Fifty Years in Bailey Laboratory
Fifty Years in Bailey Chemical Laboratory
At the University of Kansas

by Robert Taft
Professor of Chemistry

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Professor E. H. S. Bailey in whose honor Bailey Chemical Laboratory was named.
(From a photograph made in his private laboratory in 1914.)
Foreword

In the brief time available, the attempt has been made to trace out the story of the first fifty years in Bailey Chemical Laboratory and its workers. Some of the achievements of these years will be found in the bibliography which appears at the end of this brochure. I am indebted to many members of the chemistry and pharmacy staff, both senior and junior, for aid in compiling the lists included. Appreciation should also be expressed to Mr. Dolph Simons and the Lawrence Journal-World for permission to use files of Lawrence newspapers and to Miss Maud Smelser of the University of Kansas Library for valuable aid in locating information.

April 12, 1950

Robert Taft
Bailey Laboratory, Fall of 1900.
Early Beginnings
1900-1910

The University of Kansas at the time construction began on Bailey Chemical Laboratory in 1899 housed its activities in seven buildings: the Fine Arts building (Old North College, razed in 1919), Spooner Library (now the Spooner-Thayer Museum), Blake Hall, Fraser Hall, the Chemistry Building (the present journalism building), Snow Hall ("Old" Snow, razed in 1934) and Fowler Shops, whose construction was completed in 1899. The campus then extended on the west only a few feet beyond Fowler Shops.

The enrollment of the University had passed the 1,000 mark for the first time in 1896, and a young, able and enthusiastic faculty together with their students were rapidly establishing the reputation of the University as one of the leading educational institutions of the trans-Mississippi West.

Sciences had been early stressed at the University, for the practical turn of mind required by an expanding and developing West had need of all the technical assistance that could be provided by colleges and universities. When the original chemistry building was completed in 1884, for instance, Professor Bailey, in describing the building for Science (v. 3, p. 53, 1884) called particular attention to the fact that the entire ground floor of the new building was to be occupied "by an assay room with crucible and muffle furnaces and complete apparatus for the fire assay of ores, and also by laboratories for blow-pipe work." As this statement suggests, training chemists for work in the mines of the West was an important feature of University instruction in that day.

This building, constructed at a cost of $12,000, was soon overcrowded. The School of Pharmacy, organized in 1885, was also growing, shared quarters in the new building, and in time took over the lower half of the building.

As a result, within five years the need for greater space for chemistry and pharmacy became so evident that requests were made to the State Legislature for funds to construct a larger chemistry building. Little interest could be aroused in the Legislature during the early 1890's, for times were hard, but in the Legislature of 1897 a house bill was introduced which would have appropriated $60,000 for a new chemistry building to be known as Robinson Hall, in honor of the first governor of the State. The Legislature of 1897, however, was controlled by Populists who had been voted into power by a people suffering from hard times and the injustices of large corporations, especially the railroads. The fate of the house bill was not long in doubt under these conditions; in fact, the entire University appropriation was seriously threatened for a time and it was only by the very active influence of friends of the University that the University appropriation, reduced by some ten thousand dollars under that of the previous biennium, was passed.

Two years later, however, times were much better, the Legislature a more nearly normal one for Kansas, and its members were in a much better mood, for an appropriation of $55,000 was made for a chemistry building, and the University was given a yearly appropriation of $120,000, an increase of one-third over the previous year, but still less than the annual budget of the present-day chemistry department.

Professor Bailey and Architect J. G. Haskell left for the East as soon as the appropriation was certain, and visited and examined chemical laboratories of the large universities of the country. On their return, plans were drawn, the site was selected near the western edge of the campus directly across from the newly completed Fowler Shops, and excavation was started on May 20, two months after the appropriation had been made.

The rock quarried in excavation was used to construct the building, which was above ground by the last of September. It was hoped that construction could be carried along with sufficient rapidity so that the building might be used in the spring semester of 1899-1900, but delays prevented its occupancy until the fall of 1900.
The Lawrence World of September 10, 1900, was then able to report:

The new Chemistry building is almost ready for occupation. The builders are at work on it still and the greater number of rooms will be ready to use by the middle of this week, although some of them will be left unfinished this year. The building—just on the top of the knoll west and south of North Hollow, has been planned with the greatest care and knowledge of modern means of building and ventilation. All the rooms are provided with ventilation shafts, while the laboratories contain hoods and ventilators for the carrying away of obnoxious fumes. The east part of the building will be occupied by the Pharmacy School and here are Junior and Senior laboratories. The west end of the building belongs to the Chemistry department and there are here both Qualitative and Quantitative laboratories, as well as a large storeroom and instrument room.

Real work in classes began today, lessons were assigned, text books talked over and now earnest study is about to begin.

This same building, with some minor changes, still houses the activities of the School of Pharmacy and the department of chemistry, although the number of students in the University in the fifty years intervening has grown from 1200 to some 10,000.

The changes that have taken place in our lives in these fifty years are also strikingly revealed from a news item that appeared in the Lawrence World the day after the description of the new chemistry building. This account described the appearance for the first time on Lawrence streets of an automobile, a vehicle "somewhat larger than an ordinary one-seated road wagon." The car had been driven from Topeka at a speed of sixteen miles an hour, the effect on the rider "being something like sitting in front of an electric fan, the air current being so strong."

The staff who began instruction in the new building in the fall of 1900 consisted of Dean Sayre, Assistant Professor L.D. Havenhill, Assistant Professor C. M. Sterling and Instructor D. H. Spencer for the School of Pharmacy; and Chairman E.H.S. Bailey, professor of chemistry and metallurgy, Professor E. C. Franklin, Associate Professor Edward Bartow, Assistant Professor H. P. Cady, Instructor David F. McFarland, one student instructor and Storekeeper George King in the chemistry department. Of this group all but E. C. Franklin, Edward Bartow and David F. McFarland were to spend their lives in the service of the University.

There was no formal opening of Bailey Laboratory on its initial use in 1900, but in the fall of 1902 there was a formal dedication of the building as part of the inaugural ceremonies for Chancellor Frank Strong, the successor of Chancellor Snow. In the meantime Professor Bailey had given a more detailed description of the building, including its floor plans, than had been given by the World account. The description appeared in Science (Dec. 28, 1900) and served, unofficially at least, to make known the fact to the scientific profession of the country that the building was in use. Incidentally, Professor Bailey's spelling of laboratory was not the same as that employed by the World reporter. By the time the building was formally dedicated, the remaining rooms and equipment had been nearly completed. The total cost of the completed building, according to the University Catalogue of 1904-5, was $70,000.

The dedication exercises took place Thursday, Oct. 16, 1902. The Kansas City Section of the American Chemical Society held a meeting in the afternoon, and in the evening the dedication address "The Role of Chemistry in Modern University Education" was given by Dr. Harvey W. Wiley, Chief Chemist of the U.S. Department of Agriculture. (The address, together with an account of the dedication exercises, was published in the Graduate Magazine of the University of Kansas, December, 1902).

The years around 1900 are crowded with many other first events. The first fellowship grant in chemistry, for example, was made in 1900 to Professor Franklin and C. A. Kraus, a graduate student in physics and chemistry, for a continuation of studies on solutions in liquid ammonia, a field which had been started by Cady as a University student in the "old" chemistry building (Journal Chemical Education January, 1933). The grant of $250.00 made by Alexander Monroe, president of the Merchant's National Bank of Lawrence, was soon supplemented by an additional $150.00 awarded to Professor Franklin by the American Academy of Arts and Sciences for the continuation of the work.
Another outstanding event of this early period in the life of Bailey Laboratory was the installation of an air compressor and liquefier as part of the equipment of the department of chemistry. This piece of equipment appears to have been purchased thru the efforts of Professor Franklin, whose contemporary correspondence on the subject has been preserved. The compressor was ordered from the Norwalk Ironworks of Connecticut in the summer of 1901 at a price of $500.00, although the manufacturers had reduced the price by $250.00 as it was for University use. The compressor was not installed until the spring of 1902 and was the first such unit to be placed in use west of the Mississippi. In fact, few such pieces of equipment were in use at the time at any place in the country. From Professor Franklin's correspondence it would appear that in 1901 there were liquid air plants only at Cornell University, at the Massachusetts Institute of Technology and possibly at the University of Michigan. The plant proved to be a real asset to the department in many ways. The important investigation, for example, leading to the discovery of helium in natural gas (Cady and McFarland, Journal American Chemical Society, v. 29, p. 1523, 1907) utilized liquid air in the analysis of the gas. Letters, too, in the correspondence of the department from 1902 to 1917 show that liquid air in the days before commercial production was supplied to schools, colleges, laboratories and individuals in a huge stretch of country from Alabama to Montana. Not only in these ways did the liquid air plant play a useful part but many, many popular demonstrations and lectures on the properties of liquid air

by Professor Franklin and still more extensively by Professor Cady, served to make known the work of the department. Possibly the most important result of all from these lectures was the fact that more than one promising youngster was attracted to the University.

Three years after the completion of Bailey Laboratory, the first doctorate in chemistry was awarded (June, 1903). The recipient was Hamilton Perkins Cady, who, under Franklin's direction, worked out his thesis on concentration cells in liquid ammonia. (Journ. Phys. Chemisty, v. 9, 475, 1905).

Professor Franklin resigned his position at Kansas in the summer after Cady received his degree, and after fourteen years of service on the staff at the University, went to Leland Stanford. His work in physical chemistry was then taken over by Professor Cady.

State service work, always an important factor in colleges and universities supported by a commonwealth, had early been undertaken by both the Pharmacy School and the department of chemistry. From the middle eighties, both Professor Bailey and Dean Sayre had made analyses of waters, drugs and natural products of the state. This work was continued in Bailey Laboratory, where by law a state food and beverage laboratory was established in 1905 and state drug and sewage and water laboratories were begun in 1907. The water laboratory was moved in a few years to "Old" Snow Hall and from there it was transferred to Marvin Hall in 1923. It had passed from the jurisdiction of the Chemistry Department, however, at the end of
World War I. The food and drug laboratories are still maintained in Bailey laboratory.

In the fall of 1906, Robert Kennedy Duncan came to the University as professor of industrial chemistry. In addition to a course in industrial chemistry, Duncan taught organic chemistry during his first year at the University. Duncan's primary concern, however, was a plan to interest industries in establishing research fellowships at universities to investigate problems arising in processing and manufacturing (North American Review, May 1907). In 1907, his celebrated book The Chemistry of Commerce appeared. This book, a well-written and easily understandable exposition of the advantages of scientific research in chemical industry, attracted wide attention. As a result, Duncan was able to start his fellowship system at the University of Kansas, and by the fall of 1909 twelve fellows, including several post-doctoral fellows, were at work on some eleven projects. These projects, with their fellows, are listed below as they appear in the University Catalogue for 1909-10.

1. The Chemistry of Laundering. Five hundred dollars a year for two years, at the end of which time the value of the fellowship was doubled for several months. F. W. Faragher, A.B.

2. The Study of Diastase and the Manufacture of a Scientific Fodder. Five hundred dollars a year for three years. R. C. Sweeney, B.S.

3. The Chemistry of Bread. Five hundred dollars a year for two years. H. A. Kohman, A.B.

4. The Utilization of the Constituents of Waste Buttermilk from the Butter Factories. Five hundred dollars a year for two years. E. L. Tagge, A.B.

5. The Extraction of Utilizable Constituents from Crude Petroleum. One thousand dollars a year for two years. F. W. Bushong, Ph.D.

6. Improvements in Composition of Enamel for Enamel-Lined Steel Tanks. Thirteen hundred dollars a year for two years. Archie J. Weith, B.S., and Frank B. Brock, B.S.

7. The Relation Between the Optical Properties of Glass and Its Chemical Constitution. Fifteen hundred dollars a year for two years. E. Ward Tillotson, Ph.D.

8. Improvements in the Manufacture of Portland Cement and Lime. Fifteen hundred dollars a year for two years. J. F. MacKey, Ph.D.


10. An Investigation into the Chemical Treatment of Wood. Fifteen hundred dollars a year for two years. L. V. Redman, A.M.

11. The Discovery of New Utilities for Borax. Seven hundred and fifty dollars a year for one year. B. C. Fischel, B.S.

With nearly all these fellowships there goes a large additional consideration contingent upon success.

Some of these projects had been under way since January, 1907, and within two years, Duncan was able to make a report of progress (Journal Industrial and Engineering Chemistry, August, 1909; also March, 1911). These developments created an astonishing interest both at home and abroad (Harper's Weekly, Aug. 7, 1909; Journal Society of Chemical Industry, London, July 15, 1909). In the Harper's Weekly account, published in a popular journal of national circulation, the statement was made that Duncan's system "has suddenly given the University a reputation for energy and activity along modern lines of thought which other institutions might profitably emulate."

As a result of his writings and the wide publicity given the fellowships, Duncan found himself with offers from so many industries that laboratory space in Bailey Laboratory could not be provided for all. Then, too, most of the firms supporting the fellowships were in the East, although Duncan's efforts were followed by intense interest in Kansas itself; Governor Roscoe Stubs of Kansas, for example, contributed a thousand dollars toward the support of one of the fellowships.

The Mellon brothers of Pittsburgh, Pennsylvania, became interested in Duncan's work; in 1911, Duncan was invited to undertake a fellowship program at the University of Pittsburgh, and for two years he attempted to direct work at both institutions. In 1913, the Mellons had decided to establish a research institute on a permanent basis at Pittsburgh, and Duncan severed his connection with the University (Journal Industrial Engineering Chemistry, April, 1919). In the seven years in Bailey Laboratory some eighteen projects were undertaken on the Duncan program.

The importance of Duncan's work at the University has never been fully appreciated. In one of his papers (1911), Duncan relates that he secured with great difficulty the names and addresses of seventy-five corporations in the
United States possessing bureaus of research or individual research chemists. To these organizations he sent questionnaires inquiring into the conditions under which industrial research chemists labored. In the light of present practice, the results of this questionnaire are astounding. The replies indicated that there was no general practice; that employment conditions of chemists were chaotic, and often verged, as far as pay and service went, on those of a common laborer.

The efforts of Duncan begun in Bailey Laboratory were, I believe, one of the most important of the early contributing factors in the tremendous development in chemical industry and in conditions of chemist employment that have taken place in the last 45 years. Fortune (March, 1950) states that the chemical industry “must now be considered the premier industry of the United States.” Although the growth of the chemical industry has been greatly accelerated in recent years, Duncan’s insistence on the importance of research in industry, the use of his ability to write and speak and publicize his views, and his concern that the chemist receive a fair return for his knowledge, labor and ability, have played a leading and important part in these developments.

Probably the credit for giving Duncan the opportunity to carry out his experiment in industrial and university education should go in a large measure to Chancellor Frank Strong. With great insistence, Strong urged that the University, its faculty and its staff, should make every effort to be of service to the State; he was particularly interested in “practical” efforts in this direction. He had also known Duncan in his student days (rumor has it that Strong and Duncan sang in the same quartet in college), and when Duncan presented his plan it found favor in Strong’s eyes in more ways than one, with the result that Duncan came to Kansas and Bailey Laboratory.
Impact of World War I
1910-1920

As the above account suggests, Bailey Laboratory, by the end of its first decade of use, was an extremely busy place. The University, too, had made important progress during the decade, for the campus had expanded westward, and as the second decade began Dyche Museum, Green Hall, Robinson Gymnasium, Haworth Hall, Marvin Hall and a new power plant were in use—all buildings that were absent from the campus in 1900. In addition, work had begun on the east wing of the Administration building, now known as Strong Hall. University enrollments, too, had greatly increased, for by the end of 1910 the yearly enrollment was over two thousand students.

The chemistry staff in Bailey Laboratory as the fall of 1910 began consisted of Professor Bailey, Associate Professors Cady and Bushong, and Assistant Professors Allen, Jackson, Tague and Young. Professor Duncan had been relieved of teaching duties and had been given the title “director of industrial research.” In the School of Pharmacy the staff consisted of Professors Sayre and Havenhill and Assistant Professors Sterling, Emerson and Watson.

Dr. H. C. Allen began his continuous service in the chemistry department in 1910, although he had been on the campus during the previous decade both as student and staff member. In 1911, Associate Professor Dains, for some years on the Washburn College staff, was added as a member of the chemistry department. Assistant Professor Stratton, newly appointed with the doctorate, came the following year.

Dean Sayre had for some years taught courses in physiological chemistry to students of pharmacy and of medicine. As the medical curriculum expanded, still further need and emphasis was placed on these courses, and Assistant Professor Nelson came to Bailey Laboratory in 1913 to assume charge of the work in biochemistry. Until 1947, when biochemistry was moved to the Medical Science Building, Professor Nelson held forth in Bailey.

Duncan, as already pointed out, had severed all connections with the University after the summer of 1913, and the catalogue for 1913-14 lists no fellows in industrial research, although the six preceding catalogues had carried such lists.

Industrial research, however, was not completely abandoned after Duncan’s departure, as Associate Professor Whitaker was appointed director of the division of “State Chemical Research” the year that Duncan left. Upon Whitaker’s resignation in 1918, Professor Dains was placed in temporary charge for two years, and then Professor Allen became head of the division.

The greatest event of this decade in Bailey, however, was World War I and the effects which it produced on the University. The enrollment, which had been steadily climbing through the years, decreased as the fall of 1917 began. The previous year it had reached a high-water mark of over thirty-four hundred students, but the next year six hundred fewer students appeared, and women outnumbered men on the campus by three to one. Khaki tents, too, appeared on the campus late in the summer of 1917, for Co. M of the National Guard, “the University Company,” pitched their tents on the site now occupied by the central and west wings of Strong Hall.

The decreased enrollment, however, did not materially lessen the work of the members of the chemistry and pharmacy staffs. Professor Dains had many outside activities in directing non-military war work on the campus and he also served as adjutant for the War Department in locating technical personnel; Professor Whitaker was assigned tasks by the National Defense Council; Professor Bailey became chairman of the Douglas County Fuel Committee under the United States Fuel Administration; the Graduate Magazine was to report in a few months that “Captain George W. Stratton, who is in the chemical warfare service, has arrived safely overseas”; the most secret project under-
taken in Bailey Laboratory, in connection with war activities, however, was that directed by Professor Cady.

Dr. Cady was called to Washington in May, 1917, to attend a conference called by the Army and Navy which was attended by a number of scientific men as well as by the military of the United States and our Allies. In the course of the conference, Cady was requested to undertake the analysis of natural gas in the hope that important sources of helium for use in balloons could be found. On his return, Cady organized a staff consisting of C. W. Seibel, P. V. Faragher, F. W. Bruckmiller and Emily Berger, all of the chemistry department, and soon samples of gas collected by government agents came pouring in from wells in Kansas, Oklahoma, Texas, California, Ohio and Pennsylvania.

"For weeks Dr. Cady's laboratory in the chemistry building was the busiest place on the campus, although only a few faculty members knew the work that was going on" reports the Graduate Magazine at the time. All the early accounts of the work mention "argon" as the substance under investigation, but as Cady later pointed out (Industrial and Engineering Chemistry, August, 1938) that fiction was adopted to "fool" any German agents who might read about it. Cady and Seibel, too, participated in the work attendant upon the construction of a helium separation plant at Fort Worth.

Not only did the war bring changes in the activities of Bailey Laboratory, but other changes were taking place—changes that the passage of time would have brought about in any case. Professor Bailey reached the age of seventy years in the fall of 1918, for example, and on October 8, 1918, he voluntarily retired as chairman of the department. A week later he wrote Chancellor Strong:

Chancellor Frank Strong,  
University of Kansas.

Dear Doctor Strong:

In accordance with my communication to you on October 8th in reference to giving up the position of head of the Chemistry Department in the University of Kansas, the staff of the Chemistry Department held a meeting on Monday, October 15, in the Chemistry Building, and elected Doctor H. P. Cady to be acting head of the Department.

Respectfully submitted.

Professor Cady is accordingly listed as the chairman of the department in the University catalogue for 1918-19. For three years, however, annual elections for the chairmanship seem to have been held. The next University catalogue (that of 1919-20) designates no departmental chairman or head but in the spring of 1920, there appears in departmental files the annual budget letter of the department which is signed by Professor Bailey as "head" of the department. Another election was held in the spring of 1920, and resulted in the re-election of Professor Cady. Members of the staff of that day still recall that election as one member of the staff took it upon himself to canvass in favor of Dr. Dains as chairman. The result, although close, established Professor Cady in the position and the administration looked with favor on the department's choice. Professor Cady for some years had been Bailey's right-hand man, and as early as 1911 he had been appointed "acting director of the chemical laboratories" to serve in those periods when Professor Bailey was absent from the campus.

This period, too, marks Professor Brewster's appearance in Bailey Laboratory as assistant professor of chemistry. Appointed to the position in the fall of 1918, his actual appearance on the campus was delayed until February 1, 1919, as he remained in Chicago to do chemical research on war problems under Dr. Stieglitz. Brewster had, however, been a graduate student at the University as early as 1914.

If any present-day staff member, however, thinks that conditions have changed greatly in certain respects in Bailey Laboratory in the last thirty years, to learn otherwise he has only to read a mournful letter from Professor Whitaker to Professor Bailey written in the last year that Bailey was chairman. Whitaker, whose office was in the basement, wrote, "On the night of Feb. 27th my office and laboratory were flooded for the third time within a year by leaks coming from the floors above, which, in turn, were caused by gross carelessness on the part of someone." Whitaker then went on to enumerate eight items of damage and concluded with the parting shot that "the above statement does not include the damage caused by scores of similar leaks from the Organic laboratory. Hardly
Room 113, Bailey Laboratory. The photograph taken about 1916, shows Instructors Maag and Seibel and Assistant Professor P. V. Faragher in white jackets. Professor Cady is in the right foreground. It was in this laboratory that Franklin and Cady did their joint work on liquid ammonia; that helium was discovered in natural gas; and that the government project of World War I was carried out.
a week goes by that we do not suffer from leaks from this laboratory.”

The supposition that trials and tribulations in Bailey were not all physical is borne out by the reminiscences of Dr. L. V. Redman, one of the industrial fellows in Bailey in the decade under discussion. In a letter to Dr. Cady written in 1938 he stated that “the real fun I had [when at Kansas] was in listening to the war that went on between Dr. Dains and Professor Bushong. I never knew which of the two was right because I never had any very fundamental teaching in the very obscure organic chemistry, but one did not need to understand either Dr. Dains or Professor Bushong’s lectures. It was far more important to understand there was a battle. It generally ended with Professor Bushong starting down the stairs talking to himself telling Dr. Dains that he was all wrong and anybody that had any sense in organic chemistry ought to know better.”

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*To this item should be added student fees which probably approximated six thousand dollars.
An Era of Growth
1920-1930

Physically the University did not change greatly in appearance during the ten years between 1910 and 1920, but, following the close of World War I, came a great tide of students which seriously taxed the capacity and teaching staff of the University and the housing facilities of Lawrence.

The seriousness of the situation is clearly revealed in a letter written by the departmental chairman to the chancellor in submitting the preliminary chemistry budget for the year 1920-21. The letter reads in part:

With an increased attendance next year, we shall be absolutely unable to take care of more students. We have neither laboratory desks, nor instructional force to handle more students than we have done this year. In fact, the work has only been carried on at great personal sacrifice and by heavy overtime work on the part of many of the instructors. We were fortunate this year in having several fellows who chose to specialize in chemistry, and without this help, we should have been obliged to drop some of the work. We have no assurance that even this help will be afforded us next year.

Without any increase in students next year, we shall be obliged to limit the size of the classes, and as chemistry, in such courses as those in Engineering, Medicine and Pharmacy, is required, some of the college students will have to be denied the opportunity of taking the work and the classes will be closed when our limit is reached.

The budget itself called for an expenditure of some $38,000 for salaries and $2800 for laboratory supplies and equipment, and although this is in marked contrast to the budget of 1900, Chancellor Strong had been stressing in the several years prior to 1920 the need for marked increases in salaries because of the rising cost of living and the lure of much higher salaries in industry. As a matter of fact, the chemistry staff lost three assistant professors between 1918 and 1920 for this last reason.

The chemistry staff as this decade began (1920-21) consisted of Professors Bailey, Cady, Dains, Allen; Associate Professor Stratton; Assistant Professors Long, Brewster, Elsey, Werner, Wertheimer; and Instructors White, Jones, Buffetton, Asendorf, and Law. Instructor White had been added to the staff in 1918, and for twenty years, until his death on Sept. 18, 1938, he served as the loyal and likeable custodian of the department.

Assistant Professor Werner made his first appearance on the staff in the fall of 1920, and two years later, upon the resignation of Professor Long, was placed in charge of the State Food Laboratory.

The School of Pharmacy staff at the beginning of the decade included Professors Sayre and Havenhill and Assistant Professors Spencer and Sterling. Professor Spencer had returned to the University in 1919 after eighteen years spent in professional pharmacy. In biochemistry, the staff consisted of Professor Nelson and Instructor Kiefer.

As the enrollment mounted to a record number of 3367 students in the fall of 1920 (the total enrollment for the school year 1920-21 was 4226 according to the catalogue of that year), it became evident that an enlarged chemistry staff would be needed and the lack of laboratory space was proving a serious embarrassment to the department in its training of medical, engineering, and pharmacy students. As a result, Chairman Cady wrote an urgent letter to the budget committee pointing out these needs. As this is the first time that mention of a successor to Bailey Laboratory has been found, the letter is reprinted at some length.

One way of getting the necessary increase in laboratory space would be to put up a laboratory unit of a new chemistry building on a spot near enough to the present building so that both might be economically used. A unit of the size needed would, for a rough guess, cost about $100,000. If the building program does not include a new chemistry building at once, relief might be obtained by putting up a temporary building behind the present Chemistry Building. To take care of our needs for next year only, this should have capacity for at least three hundred students working in four sections. To provide for two or more years, the capacity should be double this, because as the higher classes increase, more elementary students must be moved from the old building to the temporary structure, and then, too, the elementary classes will grow. If it were thought best to
remodel and enlarge our present building instead of putting up a new one, a temporary building of six hundred student capacity would allow us to keep the work going until the changes were made on the old building, a wing at a time.

Mr. Shea says that a temporary wooden building will cost thirty-five cents per cubic foot. At this rate, a building 125 x 35 x 12 feet (at the eaves) will cost $23,000. The laboratory tables will cost about $6.00 per foot and there would be room for six hundred student places, fifteen tables, twenty feet long, making $1800 for the tables. Hence, the building and equipment would cost $25,000 to $30,000. A representative of the Truscon Steel Company of Youngstown, Ohio, called upon us and stated that while they had no building thirty-six feet wide they could furnish one forty feet wide and one hundred ten feet long which gives the necessary area, and that this building would cost, complete with wooden floor, somewhere between $7,500 and $8,000 and that it would have a salvage value of approximately fifty per cent of its cost. On the basis of these figures, the building completed and equipped should not cost much over ten thousand dollars, although probably twelve to fifteen thousand dollars would be a safer figure.

To make a building 125 x 35 take care of 600 students, we have planned four lockers per working space and this means that the laboratory work must be given in four sections which will require schedules to be changed so that laboratory work shall not come on the same days for all students, but that some will work Monday and Wednesday, others Tuesday and Thursday, and still others Friday and Saturday. This of course is a more efficient use of the space than having it stand idle so much of the time.

No immediate relief in laboratory space could be provided or suggested by a harassed administration which was beset on every side by demands for more instructors and more space, but Chancellor Lindley, who had succeeded Chancellor Strong in 1920, promised to consider the need for a new chemistry laboratory. Such a new building appears eighth on the list of needed buildings which Chancellor Lindley was to propose to the Legislature of 1925, but with no success (Graduate Magazine, January, 1925).

The chemistry staff, however, was expanded the following year (1921) by the addition of Assistant Professor Davidson and Instructor
Elvira Weeks, Associate Professor Kinney, in charge of courses in metallurgy, also became a member of the staff in 1921, replacing Assistant Professor Wertheimer, who had resigned. Additional teaching aid, too, was provided for the chemistry staff by increasing the number of assistant instructors, who had in the year 1919-1920 numbered but four.

Instructor Robert Taft joined the chemistry staff in the fall of 1922, but one of the most important events of this decade was the celebration of the completion of Professor Bailey’s forty years of service to the University. This event took place on September 21, 1923, and was attended by many former students of the chemistry department and by chemists from many neighboring institutions. Two addresses by former students were given in the afternoon and a formal dinner was held in the evening. Twenty-seven years ago I wrote for the Chemical Bulletin (December, 1923):

The celebration began Friday afternoon, September 21. Two addresses by former students of Doctor Bailey were given. Doctor Cady, the present chairman of the department, in introducing the speakers, said that in making plans for the celebration no more fitting method could be suggested than presenting for the occasion two of Doctor Bailey’s pupils as samples of his work in these past forty years. At this meeting Dr. E. C. Franklin, of the class of 1888, president of the American Chemical Society, introduced his address on “The Ammonia System of Compounds” by stating his own personal obligations and thanks to Doctor Bailey. He was followed on the program by Dr. E. V. McCollum, class of 1903, professor of biochemistry at Johns Hopkins University, who spoke on “The Present Status of the Science of Nutrition.” Doctor McCollum reviewed the recent work done on vitamins at Johns Hopkins University and elsewhere. Although both addresses were technical in nature and had been so announced, the chemistry lecture room, in which they were given, was crowded to its capacity. At the conclusion of the addresses the former students of Doctor Bailey who had gathered, greeted him personally expressing thanks for the training of bygone days, and congratulating him upon his notable achievement.

The formal dinner was a long affair but an interesting one, for many visiting colleagues from neighboring institutions, former students, Chancellor Lindley, former Chancellor Strong and Professor Bailey himself, spoke on that memorable occasion. Many of the former students and Professor Bailey gave reminiscences of an earlier day at the University, and those of the staff of 1950 who were there on that day twenty-seven years ago (five in number) gained a sense of continuity with the past, a sense of continuity that, coupled with their own experiences in the years elapsing since 1923, covers a space of two-thirds of a century, a goodly share of the entire University’s history of eighty-four years.

The Bailey celebration is described in greater detail in History of the Chemistry Department of the University of Kansas (Bulletin of the University of Kansas, Feb. 15, 1925) which was published as part of that celebration. The early years of the chemistry department (1866-1900) are accounted for in this booklet, and here may also be found considerable biographical information, lacking in the present account, concerning members of the staff in the period 1883-1923.

With an increasing number of graduate assistants in the department (ten in number by 1925) the number of graduate degrees in chemistry began to increase also. Some additional and greatly needed laboratory space was provided in 1924 by the removal of the chemical library from Bailey Laboratory to the newly completed Watson Library, the main University Library. Previous to 1924, the complete library of the department had been housed on the third floor of Bailey. The small working library at present in the basement of Bailey is of recent origin, as it was placed in use in the fall of 1947.

For many years the space in which this working library is now housed served as the liquid air room. It was in this room that the original liquid air plant had been installed in 1902, with results which had been so fruitful to the department. By 1923, however, the compressor had about reached the end of its life, and a new compressor-liquefier and auxiliary ammonia pre-cooler replaced it in 1924 (Graduate Magazine, December, 1924). The life of such a plant, judging by our experience at Kansas, would seem to be about twenty years. By the time that World War II was over, in 1945, the cost of maintenance and production on the compressor was so great that it could no longer compete with commercially available liquid air from a plant in Kansas City. The forty-odd years since the original liquefier was installed had thus seen the development of a new in-
dustry. The liquid air equipment was sold and removed from Bailey in the spring and summer of 1947, and the space it had occupied was thus made available for a small but much needed research library.

* * *

In many of the events which have occurred in Bailey Laboratory since 1922, I have taken part. In others, I have had second- or third-hand acquaintance with the facts. Of many others, when one considers the sum total of all events, I have no knowledge. This account, therefore, for over half of the period which it attempts to describe, is colored by my own experiences and my own reactions, and the reader should therefore be warned to be on his guard in accepting any observations which I may make as important, or any judgments as correct. It is possible, of course, that any coloring which I may inadvertently add will lend some interest to an otherwise drab recital of events.

One of the surprising—possibly astonishing—is the better word—facts, as the attempt is made to marshal the events of the past quarter-century or so in some sort of logical order, is the difficulty of recalling any events that are significant or important; or if any can be recalled, the question immediately arises, "When did that happen?" When I consult my older colleagues for suggestions or answers, their blank appearance or their wrong answers show that this failing—if it is a failing—is not confined to the writer alone.

Have we then accomplished nothing that is worthy of record? If the city or University newspapers are searched for aid in prodding the memory or filling the gaps of remembrance, the conclusion must be reached that a negative answer to this question is the correct one. Seldom is any happening in Bailey mentioned, or any activity of its individual inhabitants recorded. We are buoyed up with the belief, however, that our work, even though ordinarily unnoticed, is of some value. A glance at the varied and truly tremendous volume of the published contributions from this laboratory, given on subsequent pages of this brochure, will show at least that we have not been idle; whether or not these publications are important is another matter that only time can decide.

But these publications, and the toil, anxiety and care that gave rise to them, are only a minor part of our labors. The thousands of students who have passed through the halls of Bailey in the past fifty years have, after all, been our major responsibility. Our collective reputation as teachers, many competent and neutral observers have been kind enough to say, is considerable, and known the country over. If this statement seems immodest, let us hasten to add that any such reputation depends more upon our students than it does upon us. We have been fortunate in these fifty years in having students of marked capacity, and their reputation has added luster to Bailey Laboratory. Lest these statements seem too self-satisfied and mutually congratulatory, perhaps it should be added that we have also had students in considerable number upon whom our efforts seem to have been to no avail. If we assume credit for our successes, we must also accept blame for our failures—which have been all too many.

Not only in publication and in teaching do we have reason to feel that our efforts have been of value, but our activities are also mirrored in many connections with scientific and professional organizations. The Kansas City Section of the American Chemical Society, which was organized on Dec. 11, 1900, had as its first chairman Professor E. H. S. Bailey. In the fifty years which have elapsed since that time, members of the chemistry staff of Bailey Laboratory have played an active part in its affairs, and there is scarcely a staff member during this period who at some time or other has not served the organization in an official capacity. The national organization, too, has had among its officers a number of the chemistry staff of Bailey. Incidentally, as has been remarked elsewhere, there now hang in the halls of Bailey Laboratory the photographs of six past presidents of the American Chemical Society, all of whom were intimately associated in one way or another with the department (Journal Chemical Education, September, 1948).

With the Kansas Academy of Science, too, the staff members of Bailey have had very intimate association, as we have supplied one secretary, one editor, two treasurers and six presidents. Professor Cady, for example, was president of the organization in 1923-24, and a brief
account of the annual meeting at McPherson in April, 1924, will enable us to resume the chronological order of the history of Bailey Laboratory and its affairs.

An unusually large number of Bailey staff members attended that meeting; at least ten were there, and probably more. Most of the group drove to McPherson, leaving Lawrence on a cold, raw Thursday in April. All the cars driven were touring models; that is, they were equipped with more or less permanent tops but with adjustable side curtains. Even with the curtains up, the cold wind whistled through the cracks at a lively rate as to be uncomfortable for the passengers, especially those in the back seat. I rode in Cady's car, and had the honor and advantage of sitting with him in the front seat. When we reached McPherson, some 200 miles distant, we had virtually to roll out the occupants of the back seat, so numb and stiff were they. We stayed that night and the next, some dozen or fifteen of us, in a large home belonging to a relative of Professor Allen. The owners fortunately were away and we had the house to ourselves, but even so, one could find sleepers in every nook and cranny of the house.

On our second evening in McPherson, Professor Cady gave his presidential address at McPherson College on "Atomic Structure"; the college hall was crowded with members of the Academy and townspeople, for interest in atomic structure in 1924 had some of the same aspects as does the subject of nuclear energy today. Of the annual banquet that preceded Cady's address, the most notable feature, as I recall it after a lapse of many years, was a brief talk by Dr. D. W. Kurtz, president of McPherson College. Kurtz made a profound impression on his audience, for he was an able speaker and in the few moments that he talked showed that he had considerable knowledge of fundamental science and the scientific method, all the more remarkable for his being a clergyman. As we left the banquet Cady remarked, "That man would make an excellent chancellor of the University if we ever have need of another one soon."

In the two-day session we met and visited with many colleagues from other Kansas institutions and listened to numerous "papers" in many fields of science—for in those simple days the program was not sectionized. In fact, as I recall it, there was some discussion of sectionizing the meeting for the following year, a plan to which a number of members were opposed, especially Cady, who liked to listen to—and profited by—the discussions in other fields of science.

The return trip to Lawrence was begun on Saturday morning. The weather had greatly improved and it was warm and balmy. "Buck" White—that is, Professor White—had prevailed upon us to camp out that night, and so we did on the banks of the Neosho River some dozen miles south of Emporia. Cady and I were cooks for the evening meal, which meant that I did the work and Cady the directing. Frying sweet potatoes is the only cooking I can remember doing, and how many cans of that "fruit" we opened is recorded now only in the book of judgment. Anyhow, we must have satisfied the interior wants of that group of a dozen men for we spent a most pleasant and cheerful evening about the camp fire, chiefly listening to Cady and Werner swapping stories. By the time that the moon had waxed and we finally lay down to sleep, our belly muscles were sore from over-exertion.

The remainder of the return trip was made without notable incident, save that as we returned to the main highway over a rough and irregular road, "Buck" White, who was extremely hard of hearing but insisted on driving his own car, slowed very suddenly for a chuck-hole in the road. The car behind him, coming up rapidly and with no warning, rammed into White's car with a resounding crash. "My," said Buck to his companion as he drove on, "that was a worse rut than I thought it was."

These incidents of the McPherson meeting of over a quarter of a century ago have been told, not because they were important, but because they do have, I believe, some significance. They are significant in that they reveal a little of the detail of our past life, and of greater significance in that they show that comradeship and cooperation could at times be achieved among a group of individualists. Doubtless, too, some interested readers will have observed that our pleasures were simple then, as they of necessity had to be; for salaries in 1924, although considerably larger than in 1900, were still not conducive to riotous living. The
chairman of the department was then paid only a little over thirty-five hundred dollars a year, and from that munificent figure they dwindled down to eighteen hundred dollars for the lowest paid full-time instructor.

Cady’s candidacy of Kurtz for the chancellorship nearly had some chance of success in the fall after the McPherson meeting, as Chancellor Lindley was dismissed by Governor Davis on Dec. 27, 1924. This event, of political and personal origin, disrupted the life of the University, including that in Bailey Laboratory, for several weeks, and even after Lindley had been reinstated by Governor Paulen, Davis’s successor, in January of 1925, the uncertainties of politics in University affairs were matters of concern for a much longer time.

The year 1925, too, marks the promotion of Professor Havenhill to the deanship of the School of Pharmacy. Dean Sayre had died on July 20, 1925, and Chancellor Lindley, after consultation with staff members in Bailey and with his cabinet, appointed Havenhill as Sayre’s successor.

Two years after Dean Havenhill had assumed office, a change was made in the pharmacy curriculum. When the School of Pharmacy began its work in Bailey Laboratory, courses of two, three, and four years in pharmacy were offered. The degree of Pharmaceutical Chemist was given upon the satisfactory completion of the first two courses, and that of Bachelor of Science for the four-year course. In the early history of Bailey, the four-year course led to a combined degree with the School of Arts. Beginning in 1913, three degrees were offered for these courses: Graduate in Pharmacy for the two-year course, Pharmaceutical Chemist for the three, and Bachelor of Science for four years of work.

The two-year course was abandoned in 1927, and finally, to finish our summary of the evolution of the pharmacy degree, the three-year course was dropped in 1932. Graduates of the four-year course now receive the degree of Bachelor of Science in Pharmacy.

To conclude the list of changes taking place in Bailey in the 1920’s, we should mention that Albert Salisbury joined the storeroom force in 1926, and that Professor Werner became dean of men in 1929. Although Werner still continued as a member of the chemistry staff, most of his time was spent in the harassing tasks that beset the advisor to men. In 1947 he resigned these duties and, his sins forgiven, he was again received in Bailey Laboratory as a member in good standing.
The Depression Years
1930-1940

As one looks back upon the years of this decade, many of its happenings may be read as portents of great future tragedy. Like the approach of a sudden storm, the events were the warning roll of far-off thunder; but as in the approach of a storm there were moments also of quiet and tranquility. Economic disaster, drought, floods, dust storms of unprecedented magnitude, temperatures so high that none in the recorded history of Kansas approached them, were all to play their parts in University life and in the life of the workers in Bailey Laboratory.

As the decade began, however, there seemed to be no cause for alarm. True it was that late in the fall of 1929 there had occurred the New York stock market crash which many, even including a few of the staff in Bailey, cannot now recall without a sinking feeling in the pit of the stomach. On the lives of most of us, however, the financial crisis which resulted had little immediate effect. In fact, even the Federal Reserve Bank of Kansas City stated, in a report issued after the crash that “the activities of the stock market which have affected conditions in every part of the country have apparently done little damage in this district.”

Our salaries were even given slight raises in the school year 1930-31, and, as one surveyed the campus, financial disaster seemed indeed far away. The University had experienced in the decade of the 1920’s its greatest building period. The number of buildings on the campus was nearly doubled in these ten years, and some five million dollars had been spent. The main drive of the campus was paved and it had assumed much of the appearance with which we are familiar today.

The total enrollment, too, in the year 1930-31 reached an all-time high of practically 5900 students. The chemistry staff in Bailey, to teach these students as the decade began, consisted of Professors Bailey, Cady, Dains, Allen, Stratton and Brewster; Associate Professors Davidson, Kinney and Taft; Assistant Professors Gottlieb, Weeks, Werner, White and Jones, and thirteen assistant instructors. Professor Bailey, although his name is included in the official list, had virtually retired by this time and gave but a single lecture in toxicology a week; and Professors Gottlieb and Werner devoted only part of their time to instructional duties. It is of interest to note, too, that at this time the specialized courses in chemical engineering and metallurgy were administered by the chemistry department.

The staff of the School of Pharmacy as the decade began included Dean Havenhill; Associate Professors Spencer and Sterling; Instructor Boughton, and one assistant instructor. The department of biochemistry, which had been transferred from the Pharmacy School to the School of Medicine in 1919, also was housed in Bailey Laboratory and consisted of Professor Nelson, Instructor Stoker, and two assistant instructors.

As the first year of the decade passed, the great depression began slowly to creep upon us. Although faculty salaries remained unchanged for the school year 1931-32, enrollment fell off and many students still in school began looking frantically for part-time employment. Indeed, the situation in this respect became so serious in the immediately ensuing years that a national project, the College Students Employment Project (CSEP), was instituted on the campus in the spring of 1934 and gave part-time employment to some 350 University students, a number of whom were assigned a variety of tasks in Bailey Laboratory. The CSEP evolved in 1935 into the National Youth Administration, which continued its good offices to the advantage of many students until the beginning of World War II.

During the early years of the 1930’s, for some unknown reason I kept a diary. Many of the incidents recorded in these diaries have been completely forgotten, and even the most vigorous exploration in the labyrinths of memory fails to throw any better light of recognition on these incidents. In fact, as these diaries are read, many of the facts of every-day life appear in-
credible to me now. So foreign do they seem that I can nearly make myself believe that the record is that of another person, and I can read the daily entries almost with the objective dispassion of a neutral observer of the past scene. Under these circumstances, and in view of the fact that these records of life are not unusual but were typical of the younger staff members some twenty years ago, I know I shall be pardoned for quoting some of the material included in these diaries.

In the spring of 1932, for example, there are entries such as “Up at 6:10”; “Up at 5:30”; “Up at 5:40.” Good heavens, do people actually get up at these ungodly hours? Apparently I needed to, judging from each day’s activities, for in that spring, written comments indicate that I had under preparation talks to be given at Kansas City, at Manhattan, at McPherson, at Wichita and at a national meeting in New Orleans. These were professional addresses, too, and had to be prepared with care for fact and detail. Several manuscripts for professional journals were in course of preparation, the galley proof of one article was received and corrected, and work on a book was under way. Evenings apparently were occupied by reading and note taking, for record is made of books and articles read and abstracted. Occasionally there will be an entry, “Worked in the laboratory until 12 this evening helping Messmore with his thesis.” All of these activities, be it noted, were incidental to the main ones of teaching, directing research, and attending staff and committee meetings. The entries, too, “graded papers,” “graded reports,” occur with monotonous repetition, for in those days senior staff members graded all of their own papers and laboratory reports. What drives a man to work like that? It couldn’t have been money, for our salaries were decreasing and even the best that the University could afford were poor enough reward for any activity. It must have been the invigorating climate on top of Mount Oread, so efficacious in relieving asthma, and other complaints. But let me repeat again that my case was not unusual. I am sure that my colleagues both in the department and the University as a whole—oh, yes; there were some exceptions—were equally as industrious as I, and many must have been more so.

It is small wonder that with such concentration on our immediate tasks the coming depression cast so little shadow on us. Salaries were reduced by ten per cent in 1932-33 and by better than another ten per cent the following year, so that University salaries as a whole were not greatly above the distressingly low scale given for 1914-15. There is little in my written records, however, to indicate that these reductions greatly distressed us. Like death and taxes, the reduction seemed inevitable. Occasionally an entry in the diary such as “Did the family washing,” or “Cut the grass,” or “Planted roses,” suggests that money for outside help was not plentiful, but otherwise there is no comment on any reaction to the depression.

Once in a while, too, these written records will vividly recall some very pleasurable incident. A two-acre faculty garden at Professor White’s was a source of considerable enjoyment to a half-dozen of the staff members in Bailey in the spring of 1933; probably this project, too, was begun as an aid in combating the depression. Still more enjoyable to all members of the Bailey staff, as well as to their families, were the picnics held for many years in the late spring on the pleasant and commodious lawn at the home of Professor and Mrs. White near the western edge of town.

An earlier entry on March 19, 1931, recalls the fact that a number of staff members drove over to Manhattan to visit the members of the chemistry department at Kansas State College—a practice that has been continued until the present day in occasional exchange of visits, with a good deal of pleasure and profit to the members of both departments.

After the spring of 1933, my records were no longer kept; nor are there any departmental records which detail our life in this decade. Correspondence files, too, have largely disappeared, so that one must again fall back on the more impersonal catalogues and our less reliable collective memory to fill out the story of the remaining 1930’s.

It requires no diary, however, to recall the summer of 1934. The 69 students in chemistry and their three teachers—or for that matter the entire faculty and student body of some 1200 persons in the summer session of the University—breathed a sigh of relief when it was over.
With temperatures soaring to 100° and over day after day, it was a most trying time. I had a graduate student working on gels, and early that summer he reported that he couldn’t get his gels to set. As we had prepared them many times before without any trouble, we were puzzled at the difficulty until it finally dawned upon me that I should read the thermometer. The room temperature was 36° C, some ten degrees above the setting point; and such temperatures continued throughout the summer.

The summer of 1934 was followed in a few months by the great dust storms of March, 1935, when on one day, at least, one could stand in front of Bailey Laboratory and scarcely make out the outlines of Robinson Gymnasium across the street; and the following spring the dust was almost as bad.

During the first half of this decade, however, there occurred several other events that should be included in our account if the history of Bailey Laboratory and its workers is to be made anything like complete. It was in this period that the death of Professor Bailey occurred on June 1, 1933. He was the first of the old guard to pass on, but the year of his death marked the fiftieth year of his connection with the University. “He was a most genial, kindly man,” wrote Professor Cady later, “who never lost a chance to do or say something that would make someone else happier or more comfortable. These things were his joys in life. I don’t know how I could have got through the University if it had not been for Professor Bailey’s thoughtful kindness. Because he knew my funds were practically non-existent, whenever anything came in for analysis that was within my skill, he would turn it over to me with the excuse that he was too busy. He would, of course, supervise and check the work, and was most generous in giving me what he called my share of the proceeds. I think I often got the full returns and sometimes, I suspect, even more than he collected. It carried me along from month to month and in addition gave most valuable experience.”

In Professor Bailey’s honor, the building was officially named Bailey Chemical Laboratory by the Board of Regents in 1938. For most of its existence, however, the building has been carried in the University catalogues as the “Chemistry and Pharmacy Building”; to most students it was simply “the Chem Lab,” but by others it has been called by names that I would have difficulty getting past the board of censors if I wished to print them.

The most tragic personal event of the 1930’s in Bailey was the death of Dr. Ethel Ann Jones on June 10, 1936. Professor Jones, brooding over the death of her father and the serious illness of a sister, took her life by leaping from the Kansas River bridge. I had talked with her only a day or so before this tragedy, and although she expressed the opinion that she had more than her share of departmental work to do, there was no melancholia or despondency in her attitude. How little do we know each other!

Another development of this period which we should note began in 1930 when the department established a photographic laboratory in Room 114 of Bailey. The making of lantern slides, the photo-duplication of bibliographic material, and the facsimile reproduction of the results of investigations furnished ample work to warrant this effort. In 1931, Oren Bingham took charge of this laboratory, and it was not long before departments were bringing work to him in considerable volume. The laboratory remained for four years in Bailey, but in 1936 its work had expanded to such an extent that it was organized as the Photographic Bureau, an independent division of the University, and larger quarters were provided for its activities in the University Library.

The most important change of this decade, however, as far as the organization of the department of chemistry was concerned was the establishment of a separate department of chemical engineering as part of the School of Engineering and Architecture.

Ever since work in Bailey Laboratory began in 1900, a curriculum in chemical engineering had been offered. This course, leading to a Bachelor of Science degree, consisted of work drawn from general engineering courses, courses in the basic sciences and in English, and a few specialized courses in industrial chemistry taught by members of the chemistry department staff. For many years, Professor Allen served as the special adviser of these chemical engineering students. As the demands of the
times were calling for more and more specialization, the separate department was created in the summer of 1935. Associate Professor Kinney was appointed acting chairman of the department, and it included, in addition, Professor Allen, who divided his time between the two departments, and Assistant Professor Marshall. As then given, two options were offered in chemical engineering: one in chemistry and one in metallurgy. In the course of the next two years the laboratories for chemical engineering in the southwest corner of Bailey were re-equipped and greatly enlarged, a considerable share of the enlarging being accomplished by excavation of the basement. In 1938, Associate Professor Marshall became acting head of the department, and Professor Kinney was shifted to the department of mining and metallurgical engineering with laboratories in Haworth Hall, thus leaving Bailey after seventeen years of association with the chemistry department. Until 1946, chemical engineering laboratories were maintained in Bailey; they were then moved to Lindley Hall.

After 1935, times began to brighten again. The country was slowly recovering from its climatic and economic woes, and for the moment the staff in Bailey had some reason for cheer as salaries started their slow upward climb from the bottom of the pit.

As prospects improved for the faculty, so did they also for the students. The peak enrollment before World War II was reached in the fall of 1937, when some 4600 students were on the campus at one time (the total enrollment for the year was 5600). With the increased number of students, the problem of laboratory space became still more acute. The development of chemical engineering had not only taken some space from the chemistry department, but it also contributed to increased enrollments in the upper-class courses. To relieve this situation in some measure, the physical chemistry laboratory was enlarged and re-planned in the summer of 1938 so that its capacity was nearly doubled, and a consider-

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**Chemistry Enrollments 1900-1940**

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The data are not complete for all the years between 1900 and 1940, but it is sufficient to indicate general trends. For enrollment data for the period 1940-1950, see page 26.
ing. We do hope that in the near future our whole building will become in very truth the Bailey Chemical Laboratory. If the state will give us space to work in and a very modest support for the capable young men we can gather around us, we can safely promise very large dividends in the way of industrial developments for our state and country."

Echoes of Professor Whitaker's complaint of over twenty years earlier, also find their way into these annual reports. "Our balances for physical chemistry," wrote Professor Cady a year before the comment above was prepared, "must stand open on the desks exposed to fumes and the floods from the floors above, due to carelessness on the part of the students, or to the corrosion of the plumbing by the chemicals."

As the thirties drew toward their close, Professor E. A. White reached the retirement age of seventy in the summer of 1938. His death followed shortly, on Sept. 18, 1938. Professor White was succeeded by Ray W. Chiles, who for several years had been his understudy.

The last year of this decade brought an important change in University personnel, and a departmental celebration. On Sept. 22, 1939, Deane W. Malott, the successor to Dr. Lindley, was inaugurated as Chancellor of the University. In the fall of this year, too, Professor Cady began his fortieth year of service to the University. To celebrate the anniversary, an afternoon program and an evening banquet in Dr. Cady's honor were held on October 27. Many alumni and former students returned for the event. Among the notables who spoke at that time were Dr. Harvey Moyer of Ohio State University, Dr. C. M. Suter of Northwestern University, and Dr. Robert D. Cogbill of the United States Department of Agriculture, all alumni of the University of Kansas.
World War II and Its Aftermath
1940-1950

The years pass by. Sometimes with such slow and imperceptible motion that we scarcely note the current with which we move. But the storms of destiny can transform the tranquil picture almost over night; and all is changed and changed again.

So it was with the lives of workers in Bailey. The events which followed each other in rapid succession during the years between 1940 and 1950 gave rise to the ten years of greatest change in the half century that started in 1900. By 1940, Professor Cady was in his sixty-seventh year, two years past the retirement age of administrative officers, and he decided to give up the administration. He was succeeded in office by Professor Brewster on July 1, 1940. With the advent of Brewster as chairman, a new regime was begun. Regular staff meetings were held, minutes kept, and the policy and action of the staff decided by the group as a whole. The plan of departmental organization has been described elsewhere, however, and need not be repeated here (Journal Chemical Education, September, 1948).

The chemistry staff as the decade began included Professors Brewster, Cady, Dains, Allen, Stratton, Davidson and Taft; Associate Professors Werner and Weeks; Assistant Professor Rarick, and twenty assistant instructors.

In the School of Pharmacy, too, there were changes to be noted. Dean J. Allen Reese had succeeded Professor Havenhill upon his retirement from administrative duties in 1940, and the staff, in addition to Professors Reese and Havenhill, consisted of Professor Spencer, Assistant Professor Boughton, and two assistant instructors. Professor Sterling, after nearly forty years of service to the University, had died during the previous decade on Sept. 23, 1934.

But in addition to these two departments there must be included as residents of crowded Bailey Laboratory in the year beginning the nineteen forties, Professor Nelson, Assistant Professor Garber and Instructor Bunch in biochemistry and Professor Marshall, Assistant Professor Deschner and Instructor Spalding in chemical engineering.

The portents of the thirties, so dimly seen by some of us, were now becoming more readily discernible. Lt. John Poje, an assistant instructor of chemistry, was called to active duty in the summer of 1940, and by January 15, 1941, the problem of draft exemption for instructors had placed itself upon the records. As the full and savage fury of the storm finally reached us, this problem was to remain a recurrent and acute one for the next five years.

Professor Rarick resigned his position late in 1940, and during the spring semester of 1941 we were engaged in finding his successor, seeking at the same time a candidate for a newly created position in organic chemistry. Instructor Sisler was selected as Rarick's successor and Instructor VanderWerf as the staff addition. Both joined us in the fall of that year.

During the summer, Custodian Chiles left the department to join the navy, and the uncertainties of the times were further reflected in a very low summer school enrollment as only 72 chemistry students appeared.

The fall of 1941 marks the last appearance of Professor Dains as a teacher in Bailey Laboratory. Having suffered a paralytic stroke almost with the beginning of school in the fall, he never fully recovered. After some months, he began to make occasional visits to Bailey, and he was sufficiently improved by June 6, 1944, to attend an informal dinner, celebrating the completion of his thirty-third year of connection with the University. For a number of years his life as a semi-invalid was brightened by the occasional return of former students, whom he greatly delighted to see. His death occurred on Jan. 5, 1948. Like Professor Cady, Professor Dains left his mark on many activities of the department and added no small luster to its reputation. One of his lasting accomplishments was the development and expansion of a very excellent and extensive departmental library.
The morning of Dec. 8, 1941 found a large group of us gathered about a radio in room 308 of Bailey, then occupied as the State Food Laboratory. There we heard President Roosevelt’s address before Congress and his request for declarations of war against Japan and her allies; and the strain, exhaustion and effort of war were upon us. As we left the room after the conclusion of the broadcast, one of the younger men turned to me and said “How in the world did you know when World War I began? There was no radio in those days, was there?” In the twenty-odd years between wars, the radio had become so indispensable, a part of American life that it was difficult for the younger generation to visualize a world without it.

Probably the first effect brought by the declaration of war was the flood of questionnaires that soon began arriving. Questionnaires about the training that we could provide for chemists, questionnaires about our individual talents or services that might contribute to the war effort, and questionnaires from a variety of organizations requesting contribution of ideas that might be used in various aspects of war work. All were cheerfully and dutifully filled out, but I have often wondered if the great volume of material which must have been received by the agencies concerned was ever read.

As war got under way, the shortage of assistants began immediately to plague us. On our minutes of Feb. 5, 1942, I read recorded “the shortage of assistant instructors has compelled us to give each half-time assistant five three-hour laboratory periods instead of the standard assignment of four such periods. We must hire a number of seniors to read notebooks and grade daily problems, thus relieving the assistants of this much of their regular work.”

The shortage of assistant instructors was to become more and more severe as the war went on, and by May, 1944, only five assistant instructors were on duty. All of these worked long hours in the effort to keep our laboratories running, and they really deserve more than the brief mention which we can give them here.

Two other incidents occurring in the spring of 1942 are also worthy of note. In January of this year, the department received from Dr. Roy Cross of Kansas City a gift of four thousand dollars for the establishment of the H. P. Cady Fellowship Fund. This gift has been supplemented by contributions from many other alumni, and up to the present has enabled some four graduate students to qualify as Cady Fellows. The other incident mentioned above was the addition of Mrs. Wilma Collins to the department as secretary. Mrs. Collins began her work on June 1, 1942, following the resignation of her predecessor, Mrs. Catherine Major.

The work, strain and tension of the days during the early and most discouraging years of the War soon took their toll among the senior staff. In the fall of 1942, two of the staff suffered nervous breakdowns and another became ill, possibly because of the additional labor involved in taking over work previously done by his colleagues. Of these three illnesses the case of Professor Cady was by far the most serious, and it terminated eventually in his death on May 16, 1943.

During the fall of 1942, the department of chemistry was requested to undertake the training of two hundred girls to work in the laboratories of Sunflower Ordnance Plant, some dozen miles from Lawrence. The department outlined a course, and arranged publicity to secure persons interested in taking the course. A section of 24 girls was begun on Nov. 16 under Professor Brewster. A second section was scheduled to begin on Dec. 28, but as only two of the girls trained in the first section were employed by Sunflower, the project was abandoned.

During the same fall, funds became available from the Kansas Industrial Development Commission for chemical research on problems of state interest connected with the war effort. Studies were begun on carbon black, the chlorination of hydrocarbons, and synthetic rubber, chiefly under Professor Stratton. The continuation of this work gradually grew into the University of Kansas Research Foundation, which was officially established in May, 1943.

As 1943 got under way, plans for the proposed training of large groups of army engineering students were discussed. The army students did not materialize immediately, but by summer the Navy had its V1 and V12 programs under way at the University, a number of whom were enrolled in chemistry. The University went on a year-around schedule of six-
Beginning in the summer of 1943 several schedules were in operation continuously. On August 15, 1943, Professor Van de Werf, for example, was teaching classes in general chemistry and quantitative analysis to civilian students in the term beginning May 22, general chemistry to navy students in the term that began on July 5, and general chemistry to a group of army lads who enrolled on August 10.

ten-week trimesters, but with various military training programs under way which began at intervals differing from those of the regular terms, there was overlapping to such an extent that the University was in continual session. Vacations were limited to only a day or so, but some relief for instructors was secured by a program of staggered vacations.

The number of assistant instructors gradually decreased as more and more of the young men were called up for service in the armed forces, with a resulting increase in the labors of those remaining. Chemical seminar was abolished for the duration when it became evident that all the available time of the entire staff would be needed for instructional purposes.

With the beginning of the Army Student Training Program on Aug. 9, 1943, the University in reality assumed the appearance of an armed camp. The west wing of Strong Hall had been converted into barracks for navy mechanics trainees, but with these the Bailey staff had no direct contact. Lindley, newly constructed, served as barracks for army students. Uniforms were the common costume of the day on the campus, and the rhythmic tramp of many feet at drill the common sound.

For those who had early classes in the fall and winter of 1943, the day was long. Daylight saving was in effect the year around during the war years. Many a morning during the winter days of these years I hurriedly and dazedly made the bus in a darkness so black that it but added to the unreality of the situation. The bus reached the campus in time for its passengers to come to attention as the bugle sounded its call for the raising of the flag in front of Strong Hall.

With the resignation of Dr. Weeks in the spring of 1944, the staff was still further depleted, reaching its lowest number in many years; for this time only seven full-time staff members remained. Efforts were made to secure replacements during this period, but so great was the demand from many sources for trained men, that our efforts were unsuccessful.

Working, as we did, under the handicaps of insufficient help and long hours, it was some measure of consolation to learn in the fall of 1944 that the first section of army students, under the direction of Professor Stratton, placed third among 16 schools in a comprehensive cooperative test in general chemistry given at all 16 schools.

As the tide of battle turned, our eyes could be lifted for a moment, at least, toward the future. The inadequacy of Bailey Laboratory was daily becoming more obvious, and an ur-
A Pharmacy Class in Bailey Laboratory, 1903.

Dispensing Pharmacy Laboratory, 1942.
gent letter was sent to Chancellor Malott on March 1, 1945, calling his attention to this matter and requesting the consideration of a new building.

There appeared to be no immediate prospect of either sufficient funds or of building materials for the construction of a new building at the time. The administration, however, provided a temporary expedient by appropriating funds for redesigning and refitting the general chemistry laboratory, and for new furniture and equipment for research laboratories. Accordingly the large general laboratory on the third floor of Bailey was divided into four smaller laboratories which provided greater capacity and aided in securing greater teaching efficiency. The work of remodeling did not get under way, however, until the summer of 1946, but it was the following semester before the new furniture was all in use.

In the meantime, a number of changes had taken place in the personnel of the department. George King retired on Oct. 1, 1945, after fifty-five years with the department, and was succeeded as head storekeeper by Albert Salisbury. Mr. King's long service to the department had already been publicly recognized by a reception given by the staff in his honor in the lecture room of Bailey when his fiftieth year of service was reached. On that occasion, Mr. King was presented with a gold watch in token of the esteem and affection in which he was held, not only by the staff, but by the many generations of students he had served.

At the close of the war, plans which had been under way for some time, looking toward the enlargement of the staff, began to come to fruition. Assistant Professor Hume, as soon as he could be released from duties at Oak Ridge, joined the staff as Dr. Week's successor. He appeared for the spring semester of 1946, as the University, at the conclusion of war, had gone back to a semester basis. Assistant Professor Argersinger, too, was elected to the staff at this time, and began work in Bailey with the summer session of 1946. Professor Sisler's resignation in the same semester was followed by the election of Assistant Professor Kleinberg, who began his duties in the fall of the same year.

If the conclusion of war in 1945 left us all with a feeling of profound relief, the consequences of peace were more disturbing. A glance at the table below will give some understanding of the cause of this disturbance. The total chemistry enrollment in the fall of 1945, as can be seen, was about 450 students. The following spring it had doubled; but by the fall of 1946 we had five times the number of students to care for that we had had in the fall of 1945.

<table>
<thead>
<tr>
<th>Year</th>
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<tbody>
<tr>
<td>1940</td>
<td>670</td>
<td>611</td>
</tr>
<tr>
<td>1941</td>
<td>683</td>
<td>597</td>
</tr>
<tr>
<td>1942</td>
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<td>681</td>
</tr>
<tr>
<td>1943</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>1944</td>
<td>466*</td>
<td>356</td>
</tr>
<tr>
<td>1945</td>
<td>474</td>
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</tr>
<tr>
<td>1946</td>
<td>2121</td>
<td>997</td>
</tr>
<tr>
<td>1947</td>
<td>1733</td>
<td>1807</td>
</tr>
<tr>
<td>1948</td>
<td>1464</td>
<td>1464</td>
</tr>
</tbody>
</table>

*Winter quarters.

The upper set of figures for each semester represents undergraduate enrollment, the lower set, graduate enrollment.

Assistant instructors had to be found, more supplies and equipment had to be ordered and re-ordered again, new sections had to be added in almost every course, and class-room space in other buildings had to be provided for the overflowing sections.

Coincident, too, with the close of war began the accumulation of graduate fellowships and funds for research projects in unprecedented number and volume. Even in the days of Duncan the investigations under way could not compare in number to those undertaken in the years 1945-1950. Since 1945 fellowships and research projects in Bailey have been financed in chemistry and pharmaceutical chemistry by the Stanolind Oil and Gas Company, the Spencer Chemical Company, the Research Corporation of New York, the U.S. Public Health Service, the Office of Naval Research, the Atomic Energy
Room 113, Bailey Laboratory, 1948. Used for Physico-Chemical Measurements.

Commission, the Upjohn Company, Parke, Davis and Company, the American Foundation for Pharmaceutical Education, the Cady Fund, and by the University of Kansas itself. More recently fellowships have been provided by the Eastman Kodak Company and the E. I. du Pont de Nemours and Company.

At present some twenty students, two of whom are post-doctoral fellows, are at work with annual stipends ranging from $900 to $3600, figures which would have been incredible in pre-war days.

To provide additional laboratories for some of these fellows as well as for other graduate students, a quonset hut was built behind Bailey Laboratory in the spring of 1947. The “hut,” however, replaced the “shack,” a small temporary building that had been in use for several years as the quarters of two or three graduate students.

The staff, too, was further enlarged by the addition of Associate Professor Griswold and Assistant Professors McEwen and Gilles, who joined the department with the beginning of the fall semester in 1947. Assistant Professor Reynolds also came at this time, taking the place left vacant by the resignation of Dr. Hume.

In the School of Pharmacy, too, great changes occurred in the last five years of the half century. Professor Spencer retired in 1944 and the following year Professor Havenhill gave up his teaching duties. Associate Professor Burckhalter joined the staff in the fall of 1947, Assistant Professor Wenzel in the spring of 1948 and Assistant Professor Svoboda in the fall of 1949. These men, with Dean Reese and Instructors Beal and Ruchlen, comprise the faculty of the School of Pharmacy at present (spring, 1950).

With the advent of Professor Burckhalter, an extensive research program was initiated and laboratories for investigations in pharmaceutical chemistry were provided and equipped beginning with the summer of 1948.

War and its aftermath also affected greatly the enrollment in the School of Pharmacy as can be seen in the brief table above.

The chemistry staff as 1950 draws near to its half-way mark and Bailey Laboratory approaches its golden jubilee consists of Emeritus Professor Allen, who retired from active duty in June, 1946; Professors Brewster, Stratton, Davidson, Taft, VanderWerf; Associate Professors Werner, Griswold, Kleinberg and Argersinger; Assistant Professors Gilles, McEwen, and Reynolds; Custodian Lemmerson, who joined the staff in the spring of 1950; 39 assistant instructors, 14 fellows, three stenographers, four storeroom men, one glassblower and one mechanic. A far different staff indeed from that when Bailey was first used fifty years ago, when the department consisted of five teachers and Storekeeper George King!

But the most important event to happen in the decade of the nineteen-forties, as far as the life of Bailey Laboratory is concerned, was the appropriation by the 1949 Legislature of nearly two million dollars for a new science building. When it is completed within the next several years, life in Bailey will take a decidedly different trend. It will undoubtedly, however, continue its usefulness to the University and to the State—probably in such new ways that by the end of another fifty years the old life in Bailey will be all but forgotten.

* * *

As the foregoing pages are re-read, I am keenly aware that this account of fifty years in Bailey Laboratory is all too fragmentary and the facts of our story have been most unevenly woven into an incomplete tapestry of the past. In particular, too little has been said about the students, the very core of our existence. For what are a university and its departments without students?

It is difficult even to make an estimate of the total number of students who have worked, sweat, frolicked, praised and cursed instructors,
Chemistry Teaching and Service Staff, Spring of 1947. The Senior Staff members on the front row are (left to right): Professors Brewster, Taft, Stratton, Hume, Argersinger, Davidson, Kleinberg, Werner. Professor Allen was absent when the photograph was taken.

Compare this photograph with that of the staff three years earlier (see page 22).
and even on occasion perhaps cheated on examinations in Bailey. Perhaps thirty thousand—plus or minus ten thousand—would be a good guess. Each of these students would have a different story to tell of his experiences in Bailey Laboratory; and they have covered a wide range of experience and capacity. There was the young lady, for example, who was found in hysterics in the woman’s room by the departmental secretary. After she had been quieted down, it was found that her trouble arose from the consciousness that she had made “mistakes” on a newly completed examination. She had indeed made mistakes, for she received 96 on the examination rather than 100! Almost at the other extreme of capacity was the earnest but befuddled student in elementary chemistry who raised his hand during an examination and asked the instructor to explain a question. The question read, “Give concrete examples of common gases, liquids, and solids.” “Does that mean hard examples?” the student asked.

It is difficult to find any recorded statement of student feeling and opinion on Bailey and its staff. Not that many opinions have not been expressed in the fifty years now past, but most—fortunately—have not found their way into the black and white record.

Early in its career, however, “Bailey’s Barn” did find its written way into The Jayhawker, the student annual, and the student reporter who wrote the account noted that in the basement there was a “liquid air machine, and there is a hot air machine on every other floor. There is also a smelter in the basement, and a ‘squelecher’ on every other floor.”

It was at this time that Professor Cady was achieving his fearsome reputation as a severe taskmaster, and Chemistry 2, which he taught for many years, became known as “the white man’s burden.”

Probably the most astounding student story of all is that of an occurrence during prohibition days—and prohibition days have been long in Kansas. Professor Dains had a pair of students who were constantly engaged in distillation. When Dains would query them, their stock reply was always to the effect that they were recovering alcohol used in extraction. It is true that they were recovering alcohol, although not for strictly chemical purposes. Fortunately the good professor was spared the embarrassment of making the discovery of the true nature of the operations, for another instructor discovered the ulterior motive of these two sons of Bacchus, and their efforts came suddenly to a halt before the law and Professor Dains found it out.

Would that other student tales could be here told. Possibly these several will faintly suggest the trials, tribulations and escapades of Bailey’s numerous students. Their many ultimate successes belong to another story.

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**Chemistry Department Budget**

1949-1950

<table>
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<th>Item</th>
<th>Amount</th>
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<td>Senior staff salaries and service wages</td>
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<td>Graduate assistant salaries</td>
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<tr>
<td>Supplies and Equipment</td>
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<tr>
<td>Fellowships and Research Projects</td>
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<tr>
<td>(estimated)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$198,352</strong></td>
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</tbody>
</table>

The last item listed above is not completely under the control of the department or the University as some sponsors pay their fellowship holders directly.
Instructional and Research Staff in Bailey Chemical Laboratory
1900-1950

The data assembled below are taken directly from University catalogues which are not always consistent with themselves or with each other. No attempt has been made to collect the names of those below the rank of instructor, i.e., only full-time instructors have been included. The data given are inclusive of service in Bailey Laboratory only for the period 1900-1950. A number of staff members have longer University records than here given.

Department of Chemistry

ALLEN, H. C., Assistant Professor 1908-1909, 1910-1911; Associate Professor 1914-1919; Professor 1919-1946; Emeritus Professor 1946.

ARGERSINGER, WILLIAM J., JR., Assistant Professor 1941-1949; Associate Professor 1949.

ASENDORF, WILLIAM F., Instructor 1920-1922.

BAILEY, E. H. S., Professor 1900-1933.

BARTOW, EDWARD, Associate Professor 1909-1904.

BEATH, ORVILLE A., Instructor 1912-1914.

BERGER, EMILY V., Instructor 1917-1920.

BRAGG, GILBERT A., Instructor 1912-1913.

BREWSTER, RAY C., Assistant Professor 1918-1921; Associate Professor 1921-1927; Professor 1927-

BROCK, FRANK F., Instructor 1911-1913.

BRODERSON, HENRY J., Instructor 1909-1911.

BRUCKMILLER, FRED W., Assistant Professor 1913-1918.

BUFFINGTON, R. M., Instructor 1919-1921.

BUSHONG, F. W., Assistant Professor 1905-1910; Associate Professor 1910-1913.

CADY, HAMILTON F., Assistant Professor 1900-1905; Associate Professor 1905-1911; Professor 1911-1943.

CHALLIS, JOHN V., Instructor 1919-1920.

CURTIS, ROBERT W., Assistant Professor 1904-1907.

DAINS, FRANK B., Associate Professor 1911-1914; Professor 1914-1948.

DAVIDSON, ARTHUR W., Assistant Professor 1921-1927; Associate Professor 1927-1937; Professor 1937-

DUNCAN, ROBERT K., Professor 1906-1913.

ELSEY, HOWARD M., Assistant Professor 1918-1921; Associate Professor 1921-1925.

ESTES, CLARENCE, Assistant Professor 1914-1915; Instructor 1916-1917; Assistant Professor 1917-1920.

FARAGHER, PAUL V., Instructor 1909-1910; Assistant Professor 1913-1918; Associate Professor 1918-1919.

FRANKLIN, EDWARD C., Professor 1900-1903.

GILLES, PAUL W., Assistant Professor 1947-

GOTTLEB, SELMA, Instructor 1923-1924; Assistant Professor 1924-1935.

GRIFFIN, EDWARD L., Instructor 1911-1913.

GRISWOLD, ERNEST, Associate Professor 1947-

GROENING, THEODORE, Instructor 1925-1926.

HARDER, EDWARD H., Assistant Professor 1911-1913.

HEDGER, FLORENCE, Instructor 1908-1911.

HUME, DAVID N., Assistant Professor 1946-1947.

HUMPHREY, IRVIN W., Instructor 1911-1913.

JACKSON, H. L., Assistant Professor 1906-1913.

JONES, ETHEL A., Instructor 1920-1921, 1924-1930; Assistant Professor 1930-1936.

KINNEY, E. D., Associate Professor 1921-1935.

KLEINBERG, JACOB, Assistant Professor 1946-1948; Associate Professor 1948-

LANDRUM, ROBERT D., Assistant Professor 1907-1909.

LANGE, WILLIAM F., Instructor 1918-1919.

LATIMER, WENDELL M., Instructor 1914-1917.

LAW, SEATON M., Instructor 1920-1921.

LEMMERMAN, LEO V., Instructor 1950.

LICHTENWALTER, HOMER O., Instructor 1912-1916.

LONG, WALTER S., Assistant Professor 1913-1921.

McEWEN, WILLIAM E., Assistant Professor 1947-

McFARLAND, DAVID F., Instructor 1900-1902; Assistant Professor 1903-1908.

MACINNON, JEAN, Instructor 1911-1912.

MAAG, OSCAR L., Instructor 1915-1917.

MACKÉY, J. F., Assistant Professor 1909-1911.

MECKLIN, FRED J., Assistant Professor 1920-1921.

MERRIN, RUTH, Instructor 1921-1922.

MURRAY, AGNES A., Instructor 1917-1920.

NASH, CLARENCE A., Instructor 1910-1912.

PARKHURST, IVAN P., Instructor 1914-1917.

RADER, AMY V. H., Instructor 1918-1919.

RAMSAY, JAMES B., Instructor 1917-1918, 1919-1920.

RANSKILL, EUGENE, Instructor 1937-1938.

RARIK, MORGAN, Instructor 1936-1937, 1938-1940; Assistant Professor 1940-1941.

REDMAN, L. V., Assistant Professor 1910-1913.

REYNOLDS, CHARLES A., Assistant Professor 1947-

RODEBUSH, WORTH H., Instructor 1912-1915.

ROSE, R. P., Instructor 1912-1913.

ROWLAND, FLOYD E., Assistant Professor 1918-1920.

RUPERT, FRANK, Instructor 1907-1912.

SEIBEL, CLIFFORD W., Instructor 1915-1918.

SISLER, HARRY H., Instructor 1941-1942; Assistant Professor 1942-1945; Associate Professor 1945-1946.

STRATTON, GEORGE W., Assistant Professor 1912-1918; Associate Professor 1918-1923; Professor 1923-

TAPT, ROBERT, Instructor 1922-1924, 1925-1926; Associate Professor 1926-1928; Associate Professor 1928-1937; Professor 1937-

TAGUÉ, EDGAR L., Assistant Professor 1910-1912.

TILLITTSON, EDWARD, Assistant Professor 1909-1913.

TRICKEY, JOHN P., Assistant Professor 1910-1912.

VANDERWERF, C. A., Instructor 1941-1942; Assistant Professor 1942-1945; Associate Professor 1945-1949; Professor 1949.
Vawter, Elbert V., Instructor 1911-1913.
Weeks, Mary E., Instructor 1921-1927; Assistant Professor 1921-1937; Associate Professor 1937-1944.
Weidlein, Edward R., Instructor 1910-1912.
Weith, Archie J., Instructor 1911-1912; Assistant Professor 1912-1913.
Werner, Henry, Assistant Professor 1920-1934; Associate Professor 1934-.
Wertheim, Edgar, Assistant Professor 1918-1920.
Wertzheimer, Joseph, Assistant Professor 1920-1921.
Whelan, John B., Instructor 1913-1917.
Whitaker, W. R., Associate Professor 1911-1916; Professor 1916-1918.
White, E. A., Instructor 1918-1921; Assistant Professor 1921-1928.
Williams, Elrick, Assistant Professor 1913-1914.
Wilson, Stanley D., Instructor 1911-1912.
Young, C. C., Instructor 1910-1911; Assistant Professor 1911-1917.

School of Pharmacy
Anderson, Ruth E., Instructor 1945 (spring).
Blair, Frances I., Instructor 1945-1948.
Booughton, Lloyd L., Instructor 1926-1933; Assistant Professor 1933-1941; Associate Professor 1941-1943.
Bowers, Roy A., Assistant Professor 1941-1943; Associate Professor 1943-1945.
Brodie, Donald C., Associate Professor 1945-1947.
Burckhalter, Joseph H., Associate Professor 1947-.
Clark, Ralph W., Professor 1946-1949.
Emerson, Herbert W., Instructor 1903-1905; Assistant Professor 1906-1914.
Havenhill, L. D., Assistant Professor 1900-1906; Associate Professor 1906-1908; Professor 1908-1945; Emeritus Professor 1945-.
Nelson, C. F., Assistant Professor 1913-1914; Associate Professor 1914-1917; Professor 1917-1919.
Osborne, George E., Instructor 1946 (spring).
Reese, J. Allen, Professor 1940-.
Rottluff, Karl M., Assistant Professor 1922-1928.
Ruehlen, Dallas W., Instructor 1949-1950.
Sayre, Lucius E., Professor 1900-1925.
Spencer, Daniel H., Assistant Professor 1919-1926; Associate Professor 1926-1937; Professor 1937-1944; Emeritus Professor 1944-April 7, 1949.
Sterling, Charles M., Assistant Professor 1901-1926; Associate Professor 1926-1933.
Svoboda, Gordon H., Assistant Professor 1949-.
Watson, George N., Instructor 1909-1910; Assistant Professor 1910-1922.
Wenzel, Duane G., Assistant Professor 1948-.
Williams, James L., Instructor 1916-1917.
Zieffle, Adolph, Assistant Professor 1907-1909.

Biochemistry
1919 - 1947
Bunch, Leitha, Instructor 1937-1941.
Cutler, Irene, Instructor 1926-1927.
Eckelberry, Orin S., Instructor 1923-1924.
Garber, Pauline, Assistant Professor, 1940-1943.
Kaiser, Margaret, Instructor 1938-1939.
Kiefer, Everett D., Instructor 1920-1922.
Kinney, Ethel M., Assistant Professor 1924-1926.
Klopper, Isabel, Instructor 1935-1940.
Lehnherr, Earl R., Instructor 1926-1928.
Mills, Russell C., Assistant Professor 1946-1947.
Stoker, Ruth, Instructor 1927-1937, 1942 (spring).
Strem, Carl, E. S., Instructor 1920 (spring).

Chemical Engineering
1935 - 1946
Castonguay, Thomas T., Instructor 1941-1942; Assistant Professor 1942-1945; Associate Professor 1945-1946.
Deschner, W. W., Assistant Professor 1938-1942.
Hawkins, Harold M., Instructor 1941-1942.
Hutcheson, J. D., Instructor 1937-1938.
Kinney, E. D., Associate Professor 1913-1937.
Marshall, T. H., Assistant Professor 1935-1936; Associate Professor 1936-1939; Professor 1939-1941.
Spalding, Donald A., Instructor 1939-1941.
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1900-1950

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MURRAY, AGNES A.


PORTER, FRED B.


REDMAN, L. V.


REYNOLDS, C. A.


RUPERT, F. F.


SISLER, HARRY H.


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BLAIR, FRANCES


BOUGHTON, LLOYD L.


BOWERS, R. A.


BRODE, DONALD C.


BURCKHALTER, JOSEPH H.


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SAYRE, LUCIUS E.


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