, as now scheduled. The increase in duties of the Librarian has in turn long since compelled Dunn to relinquish Mrs. Dolbee to the University Library organization. Not only Mrs. Dolbee, but also junior helpers, operate the establishment as a regular branch of Librarian Lawrence
Clark Powell's staff.

In her annual report, summer of 1959, Mrs. Dolbee has given interesting information about her establishment:

Number of volumes, 14,681, up 8.5% in the past year.
Current serials, 324, up 8%.

Volumes bound for the Chemistry Library last year, 562.

Part-time assistance required, 4100 hours.
Library open 81 hours per week during the regular University session.

Microcards already on hand, 7051. These are preferred to microfilm for subscriptions to rarer journals not used enough to justify original printed copies here. This classification includes chemical patents.

Russian journals received, 12.
Translations of (other) Russian journals received, 7.

Once more the Chemistry Library has had the pleasure of receiving a Specialty Resins, Inc. donation, which again reminds us of the generosity of Mr. E. A. Lasher, M.S. in chemistry UCLA, research under direction of Dr. William G. Young, 1936.
CHAPTER 23

STUDENT ORGANIZATIONS

Outstanding in the category of student societies, as far as postgraduate professional achievement is concerned, is the (local) Alpha Kappa chapter of Phi Lambda Upsilon, national honor society of chemistry. Organized during the rough years of business depression and creditable hard work, the local chapter has done well.

About 1934 a group of UCLA students of high scholarship rating decided to organize a society which would aspire to acceptance as a chapter of the highly reputable Phi Lambda Upsilon. This group selected one of their number, Saul Winsten, as president, and adopted the Greek-letter designation of "Phi Lambda" with obvious foresight. Dr. Max S. Dunn was chosen as faculty sponsor. By 1935 a formal petition was presented, and on June 22, 1935 the desired charter was issued for the new Alpha Kappa chapter of Phi Lambda Upsilon.

Nineteen petitioners had submitted their plea for this national recognition. It is interesting to see, after passage of a quarter of a century, what these petitioners have accomplished in an academic way:
6 Phi Beta Kappa memberships
3 Pi Mu Epsilon (mathematics honor society)
5 Sigma Xi (science honor society)
3 Bachelor's degrees with "Highest Honors," which means that the holders were in the top 3% of their all-University graduating classes
10 Ph.D. in chemistry
5 Faculty positions in major institutions
4 " " junior colleges
2 Memberships in the National Academy of Sciences
2 American Chemical Society ("thousand-dollar") Prizes
1 Nobel Prize in Chemistry

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On the following insert page appears the official Phi Lambda Upsilon charter photograph. In the front row are seen Professor Theophil F. Buehrer of agricultural chemistry, University of Arizona, National Secretary of the fraternity, and Professor Leroy S. Weatherby, organic chemistry, University of Southern California, who brought greetings from a local institution.
CHARTER MEMBERSHIP PHOTOGRAPH - PHI LAMBDA UPSILON

ALPHA KAPPA CHAPTER

(Names, left to right)

FRONT ROW:

Lasher, Nathaniel
Lane, John Fero
Weatherby, Professor Leroy S.
Buehrer, Professor Theophil F.
Dunn, Professor Max S.
Crowell, Professor William R.
Winstein, Saul

MIDDLE ROW:

Lasher, Edward A.
Tierney, Stanley E.
Rittenberg, Sydney O.
Friedman, Melvin
Heldman, Morris J.
Pack, Lloyd C.
Jasaitis, Zene V.

BACK ROW:

Osborne, Darrell W.
Baumbach, Harlan L.
Seaborg, Glenn T.
Roof, Jack G.
Katzin, Leonard I.
Smith, Nathaniel L.
Lauterbach, Richard

Students not shown in the photograph, but who are officially certified by the national officers as charter members in the document of June 22, 1935, include—

Aronow, Albert A., Byron, Ralph L. and McCasland, Gifford E.

During the years subsequent to 1935, the Alpha Kappa Chapter of Phi Lambda Upsilon has sponsored a number of scholarly lectures in memory of Wm. Conger Morgan.
PROFESSIONAL FRATERNITIES

Kappa Gamma Epsilon

In November, 1936 a group of department chemistry majors established a local semi-social, semi-professional fraternity under the designation of Kappa Gamma Epsilon. Like most youngsters, these collegiate chemists did not keep any very elaborate records of their membership or proceedings. With advance apologies for possible omissions, the following list is presented to cover original charter members, plus a few whose enrollment in the group should probably be dated 1937:

Aigner, Herbert L.
Brantley, L. Reed
Brasher, Bert V.
Frampton, Vernon L.
Mchillan, Gilhome W. J.
Morgan, Donald F.
Paris, Oliver L.
Schweiger, Mitchell
Tomlin, James F.

(Robertson, G. Ross, Faculty Sponsor.)

Perhaps the most significant activity of Kappa Gamma Epsilon was its rather philanthropic tutoring service to "lame ducks" in Morgan's rigorously operated courses. Under this plan, numerous worried souls, including many who had cried on the shoulder of the present
writer as fraternity sponsor, were referred to the KGE officer who got them one or two hours of free tutoring. This service cheered the victim a bit, and still better gave him the basis of decision whether he should employ a regular tutor. The more competent of the fraternity tutors thus occasionally got a job. It was quite definitively understood, however, that no obligation to continue was involved in the free coaching appointments. Certainly nobody got rich out of the enterprise. Incidentally this recalls the highly commendable personal attitude, and clean, square dealings of old Kappa Gamma Epsilon. This organization was never characterized as a "get-by" outfit. Maybe they had to work too hard for their rewards!

Apparently no formal group picture of Kappa Gamma Epsilon was taken during earlier years. When the time came to reorganize the local fraternity as a chapter of the national fraternity Alpha Chi Sigma, part of the charter proceedings consisted of the taking of the official photograph which follows herewith. Accordingly, this picture might be labeled "transition stage," as the physical-organic chemists are accustomed to say, between Kappa Gamma Epsilon and Beta Gamma chapter of Alpha Chi Sigma. It thus probably includes a few persons who belong only to the new organization.
LIST OF PERSONNEL; KAPPA GAMMA EPSILON AS CANDIDATE FOR CHARTER AS BETA GAMMA OF ALPHA CHI SIGMA; PICTURE ON PREVIOUS PAGE; LEFT TO RIGHT

FRONT ROW:
Jassitis, Zene V.
Evenson, Raymond E.
Battles, Willis R.
Brinton, Robert K.
Tierney, Stanley E.
Blackburn, Bilee O.
Thompson, Stanley E.
Wells, Robert J.

MIDDLE ROW:
Wood, Everett M.
Roof, Jack G.
Lauterbach, Richard
Brantley, L. Reed
Seaborg, Glenn T.
Levanas, Leo D.
Pack, Lloyd C.
Fielding, George H.
Nicholson, Redvers G.
Aigner, Herbert L.

BACK ROW:
Baumbach, Harlan L.
Dreher, J. Leonard
Himoe, Clifford E.
Trimble, L. Starling
Bargman, Robert D.
Albaugh, Fred
Bruman, Henry J.
Hillis, Thomas E.
Ohly, F. Robert
Ballou, Gerald
Cooper, Vance R.
Spencer, W. Lee
KAPPA GAMMA EPSILON BECOMES
BETA GAMMA CHAPTER OF ALPHA CHI SIGMA
1935

During 1934 a vigorous campaign was launched to establish what would be the first active chapter of the principal national chemical fraternity, Alpha Chi Sigma, in southern California. Marion E. Dice, past "Grand Master Alchemist" (national president) of Alpha Chi Sigma, now chemical engineer and industrial economist of the General Petroleum Corporation, and L. Reed Brantley, charter member of Kappa Gamma Epsilon, were leaders in this move. Incidentally, Brantley later became not only chairman of chemistry at Occidental College, but also Grand Master Alchemist (1958-59) of the fraternity.

Following nation-wide approval of the proposal by local chapters, KGE "went national," and certificate of admission was signed March 30, 1935 by H. E. Wiedemann, Grand Master Alchemist, John R. Kuebler, veteran Grand Recorder, and other officers, for the new Beta Gamma chapter, with the roster of both junior and senior charter members listed on the next page. An official group picture, corresponding approximately to this roster, is also shown herewith. The framed document may be seen in the Chemistry Library at UCLA.
THE NEW BETA GAMMA OF ALPHA CHI SIGMA

Aigner, Herbert L. 
Battles, Willis R. 
Baumbach, Harlan L. 
Blackburn, Billee O. 
Blohm, Clyde L. 
Bould, Howard C. 
Brantley, L. Reed 
Brown, George M. 
Brown, Keith E. 
Bush, Armand J. 
Cooper, Vance R. 
Dolezal, Frank J. 
Evenson, Raymond E. 
Fielding, George H. 
Herbrand, Albert M. 
Himoe, Clifford E. 
Jasaitis, Zene V. 

Kienzle, Fred H. 
Lauterbach, Richard 
Levanas, Leo D. 
Morgan, Donald P. 
Nicholson, Redvers G. 
Ohly, F. Robert 
Osborne, Darrell W. 
Pack, Lloyd C. 
Seaborg, Glenn T. 
Spencer, Wm. Lee 
Thompson, Stanley E. 
Tierney, Stanley E. 
Tomblin, James F. 
Trimble, L. Starling 
Wells, Robert J. 
Wilkinson, George 
Wood, Everett M.

Faculty

Crowell, William R. 
Robertson, G. Ross

(See the foregoing section on Kappa Gamma Epsilon, which includes a photograph taken during the period when that local fraternity was engaged in proceedings of transfer to national status as Beta Gamma Chapter of Alpha Chi Sigma.)
BETA GAMMA INSTALLATION GROUP


(Copy by permission)
In more recent years the Department has been glad to have a local chapter of the Student Affiliates of the American Chemical Society, which stimulates interest of chemistry majors in joining the American Chemical Society. Weekly meetings are held, and lectures by local and visiting scholars are scheduled. The chapter also cooperates with the Department in certain social events, including the occasional department picnic.

Another cheerful and enthusiastic organization is the group informally known as the "Chemistry Wives" club. Membership is open to graduate students' wives, not girl graduate students. The group meets monthly, and discusses such weighty matters as music, book reviews, recipes and babies. A faculty-wife sponsor assists, presumably without necessity of strict chaperone rules. The club seems to be a feature of recent years only, since completion of the new Chemistry Building. Mrs. William G. Young served as sponsor in 1954-57, Mrs. J. D. McCullough 1957-59, and the heavy responsibility now lies on the shoulders of one of the youngest faculty wives, Mrs. Roberts A. Smith.
CHAPTER 24

DOCTORAL THeses IN CHEMISTRY, 1942–1959

The following list of scholars who have officially received the degree of doctor of philosophy in chemistry is arranged approximately according to year in which a dissertation was completed. Such chronology does not always agree exactly with the Registrar’s annual lists of graduates. An official list is compiled only once a year. A name may thus appear in a list of a subsequent year, and not until summer. There may also be special cases where the official grant of degree was delayed still further pending completion of certain technical requirements. The record of 1959 may thus be incomplete. Theme titles are abbreviations, with occasional use of "etc." to indicate multiple topics. Bound volumes of dissertations may be seen in the Chemistry Library.

Honor of the first completion of a Ph.D program in chemistry at UCLA goes to Dr. Theodore Vermeulen, who became Professor of Chemical Engineering in the Department of Chemistry and Chemical Engineering of the University of California, Berkeley.

Degrees in combined fields such as "physical-biological sciences" are not included.
UCLA DOCTORS OF PHILOSOPHY IN CHEMISTRY

(Name of an academic institution, without other indication, means that the person named just above was a member of the instructional staff in chemistry at that institution, according to the most recent office record on file in the UCLA Chemistry Department.

<table>
<thead>
<tr>
<th>Doctor of Philosophy in Chemistry</th>
<th>General Topic of Thesis (Recent Professional Connection)</th>
<th>Doctoral Research Director</th>
</tr>
</thead>
</table>

1942

- **Buckles, Robert E.**
  - Replacement reactions
  - (State University of Iowa)
  - **Winston**

- **Frieden, Edward H.**
  - Amino acid-formaldehyde reactions
  - (Biological Laboratories, Harvard University)
  - **Dunn**

- **Siegel, Samuel**
  - Addition of Grignard reagents
  - (University of Arkansas)
  - **Young**

- **Skel, Thurston**
  - Kinetics of substituted ethylene dibromides
  - (Shell Development Company, Emeryville)
  - **Young**

- **Vermeulen, Theodore**
  - Ferrihemoglobin derivatives
  - (Chem. Engineering, Univ. Calif. Berkeley)
  - **Coryell**

1943

- **Andrews, Lawrence J.**
  - Allylic rearrangements, etc.
  - (University of California, Davis)
  - **Young**

- **Clinton, Raymond O.**
  - Plant pigments
  - (Sterling-Winthrop Research Institute)
  - **Geissman**
1943, concluded

Cristol, Stanley J.  
Bromine elimination from organic compounds  
(University of Colorado)

Tulagin, Vsevolod  
Limonin; cyclic ketones  
(Minnesota Mining and Mfg. Co., St. Paul)

1944

Golichman, Eugene L.  
Dissociation constants of salts  
(North American Aviation)

Henderson, Robert B.  
Antimalarial compounds, synthesis of  
(Long Beach State College)

Icke, Roland N.  
Antimalarial compounds  
(Pasadena Research Laboratories)

Meier, Richard L.  
Butenyl magnesium halides  
(University of Chicago, social studies)

Roberts, John D.  
Butenyl Grignard reagent  
(California Institute of Technology)

Seymour, Dexter C.  
Antimalarial compounds  
(313 Voorhis St., Wyckoff, N.J.)

Tuttle, William Penn  
Polymerization of phenoxyacetylene; dissertation on microfilm  
(Deceased)

Webb, Irving D.  
Allylic replacement reactions  
(Director of organic chemical research, Union Oil Company, Brea laboratory)
1945

Linden, Gustave B. Jacobs
Propanolamine derivatives
(General manager, Specialty Resins Co.,
Lynwood, Los Angeles)

Linden, Seymour L. Young
Compounds related to vitamin A
(Production manager, Edward Hyman
Company, Los Angeles)

1946

Campbell, Tod W. Young and McCullough
Organometallic compounds
(Experimental Station. E. I. du
Pont de Nemours Co., Wilmington)

Kepner, Richard E. Young
 Allylic rearrangements; halogen compounds
(University of California, Davis)

König, Otto Crowell
Analysis of the gold group
(Baroid Sales Division of the Inter-
national Lead Company)

Levy, Edward F. Jacobs
 Beta- amino alcohols as antimalarial agents
(Gillette Safety Razor Co., Boston)

Spaeth, Earl C. Jacobs
 Beta- and gamma- amino alcohols
(University of Connecticut, Storrs)

1947

Akawie, Richard I. Geissman
Halohydrins; naphthalene derivatives
(Atomic Reactor Project of North
American Avk, Los Angeles)

Friess, Seymour L. Geissman
Flavone derivatives
(University of Rochester)
Grunwald, Ernest M.  
Solvolytic substitution  
(Florida State University)  

Gunther, Francis A.  
Derivatives of compounds from the  
Euphorbiaceae  
(Insect toxicology, Univ. Cal. Riverside)  

Seubold, Frank H.  
Neighboring groups in free radicals  
(Res. Lab., Union Oil Co., Brea)  

1948  

Brinton, Robert K.  
Photolysis of deuterodacetaldehyde  
(Univ. California, Davis)  

Florsheim, Warner H.  
Steric hindrance; acids  
(U.S. Veterans’ Service, isotope research, Long Beach, Calif.)  

Jones, Harrison W.  
Nucleophilic displacement  
(Western Regional Laboratory, Albany, Calif.)  

Keller, James L.  
Cleavage of bonds  
(Res. Lab., Union Oil Co., Brea)  

Wilson, Katherine W.  
Butenyl Grignard reagent  
(Air pollution research, College of Engineering, UCLA)  

1949  

Calvert, Jack G.  
Photolysis of butyraldehydes  
(Ohio State University)  

Day, Bruce F.  
Cholesterol; diazoamino compounds  
(E. I. du Pont de Nemours Co., Wilmington)  

Drell, William  
Analogues of pantothentic acid  
(Veterans Ad, research, biomedical, West LA)
Friess, Betsy Morse  
*Wagner-Meerwein reactions*  
(University of Rochester)

Hochman, Harry  
*Beta-aminocetyl esters*  
(U.S. Navy research, Pt. Hueneme, Calif.)

Horowitz, Robert M.  
*Mesitylenic ketones*  
(Fruit and Vegetable Laboratory, U.S. Dept. of Agriculture, Pasadena)

Ingraham, Lloyd L.  
*Methoxyl reactions*  
(Western Regional Laboratory, Albany, Calif.)

McCormick, Robert J.  
*Amidines*  
(Lederle Laboratories, N.Y.)

Merrifield, Robert B.  
*Microbiology; pyrimidines*  
(Monsanto Chemical Co., Glendale, Mo.)

Pitts, James N.  
*Photolysis of aldehydes and ketones*  
(University of California, Riverside)

Rule, Joseph M.  
* Allylic sulfur derivatives*  
(Technical market analysis, E. I. du Pont de Nemours Co., Wilmington)

1950

Boschan, Robert  
*Participation of neighboring groups*  
(Naval Ordnance Test Sta., China Lake)

Brandon, David B.  
*Allylic alcohol reactions*  
(Stanford Research Inst. Pasadena)

Coulson, Dale M.  
*Polarography of glutathione, etc.*  
(Stanford Research Institute, Stanford)
Crane, Robert A. 
Photolysis of aldehydes 
(Dow Chemical Co., Pittsburg, Calif.)

Fukuto, Tetsuo R. 
Physiologically active amines 
(Entomology, Univ. Calif. Riverside)

Goodman, Leon 
Neighboring groups; addition reactions 
(Palo Alto, Calif.)

Gould, Edwin S. 
Organo-selenium compounds (X-ray diff., etc.) 
(Brooklyn Polytechnic Institute, N.Y.)

Hagmann, David L. 
Grignard reagent 
(Calif. Research Corp., Richmond, Calif.)

Hinreiner, Elly H. 
Chromones 
(Retired by marriage from Univ. Calif. 
Davis, food technology division)

Johnson, Carl E. 
Catalysis of redox reactions 
(Calif. Research Corp., La Habra)

Marsh, Richard E. 
Crystal structure of organo-selenium compounds 
(Research, Calif, Inst. Tech.)

Moje, William 
Benzal-coumarone pigments 
(Research, Univ. Calif. Riverside)

Reed, Russell 
Cycloaliphatic carboxylic acids 
(Naval Ordnance Test Sta., China Lake)

Scott, Willard R. 
Phenylalkoxyacetylenes 
(Private chemical business)

Singer, Stanley 
Alkyne-allene isomerization 
(Hughes Tool Co., Culver City)
1951

Boyer, Myron H.  Ramsey
Vanadium-iodine reactions
(Aeroneutronics Systems, Inc.,
Newport Beach, California)

Bryden, John H.  McCullough
Benzeneseleninic acids
(Naval Ordnance Test Sta., China Lake)

Denison, Jack  Ramsey
Ion-pairs in nonaqueous media
(Experimental Station, E. I. du Pont
de Nemours Co., Wilmington)

Furman, Sydney O.  Garner
Spectrophotometry; vanadium compounds
(General Electric Co., Vallecitos, Calif.)

Lindgren, C. Robert  Weinstein
Steric hindrance
(Sales and technical advice to manufacturer-
consumers, E. I. du Pont Co., L.A. region)

Meier, Dale J.  Garner
Kinetics of europium exchange reactions
(Shell Development Co., Emeryville)

1952

Abd-Elhefetz, Fathy A.  Cram
Stereochemical studies
(Fuad University, Cairo, Egypt)

Berr, Charles E.  Weinstein
Reactions of halogens with silver salts
(Fiber dept., E. I. du Pont Co., Wilmington)

Deutsch, Alfred  Dunn
Analysis of nucleic acid
(California Foundation for Biochemical
Research; res. and mfg. of biochemicals)

Eiduson, Samuel  Dunn
Nutritional problems; lactic acid bacteria
(Veterans Adm. Center, West LA; research)
Garner, Bruce L.                  Young
Pentenyl Grignard reactions
(Los Angeles Soap Company, L.A.)

Gordon, Robert J.                  Geissman
Reactions of acetals with Grignard reagents
(Shell Oil Company, Martinez, Calif.)

Hatch, Melvin J.                   Cram
The Neber reaction
(Dow Chemical Co., Midland, Michigan)

King, William R.                   Garner
Chromium and vanadium compounds
(Kaiser Aluminum Co., Permanente, Calif.)

Knight, Jack D.                    Cram
Wagner-Meerwein rearrangement, etc.
(California Research Corp. Richmond, Calif.)

Kosower, Edward M.                 Weinstein
The "i-sterol" rearrangement
(University of Wisconsin)

Marshall, Henry P.                 Weinstein
Solvolyis
(Stanford Research Institute, Stanford, Calif.)

Miller, Arnold                     Blacet
Photolysis of ketones
(Borg-Warner Corp., Des Plaines, Ill.)

Mixer, Robert Y.                   Young
Reactions of sodium allyl benzene
(Stanford Research Inst. Stanford, Calif.)

Steinberg, Howard                  Cram
Macro rings
(U. S. Dept. of Agriculture Labs. Pasadena)

Tewes, Howard A.                   James
Thorium reactions
(Radiation Laboratory, Livermore, Calif.)

Traylor, Teddy G.                  Weinstein
Electrophilic substitution, etc.
(Dow Chemical Co., Pittsburg, Calif.)
1953

Aaron, Herbert S.
Solvolyis of tetranyyl derivatives
(Army Chemical Center (Chem. Warfare Labs.)
Maryland)

Armen, Ardy
Labile esters of amino acids, etc.
(Dow Chemical Co., Pittsburg, Calif.)

Bell, Wayne E.
Photolysis of bisacetyl
(Union Oil Company, Brea res. labs.)

Cherkin, Arthur
Tyrosine peptides in silk
(Don Baxter, inc., Glendale, Calif.)

Clement, Robert A.
Nucleophilic displacement
(Univ. Chicago)

Hall, Thomas C.
Photochemistry of nitrogen dioxide, etc.
(Pacific Semi-Conductors, Culver City)

Hawthorne, M. Fred
Steric inhibition, etc.
(Huntsville, Alabama)

Hodgson, Russell L.
Metabolic products of fungi
(Shell Development Co., Emeryville)

Jorgenson, Eugene C.
Flavonoid pigments
(Univ. Calif. Medical Center, San Francisco)

McClure, Lawrence E.
Phenylalanine in protein
(Northeast Louisiana State College,
Monroe, Louisiana)

Mayer, Stanley W.
Application of SWAC in crystallographic calculations
(U.S. Veterans Adm. Hospital, Long Beach)
<table>
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<tr>
<th>Name</th>
<th>Title</th>
<th>Institution</th>
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<tr>
<td>Abell, Jared</td>
<td>Three new cyclophanes</td>
<td>(California Research Corp., Richmond)</td>
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<td>Aitken, Edward A.</td>
<td>Microcalorimeter; epoxide polymerization</td>
<td>(General Electric Company, Cincinnati)</td>
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<td>Allinger, Norman L.</td>
<td>Paracyclophanes</td>
<td>(Wayne State University, Detroit)</td>
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<td>Baumgartner, Herman J.</td>
<td>Niobium reactions</td>
<td>(Shell Development Co., Emeryville)</td>
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<td>Caserio, Frederick F.</td>
<td>Reactions of allylic alcohols</td>
<td>(Research, Calif. Inst. of Technology)</td>
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<tr>
<td>Glick, Richard E.</td>
<td>Nucleophile displacement</td>
<td>(Pennsylvania State University)</td>
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<td>Hardwick, E. Russell</td>
<td>Scintillation process</td>
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<td>Heck, Richard F.</td>
<td>Methoxyl and aryl reactions</td>
<td>(Hercules Powder Company, Wilmington, Del.)</td>
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<td>Wilk, Immanuel J.</td>
<td>Displacement in allylic systems</td>
<td>(Research, Stanford Univ.)</td>
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<td>Allinger, Janet</td>
<td>Stereochemistry of quaternary compounds</td>
<td>(Research, Wayne State Univ., Detroit)</td>
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<td>Clippinger, Everett</td>
<td>Solvolysis studies</td>
<td>(California Research Corp., Richmond)</td>
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<tr>
<td>Gordon, Martin</td>
<td>Closing of five-membered ring</td>
<td>(Golgate Company, New Jersey)</td>
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233
Davis, Charlotte T.  
Khellin analogues, etc.  

Fisher, Billy Bell  
Transitions in adsorbed phase  
(Chemistry Division, Los Alamos Scientific Laboratories, Los Alamos, N. M.)  

Geller, Edward  
Nucleosides, etc.  
(Veterans Adm. Center, West LA: biochem res)  

Gregorian, Razmio  
Cytisine derivatives, etc.  
(M. W. Kellogg Co., Jersey City)  

Juvet, Richard S., Jr.  
Chelates; rhenium chemistry  
(University of Illinois, Urbana)  

Kruse, Ferdinand H.  
Crystal structures of organotellurium compounds  
(Univ. Calif. labs., Los Alamos, N. M.)  

Levy, Harvey M.  
Ethionine; relation to tumors  
(Brookhaven Laboratories, Upton, L.I., N.Y.)  

Linder, Bruno  
Nuclear isomers  
(University of Wisconsin)  

McNall, Lester R.  
Quinuclidone, etc.  
(Paper Mate Pen Company, Culver City)  

Prosem, Richard J.  
Crystallography of perchlorates  
(Minneapolis-Honeywell Co., Minneapolis)  

Shih, Chin-Hua  
Allylic amines  
(Research, Calif. Inst. Tech.)  

Thompson, Walter H. Jr.  
Allylic Grignard reagents  
(Air Research Mfg. Co. of Arizona, Phoenix, Ariz.)  

Geissman  
McMillan  
Dunn  
Geissman  
Pecosk  
Trueblood  
Dunn  
James  
Geissman  
Trueblood  
Young  
Young
Wolkowitz, Howard
Homogentisic acid
(Veterans Hospital, Downey, Ill.)

Zuckerman, Richard
Ion-exchange chromatography
(Veterans Adm. Center, biochem. res.)

1956

Blatt, Jeremiah L.
Filter-paper chromatography
(Mt. Holyoke College, Mass.)

Bloom, Murray
Atropine, etc.
(Hughes Aircraft Co., Culver City)

Bower, Joseph G.
Iodine and electron donors
(U.S. Borax and Chem. Co., Whittier)

Brecher, Arthur S.
Hydrogenase of E. coli
(Research, biochem., Purdue Univ.)

Colter, Allan K.
Hydrogen shift in bicyclic system
(Carnegie Institute of Technology)

Dankner, David
Acetylene-allene phototropy
(Visking Corporation, Chicago)

Deuel, Peter G.
Chemical Compounds from Compositae
(Sacramento State College)

DeVries, Louis
Solvolyis and rearrangements
(California Research Corp., Richmond)

Dunham, John M.
Studies in coulometry, polarography
(Sterling-Winthrop Res. Institute,
Rensselaer, N.Y.)

Goodrow, Marvin H.
Alkadienes and dimers
(University of Michigan)
Harmer, Don S.  
Properties of Nd_{141}  
(Georgia Institute of Technology)

Hessel, Donald W.  
Propargyl halides  
(College of Medical Evangelists, Loma Linda)

Johnson, Duane E.  
Allylbenzene derivatives  
(U.S. Rubber Co., Research Center, N.J.)

Juster, Norman  
Alkoxyacetylene polymerization  
(Pasadena City College)

Lapporte, Seymour J.  
Free-radical rearrangements, etc.  
(California Research Corp., Richmond)

Lepp, Albert  
Glutamine metabolism  
(USC Medical Center, research)

Magee, Philip S.  
Participation in solvolysis  
(California Research Corp., Richmond)

McCarty, John E.  
Amine oxide elimination, etc.  
(Postdoctoral fellow, Univ. Kansas)

McFadden, Bruce A.  
Metabolism of hydrogenomonas  
(Washington State Univ., Pullman)

McLaughlin, Edward P.  
Thermodynamics of fluorocarbons  
(Gillette Safety Razor Company, Boston)

Nyquist, H. Leroy  
Wagner-Meerwein rearrangement  
(Univ. California, Santa Barbara)

Reeves, Richard A.  
Paracyclophane derivatives  
(Shell Development Co., Emeryville)
Sawyer, Donald T.
Coulometry; chelates, etc.
(Univ. California, Riverside)

Sporer, Alfred H.
Adsorption chromatography
(Research labs., IBM, San Jose)

Steelink, Cornelius I.
Biosynthesis of flavonoids
(University of Arizona, Tucson)

Tideswell, Norman W.
Selenium compounds
(Shell Development Co., Emeryville)

Yuwiler, Arthur
D-Glutamic acid, naturally-occurring
(Research biochemist, Univ. Michigan)

1957

Baird, Richard L.
Aryl-ion participation
(Yale University)

Baum, Kurt
Propargylic compounds; related allenes
(Aerojet-General Corp., Azusa)

Boor, John
Polymerization of acetylenes, etc.
(Shell Development Co., Emeryville)

Hellberg, Lars H.
Hydrolysis of hindered esters
(San Diego State College)

Kaufman, Bernard T.
Glucose metabolism
(Brandeis University)

McNall, Earl G.
Nitrate reduction in E. coli
(Research, dermatology, UCLA Medical Center)

Reimann, Hans
Steroid nucleus
(Schering Corp., Bloomington, N.J.)
Sinclair, Harold K.  
Structure of verbenalin  
(E. I. du Pont Co., Electrochemical Dept., Wilmington)

Smathers, Donald L.  
Alkaloids from Amaryllidaceae  
(E. I. du Pont Co., Wilmington)

Tadaniel, John S.  
Stereochemistry; solvolysis  
(Postdoctoral fellow, Univ. Illinois)

Wechter, William J.  
Stereochemistry of cyclophanes  
(Upjohn Company, Kalamazoo, Mich)

Wilcox, Charles F.  
Non-conjugated chromophores, etc.  
(Postdoctoral fellow, Harvard University)

1958

Antar, Mohamed F.  
New paracyclophanes  
(Tidewater Oil Company, San Francisco)

Bauer, Ralph H.  
Stereoelectronic studies; cyclophanes  
(Shell Development Co., Emeryville)

Bauer, Ronald S.  
Polyhalogenated allenes  
(Shell Development Co., Emeryville)

Cho, Arthur K.  
Furoquinoline ring system  
(Dept. pharmacology, UCLA Medical, research)

Christofferson, Glen D.  
Crystal structure of Group-VI elements  
(California Research Corp. Richmond)

Coleman, George H.  
Disintegration of Nd¹⁴¹  
(Radiation Laboratory, Livermore)

Darwish, David  
Nonhydroxylic solvents  
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<td>Henry, David W.</td>
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Sharman, Samuel H.  
**Allylic chlorosulfimates, etc.**  
(Postdoctoral fellow, Mass. Inst. Tech.)

Sparks, Robert A.  
**Structures from crystallography**  
(Univ. Computing Laboratory, Oxford, Eng.)

Stafford, Earl T.  
**Norbornyl derivatives, etc.**  
(Deceased)

Takahashi, Nobuyoshi  
**A-Norcholestenone**  
(Postdoctoral fellow, Univ. Michigan)

Takimoto, H. Henry  
**Allylic Grignard chemistry**  
(Hughes Aircraft Co., Culver City)

Vanselow, Robert D.  
**Photolysis of benzaldehyde**  
(California Research Corp., Richmond)

Willcockson, George W.  
**Substituted acetylenes**  
(U.S. Borax and Chemical Corpn., Anaheim)

1959

Allred, Evan L.  
**Methoxyl participation and ion pairs**  
(NSF Postdoctoral Fellow, Univ. Colorado)

Bingham, Carleton D.  
**Nuclear isomers of Intermediate-Z nuclides**  
(Radiological Safety Engineer, UCLA Medical Center)

Brownfield, Robt. B.  
**Introduction of nitrogen and oxygen into the steroid nucleus**  
(Lederle Division of American Cyanamide Co., Pearl River, N.Y.)

Inami, Y. Harry  
**Thermodynamic properties of salts in nonaqueous solutions**  
(Aeroneutronics Systems, Inc., Newport Beach, California)
Klinedinst, Paul E. Jr.  
Salt effects and ion pairs  
( NSF Postdoctoral Fellow, Harvard University)

Lamb, Sandra I.  
Reactions of butenyl dihalides with diethylamine  
(Postdoctoral Fellow, UCLA, ½ time, and instructor, Santa Monica City College, ½ time)

Porter, Richard A.  
Environmental effects on radioactive-decay rates  
(Radiation Laboratory, Livermore)

Speer, Donald A.  
Abnormal displacement reactions of allylic systems  
(Rohm and Haas, Philadelphia)

Young  
Winstein  
McMillan

During earlier years only the B.A. degree was given; later the B.S. This difference is purely a nomenclature, since all of the nature's degrees in chemistry were supposed to be based on scientific research.

Bobelshofer  
Robert, M.A.A.  
Rebeneth  
Bachelier  
1925  
Baumbach, Harlan L.  
Estimation of ammonia  
Crowell  
Roth, Fred S.  
Photolysis of acetaldehyde  
Hillcoat  
Winston, Sam  
Allylic Rearrangements  
Young
CHAPTER 25

MASTERS' THESES IN CHEMISTRY AT UCLA

Most of the candidates for the master's degree have followed the "thesis plan," making it possible to report below a theme and research director. A few were permitted to choose the alternate method "by examination," in some cases on account of war exigencies. In other cases a dissertation was omitted in view of the intention of the candidate to proceed at once for the doctor's degree. One dissertation for the whole study was then planned. In such cases only the name of the scholar is given, this being from official listing by Registrar.

During earlier years only the M.A. degree was given; later the M.S. This difference is purely a technicality, since all of the masters' degrees in chemistry were supposed to be based on scientific research.

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<td>Estimation of osmium</td>
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<td>Roof, Jack G.</td>
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<td>Weinstein, Saul</td>
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1935
### Masters' Degrees, continued

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<td>Albrecht, Gustav A.</td>
<td>Crystalline amino acids</td>
<td>Dunn</td>
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<td>Fielding, George</td>
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<td>Lasher, Edward A.</td>
<td>Metals in allyl reactions</td>
<td>Young</td>
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<td>Jasaitis, Zene V.</td>
<td>Octanediols</td>
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<td>Kaufman, Norman L.</td>
<td>Butenyl halides and metals</td>
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<td>Lane, John F.</td>
<td>Allylic rearrangements</td>
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<td>LuValle, James E.</td>
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<td>Rittenberg, Sydney C.</td>
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<td>Rubin, Jerome</td>
<td>Hydrogenation of butadiene</td>
<td>Young</td>
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<td><strong>1938</strong></td>
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<td>Bollinger, Howard M.</td>
<td>Hydrogenation of butadiene</td>
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<td>Evenson, Raymond E.</td>
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<td>Pressman, David</td>
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<td>Photolysis of aldehydes</td>
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<td>Wasserman, David M.</td>
<td>High frequency in kinetics</td>
<td>Ramsey</td>
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1939

Azorlosa, Julian L. Allylic rearrangements Young
Blaedel, Walter J. Photolysis of aldehydes Blacet
Cristol, Stanley J. Grignard reactions Young
DeVorkin, Howard Trivalent vanadium Ramsey
Evans, Ross A. Reduction of nitrobenzene Robertson
Kaplan, Louis Hydrogenation of butadiene Young
Moulton, Robert W. Photochemical decomposition of acetaldehyde and glyoxal Blacet
Orr, William G. X-ray spectrography of selenium McCullough
Siegel, Samuel Allylic rearrangements Young
Taurog, Alvin Azomethane; photochemistry Blacet

1940

Eisner, Morton P. Allylic rearrangements Young
Frieden, Edward H. Optical study of histidine Dunn
Furst, Arthur Orthosemidines Stone
Heldman, Julius D. Photolyses Blacet
Hume, David N. Chromous compounds Stone and Coryell
Kleppisch, Paul Allyl Grignard reactions Young
McKinnis, Art C. Reactions of allylic alcohols Young
Manchesian, Jake T. Conductance studies with quaternary salts Ramsey
Morris, Lester Grignard reactions Geissman
Pack, Lloyd C. Kinetics of vanadium reactions Ramsey
Rappoport, D. Cinnamyl magnesium chloride Young
Warner, Ruth B.  Allylic rearrangements  Young  
1941
Abers, Elliot  Ferrihemoglobin, etc.  Coryell
Andrews, Lawrence J.  Butenyl derivatives  Young
Arnold, Winninette  Photolysis of acetaldehyde, etc.  Blacet
Baumgarten, Erwin  Grignard reactions  Geissman
Clinton, Raymond O.  Activated carbon  Stone
Gunther, Francis A.  Arylacetylenes, etc.  Jacobs
Kleber, Eugene V.  Organic chemistry and crystallography of eriodictyol  Geissman and McCullough
Loeffler, Donald E.  Photolysis of aldehyde mixtures  Blacet
Luke, Wayne W.  Halides in photographic developers  McCullough and Crowell
Mertes, Richard W.  Potentiometry of osmium  Crowell
Pokras, Harold H.  Butenyl Grignard reactions  Young
Skei, Thurston  Dibromosuccinate reactions  Young
Toyotome, Masumi  Quaternary compounds  Ramsey
Tulagin, Vsevolod  Cyclic beta-diketones  Geissman
Warwick, Delbert L.  Naphthyl Grignard reactions  Jacobs
Wax, Harry  Allylic rearrangements  Young

1942
Colichman, Eugene  Potentiometry of vitamin C  Ramsey
Espoy, Henry M.  Phenylpropionic acid derivatives  Jacobs
Hanson, John E.  Diene synthesis  Jacobs
Henderson, Robert B.  Role of neighboring groups

Icke, Roland N.  Compounds of marijuana type

Kepner, Richard E.  Plant pigments

Lewis, W. Burton  Ferrihemoglobin derivatives

Love, Bernard  X-ray spectrography of dithionates

Meier, Richard L.  Hydrogenation of butadiene

Searles, Scott  Hydrogenation of unsaturated ethers

Sexton, Edwin L.  Dipolar ions

Seymour, Dexter C.,II,  Optical rotation

Sugimoto, Roy  Oxidation of trivalent vanadium

Webb, Irving D.  Allylic acetates

1943

Akawie, Isidore  Grignard reactions with halogen compounds

Edmiston, Walter C.  Trivalent vanadium

Fukushima, David K.  Hydroxychalcone derivs.

Hanson, Carolyn F. W.  Acetolysis kinetics

Hanson, William J.  Indene acids

Linden, Gustave B.  2,6-Dimethoxybenzoic acid

Linden, Seymour  Isopropyl Grignard reactions

Noda, Lafayette  Structure of unedoside

1944

Bond, John  Antimalarials

Brady, Edward L.  -
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<td>Ester condensations</td>
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Pitton, James A. Polarography of semidines Stone and Pecsko
Pullen, Edward A. Aldehyde reactions Winkstein
Tewes, Howard A. Vanadium ions Garner
Thomas, Seymour, Jr. Microbiology - peptides Dunn
Zimmerman, Robert L. Carbon suboxide in Grignard reactions Cram

1951
Brown, Earlene Methyl propiolate Jacobs
Steinberg, Gunther Verbenalin Geissman
Vijayaraghavan, Puliyur K. Vitamin B₁₂ Dunn
Whiteker, Roy A. Coulometry Farrington

1952
Bloom, Murray Oxidation of benzhydrazides Stone and Geissman
Eckerson, Bruce A. Diaryl selenium dihalides McCullough
Kelly, S. Kathleen Polarography of organic compounds Crowell
Oura, Midori Lactobacillus, nutrition Dunn
Remy, David C. A steroid pyridazinone Jacobs
Sha, Yi-hsien Products from penicillium molds Cram
Varland, Robert H. Substituted benzyamines Geissman

1953
Bryan, William P. Radiochemistry with use of thenoyltrifluoroacetone James
Kay, Lois M. Use of celite in chromatography Trueblood
Kowalkowski, Richard L. Coulometry Farrington
Maverick, Emily F. Polarography of titanium Pecok
Sparks, Robert A. Solvolysis of glycol derivatives Weinstein

1954
Farris, Glen D. Acetylene-allene rearrangements Jacobs
Larson, Linda L. ------
Lieberman, Isaiah U. Benzyl derivatives Cram
Mori, Atau Pyrazoles Jacobs
Schaefer, William P. ------
Sporer, Alfred H. ------

1955
Booth, Frank B. Iron II-bromine reaction Farrington
Chiwaki, Noriko Proton-induced reactions James
Davis, Grace M. Amino acids and tumor growth Dunn
Goodenow, Elden L. Tungsten octacyanide Garner
Markey, Sister Gilmary Nutrition of Leucomostoc Dunn
Semanne, Henri M. Stereochemistry Cram
Staggs, Edwin A. Butadiene derivative Jacobs
Uchida, Makio Benzoquinoneacetic acid Dunn

1956
Goldsmith, Harry Quinuclidine salts Geissman
Hoijer, Dorothy J. Composition of bacterial cells Dunn
Littig, Howard L. Polymerization of allenes Jacobs
Lovett, Sarah L. Tuberculoprotein comp. Dunn
Martin, Albert E. Coulometric intermediates Farrington
1957
Chin, Jack  Cobalt in coulometry  Farrington
Hawkins, Gordon L.  Enneachloroditungstale ion  Garner
Mehta, Chandrakant J.  Amino acids in uremic plasma  Dunn

1958
Edgington, Howard C.  Coulometric intermediates  Farrington
Griggs, Bruce  Boron reactions  Stone
Hirmivies, Mirja A.  Steroids with modified A-rings  Jacobs
Mazer, Roger J.  Coulometry of iron  Farrington
Slaten, Lynore E.  Chromium compounds  Garner

1959
Baginsky, Marietta L.  Amino acids in tumors  Dunn
Bell, Virginia M.  Metabolism of nicotine in Nicotiana tabacum  Leete
Gillespie, Richard B.  Crystal structure of ammonium chlorite  Trueblood
CHAPTER 26

SPECIAL ACHIEVEMENTS OF CHEMISTRY GRADUATES

In this concluding chapter are cited four unique examples of unusual vocations, or avocations, of alumni from the local chemistry department. First, a record of scholarly accomplishment and administrative skill:

1. A Chemist Attains High Academic Distinction

Glenn T(heodore) Seaborg, boyhood resident of Los Angeles, took the A.B. in chemistry in 1934. Before this event, however, he had long since reached the position of chief laboratory assistant as well as research assistant, in quantitative analysis, under direction of Professor William R. Crowell.

Following transfer to the University at Berkeley, Seaborg not only took the Ph.D. with honors, but also was immediately appointed instructor and personal research assistant to G. N. Lewis. Wartime duties in Chicago took him into nuclear chemistry. Return to Berkeley, and continuation of his brilliant research program led to numerous honors, including National Academy, ACS and Royal Society awards, Nichols medal and Nobel Prize(1951.) Finally, when Clark Kerr was invited to take the top chair of the University(1958), the President-elect knew exactly whom to recommend as his successor in the office of Chancellor at Berkeley.
Chancellor Glenn T. Seaborg
University of California, Berkeley
2. A Chemist Excels in Music

During early months of World War II, one Jerome Hines, chemistry major working in the south end of the old Chemistry Building (now Haines Hall) would sally forth at times to the storeroom at the north end. Perhaps he would feel like the Devil, meaning Mephistopheles of the opera Faust, and would let out a vocal blast that would shake the hollow tiles of the corridor, entertaining the rest of us in his powerful *basso cantante* range. No, there was no acoustic treatment in the corridor!

In spite of, or with help of, this unusual vocal talent, Jerry graduated with high rating as a chemistry-mathematics major, took considerable graduate training and served as teaching assistant in chemistry. Then followed a term as chemist for the Union Oil Company at Wilmington, California.

But the youthful songbird had attracted major attention elsewhere – specifically, the attention of Gennaro Curci, grand opera star of earlier days, more recently voice teacher in the upper levels of Los Angeles’ music studios. Jerry soon found place in west coast opera, and has long since gone to the top as a member of the famous Metropolitan in New York.

In addition to his agile performance as a youthful "Méphistopheles", Hines has sung more than forty grand-
opera roles, including a very popular specialty, the title role of Mozart's *Don Giovanni*, which fits his six-foot seven-inch figure beautifully. But his "hobby" chemical laboratory in New York has had scant attention lately; Jerry is storing it for his little son, as yet only five years of age.

![Jerome Hines](image)

**JEROME HINES**

Basso, Metropolitan Opera Association
3. A Chemist Excels in Sports

Julius D(avid) Heldman, chemistry major at UCLA during the famous nineteen-thirties, created a mild sensation in 1936 as a sophomore, age 17, by winning the national junior singles and doubles tennis championships. Chemical scholarship, excellent; A.B. 1939, M.A. 1940 (see page 234) and Ph.D., physical chemistry, Stanford, 1942. There followed a fine record both in war activities and industry. Just for good measure Julius wrote a neat little book on glassblowing. He is now Assistant Manager of Manufacturing Research with Shell Oil Co., New York.

In spite of technology Julius just loves tennis. Although his wife never played a game in her life until after the two Heldman daughters were born, she got the inspiration and became the top-ranked woman player of Texas. The girls have done nicely too. Present score:

<table>
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<tr>
<td>Julius</td>
<td></td>
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<tr>
<td>Mrs. Heldman</td>
<td>100</td>
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<tr>
<td>Carrie and Julie</td>
<td>80</td>
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</table>

No wonder the Heldman home is called the "Grand Central Station" of tennis, with such social callers as Budge, Savitt and Talbert. Just to show that the old man himself can still get around the court, he was beaten last year in the national indoor championships in New York only in the finals, by no less than Alejandro Olmedo, (Wimbledon champion, 1959.)
Acknowledgment and thanks to the Shell Oil Company, New York City, for their generous contribution of photographic illustrations, used some months ago in their national magazine.
4. A Chemist Becomes a Manufacturer

Now that this chapter has paid compliments to nuclear chemistry, to music, and to sports, it is only fair to give honorable mention to chemical industry. This time the citation goes to a long-time good friend of the Chemistry Department, Edward A. Lasher.

We have no trouble at all remembering Lasher as an undergraduate during the early nineteen thirties, when a chemistry major rejoiced heartily if he had enough cash to buy himself lunch. What he may have lacked in funds was compensated by plenty of intelligence as well as good nature.

After the regular curriculum with high scholastic records, including undergraduate research and a master's degree (page 235) Lasher got a job with Capt. W. A. Bush's famous California Flaxseed Products Company in southeast Los Angeles. Here he learned faithfully how to polymerize just long enough without having to dynamite the product out of a five-ton reactor. But the important
move came only three years later, when Lasher displayed the enterprise seldom seen in the ordinary chemistry graduate, and "went out on his own."

To make a long story short, Specialty Resins Company, with sixty employees, some from UCLA, puts out large quantities of polyester products, notably modern phthalate and ultramodern "modified" isophthalate resins of alkyd type in Lynwood, Los Angeles. Lasher not only produces sheet polymer and polymer molding material, but also is active in manufacture of chemical intermediates, including dibutyl phthalate, diethyl phthalate, adipate esters, and other compounds.

Now if the reader will pardon a gratuitous offering of economic philosophy by the present (conservative) chronicler: Lasher's accomplishment, albeit just one man's way of earning a good living, is a very significant contribution to the economic stability of the country. That's why it was singled out for citation.

As far as the ninth decade of Department history is concerned, let the next fellow start Volume II. We shall conclude in the words of the barrister finishing off an old-fashioned affidavit-

"AND FURTHER DEponent SAITH NOT."
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