

*A Sesquicentennial Historical Pamphlet*



**CHEMISTRY AT DEPAUW UNIVERSITY**

**1837-1987**

## Foreword

I had always planned upon retirement to write a history of DePauw's Department of Chemistry. The celebration of the Sesquicentennial presented a unique occasion.

The following is by no means a complete history of this distinguished Department, and I apologize for its inadequacies. At some later date a complete history should be written which could include much that could not be presented in this small booklet.

Old Minshall Laboratory played a most definitive role in the Chemistry Department's outstanding contribution to the life stream of our nation. It is my hope that the place on which she stood may some day be marked with a suitable plaque, on which could be inscribed:

On this site once stood Minshall Laboratory (1902-1973). Through her doors walked DePauw men and women who went forth to enrich the world.

I believe these few words say it all, and are a lasting tribute to all those who in large or small measure have given of themselves far beyond the borders of the DePauw campus.

Donald J. Cook, Ph.D.  
Professor Emeritus of Chemistry  
September 1, 1986

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*Editors Note: This booklet was originally published and circulated to alumni in 1987. Jack has graciously agreed to have it put up on the web, and Wes Wilson of the DePauw Archives provided some of the photos that have been added to the web version. I have added a small update at the end of the booklet; otherwise it is word-for-word Jack's original document. Ms. Robin DiRocco scanned and prepared the manuscript for the web.*

*Prof. Bryan Hanson  
Chair  
January 2001*

# CHEMISTRY AT DEPAUW UNIVERSITY

## The Asbury Years

From the beginning chemistry has been a part of the Asbury-DePauw curriculum. According to the 1839 catalog chemistry was offered in the junior year during the second semester and was taught as one of the natural science courses. The instructor was President Matthew Simpson, who was also Professor of Mathematics and Natural Science. He used Turner's textbook (as listed in the catalog) and had two students in this class, T. A. Goodson, of Brookville, Indiana, and C. G. Downey, of New Albany, Indiana. President Simpson's qualifications for teaching chemistry were not without merit for these times, since he had completed medical training in Freeport, Ohio, under Dr. John McBean. Under President Simpson's guidance there were early efforts to obtain funds from the Methodists of the state to purchase "philosophical equipment" and library volumes. One of the chemistry classics which was undoubtedly used as reference for this first chemistry class is now in the collection of the DePauw Archives. It is a four-volume set entitled A System of Chemistry, by Dr. Thomas Thomson, with notes by Thomas Cooper and published by Abraham Small of Philadelphia in 1818. Recorded in each volume is the note in script, "Indiana Asbury University, September 15<sup>th</sup>. 1839."

Of the two junior students, Charles Gibbs Downey within a few years would play a significant role at Indiana Asbury University as Professor of Natural Science. After his junior year at Asbury he traveled east to complete his college studies at Wesleyan University in Connecticut, graduating in 1840. He then returned to Asbury as an Instructor in Mathematics.

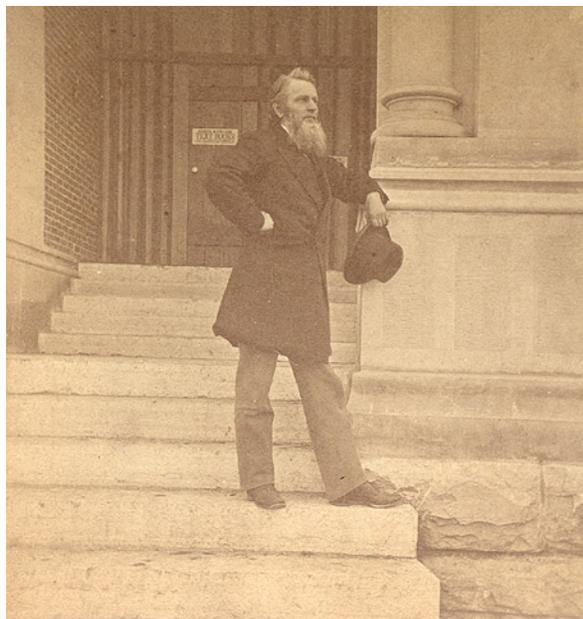
In this same year President Simpson met William C. Larrabee at a Methodist General Conference in Baltimore and offered him the Chair of Professor of Mathematics and Natural Science, an appointment which was confirmed by the Board of Trustees on September 14, 1840. Professor Larrabee, a graduate of Bowdoin College in 1828, began his association with Asbury in 1841 and in his first year taught the courses in natural science, which included chemistry. Larrabee brought to Asbury the expertise of an experienced teacher, which in many ways would set the tone for the developing science curriculum. He contributed his extensive collection of minerals to the limited scientific equipment which was described for the first time in the 1840 catalog as follows:

The trustees have succeeded in procuring a small philosophical and chemical apparatus cabinet which, though not extensive, is sufficient for illustrating by interesting experiments, the more important principles of philosophy and chemistry.

If succeeding catalogs are any indication of the scientific equipment available at Asbury, this situation did not change for years.

In 1842 Charles Downey, who had completed his first year as Instructor in Mathematics, now took over one half of Larrabee's duties and became Professor of

Natural Science, leaving Larrabee as the Professor of Mathematics. Under Professor Downey, chemistry was offered during the first session of the senior year and continued so until 1845, when a change to the quarter system placed chemistry in the first and second terms of the junior year.



Joseph Tingley

This curriculum continued until 1849, when Joseph Tingley, an Asbury graduate of 1846, who had served on the staff as a tutor for three years, was made Professor of Natural Science. With this appointment, Joseph Tingley, a cousin of President Simpson, would remain at Asbury for another thirty years. His career was illustrious, but ended with frustration and disappointment.

Charles Downey was transferred to the newly established Indiana Central Medical College (located in Indianapolis), a school within Indiana Asbury University. He was named Professor of Chemistry and Pharmacy, and it might be assumed that this was not the first appointment in chemistry. However, it was not an appointment within a Department of Chemistry of Indiana Asbury. This would come later. The

decision for Asbury to establish the School of Medicine was based on a recognized lack of medical training in the Old Northwest and a determination by Indiana Methodists, as reported in 1849 in the Western Christian Advocate, to “inculcate the great principles of Christianity, so far as pertains to their connection with medical science.” Professor Downey continued in this appointment for three years, during which time over one hundred students attended the school. Of the forty graduates, many served as surgeons during the Civil War. One alumnus, Joshua T. Belles, became the grandfather of former British Prime Minister Harold Macmillan.

Although the medical school was a good one and did fill a desperate need in Indiana, financial problems and the lack of facilities in Indianapolis resulted in the closing of the college in 1852. Professor Downey was transferred back to Asbury in Greencastle, taking over the chair of Professor of Mathematics recently vacated by the resignation of Professor Larrabee. Joseph Tingley remained as Professor of Natural Science.

Downey and Tingley became the science and mathematics team for the next five years. They were both enthusiastic and were top caliber teachers with the added talents of mechanical skill and ability to construct laboratory apparatus. According to a student journal, (Asbury Review, April, 1876) Asbury in twenty seven years spent \$1,500 for natural science equipment when rival colleges were spending as much as \$100,000. The article continued, “Notwithstanding this humiliating fact, there is probably no institution in the West where the experimental sciences are more successfully taught or where a greater variety of scientific demonstrations are

employed." At this early date it was evident that Asbury was endowed with science teachers of unusual ability.

Professor Downey continued at Asbury until July 1, 1857, when he retired because of ill health. During the summer he accepted the Chair of Professor of Natural Science at Iowa Wesleyan in Mount Pleasant and moved to Iowa, hoping his health would improve. But his illness worsened, making it necessary for him and his family to return to his family home in Indianapolis, where he died at the age of 38 years on October 9, 1857. His wife Hester and two small daughters, Alice and Anna, survived him. Both daughters were graduated from Asbury and later became women of distinction.

But to return to Joseph Tingley, who continued as Professor of Natural Science at Indiana Asbury. In 1858 he was using a chemistry book by Stockhardt (no other names available) and for the first time the reference "Chemical Analysis," by Fresenius, is mentioned. Tingley's academic stature continued to be recognized when he was made vice-president in 1860 and acting president for six months in 1864, when President Bowman was called to Washington, D.C. The description in the catalog in 1867-68, written by Professor Tingley describing the Asbury offering in the natural sciences, contained this bit about chemistry:

The student in chemistry is first made familiar with the properties, names, and symbols of the elements, and with the general principles and laws of the science, by lectures, a full course of experiments, and the use of the text-book. He is then at once put to work at the table of the analytical laboratory and is required to complete a practical course of qualitative analysis, during which some attention is given to the study of quantitative analysis.

During this era all the Asbury students were required to study these two terms of chemistry as just described.

The regard for Professor Tingley by his students is expressed in the diary of an Asbury student, Samuel P. Reid, on January 6, 1862. He found Professor Tingley a most exciting person and wrote, "I went out from his presence, having found him to be a real honest, sensible, civilized being." Samuel Reid was killed in a battle of the Civil War before the end of the year. In 1871 by a vote of the Asbury faculty and with the concurrence of the Board of Trustees, Joseph Tingley was given an honorary Ph.D. by Indiana Asbury University. He was highly respected by all. His services to the church and to the community, his contribution to the temperance movement, his outstanding abilities as a lecturer in science and in the pulpit, and his stature as one of the leading scientists in the state made him a most valuable professor at Indiana Asbury. Indeed he was, until for some unrecorded reason he incurred the displeasure of the president and the members of the Board of Trustees in 1879 and after 31 years of dedicated service to Asbury was discharged. The reasons for this action are lost in time and memory. Even an appeal from his cousin, Bishop Matthew Simpson, did not alter the "righteous" decision of the Board. Bishop Simpson noted that Tingley "graduated under my care, a good student, and especially fond of experimental science. His life has been devoted to it. Few men in this country have in that department larger knowledge or greater skill."

So by an administrative decision, which was highly criticized by faculty, students and townspeople, Asbury lost one of its great professors. Joseph Tingley never overcame the trauma of his dismissal. He died in 1892 in Holton, Kansas. It was his wish to return to Greencastle, and he is buried in Forest Hill Cemetery, which he had surveyed in 1855. Later, in belated tribute, one room in East College was designated as Joseph Tingley Hall and was furnished by C. W. Smith, an 1867 graduate. Later renovations eliminated this room, but his portrait hangs in the first-floor corridor.

Prior to the dismissal of Professor Tingley, Philip Schaffner Baker, a graduate of Asbury in 1874 with a 99.91 academic average, was made an Instructor of Natural Science and English in the fall of that year. In the 1874-75 academic year Tingley and Baker shared the course load in the sciences, with Baker teaching chemistry to the sophomore students. In the first and second terms the courses were based on lectures and reading of the textbook (the authors were Kemshead and Roscoe), but the third term was specifically designated as Laboratory Practice Analytical Chemistry. In 1874, for the first time at Indiana Asbury University, a full laboratory course in chemistry was offered.

During the next four years Baker continued as an instructor. He was elected assistant treasurer of the faculty, and he presented his first convocation lecture in 1876 on "William Ellery Channing," Unitarian leader of the day. While he served as an instructor at Asbury, he also attended the Indiana Medical College and earned the M.D. degree in 1879. In 1880 Dr. Baker was made Adjunct Professor in Science and in 1882 became Professor of Chemistry and Physiology. In the 1880-81 catalog the department of "Natural Science-Chemistry" first appears with "Phillip S. Baker, M.D., Acting" as the head of the department. In the next catalog (1881-82) chemistry is listed as a distinct department with Dr. Baker in charge, plus an assistant, William H. Charles. In 1884 Baker was made the first full Professor of Chemistry and Head of the Department.

In the late 1870's and early 1880's many changes occurred in the sciences. In 1875 there was established at Asbury the Indiana Scientific Association. Its purpose was to further the study of natural history in the state and to subscribe to the leading scientific journals of the world. New instruments and equipment were acquired, including a gift from Indiana Governor Will Cumbback of a Becker and Son's Analytical Balance sensitive to "I-20 Mgm," with a full load of 100 gms. The cost of balance and weights was \$113.00. In the fire of 1879, which destroyed West College, much of the apparatus and the scientific equipment was lost; but a portion of the minerals and the library collection of the Scientific Club was saved, because it was now in the "new building" (East College).

Under the guidance of Professor Baker the new Department of Chemistry in 1882 offered Inorganic and Organic Qualitative Analysis the freshman year, Inorganic Quantitative Analysis the sophomore year, Organic Analysis the junior year, and two terms of Original Work in the senior year. In 1881, for the first time, there was a chemistry course with the title, Organic Qualitative Analysis. The catalog describes the work as follows:

The recitation and laboratory practice will require two hours a day, with one and a quarter hours in the laboratory. The rooms will be open from

8:00 a.m. to 5:00 p.m. to accommodate students who desire to do extra work or who may not be able to present themselves during class hours.

From the inception of the Department, chemistry has always been a laboratory-oriented subject. By 1882 the Asbury Chemistry Department was well established, and the newly named DePauw University would continue a renewed emphasis on chemical education.

#### PHILIP S. BAKER — CHEMISTRY — AND DEPAUW



Philip S. Baker in 1874

The Department of Chemistry was two years old when Asbury became DePauw in 1884 and Philip S. Baker became the first Professor of Chemistry. Great plans were made for the new DePauw University. Although new schools were to be organized around the Asbury College of Liberal Arts, the concern for the sciences was in fact minimal; and these departments were still left with inadequate facilities. Under Dr. Baker the Chemistry Department by 1884 was located in the basement of East College and would remain there for another 19 years. In 1890, according to the catalog, the laboratories were "Well equipped with gas, water, chemicals and apparatus, four delicate balances and iron, porcelain and platinum ware." There were also an electrical

battery, large coil, several pieces of Hofman's Apparatus, a collection of rare elements, sets of crystal models in wood and glass, typical minerals and a complete set of "gas apparatus." DePauw still had little sophisticated equipment.

In a few short years the fledgling science of chemistry began to attract students to its call. By 1890 Dr. Baker had eight advanced students reporting on journal papers describing topics, such as "Baking Powders," "Illuminating Gas," "Glass," "Ozone," "Sulfate of Iron and Inks," "The Benzene Theory," "Petroleum," and "Aluminum." In the decade of the 80's his life was indeed full. In 1881 he married Miss Luemma A. Allen of Putnam County, a junior in the University. They were to enjoy the next twenty years together. He spent one semester at Harvard (1882-83) under J. P. Cooke, studying Quantitative Analysis and Mineralogy. In 1887 the Board of Trustees gave him a year and one half leave of absence (without pay) to study with Ira Remsen at Johns Hopkins (1888-89). During this time he authored a "Historical Sketch of Vapor Densities of Volatile Metallic Salts" and a "Historical Sketch of Perkins Synthesis." He also lectured at The Indiana Medical College in Indianapolis, where he had received the M.D. degree in 1879. A son, Ross Allen Baker, was born in 1886. He too would become a chemist and an illustrious professor.

During the 1880's and 90's Dr. Baker began to gather about him in East College a number of young, eager students. In 1883 F. O. Cuninghame won second class honors in chemistry and physiology. In 1884-85 laboratory assistants were M. M. Bachelder and Charles W. Farr (who would later become Professor of Natural Science at Southwest

Kansas College). We now can see the beginning of a major in chemistry starting to develop. By 1896 a major required nine courses in chemistry, covering General Chemistry, Analytical, and the Carbon Compounds (Dr. Baker did not believe the term Organic Chemistry was correct). A major would require six semesters of work, but according to the catalog, "A competent student will be able to follow his major as far as possible." In 1886-87 H. V. Nixon served as assistant in the laboratory, while in 1887-88 Wellington B. Johnson was an instructor and John L. Jackson was an assistant. In the year 1888-89 Thomas C. Hopkins was the replacement instructor in chemistry while Dr. Baker was on leave at Johns Hopkins. In 1894-96 a young Greencastle boy, George A. Abbott, who would become one of the first recipients of a Ph.D. from Massachusetts Institute of Technology, assisted Dr. Baker in the organic laboratory. As noted in the catalog, here they did "preparations and testing of marsh gas, chloroform, ether, alcohol, glycerine, glucose, benzene, some of the aniline dyes, carbolic acid, etc." Dr. Abbott became Head of the Department of Chemistry at the University of North Dakota in 1910 and taught there for 37 years. One of Dr. Baker's last major students was Raymond F. Bacon (1899) who later received his Ph.D. at the University of Chicago and became Dean of the Graduate School of Chemistry at the University of Pittsburgh.

In 1895 Dr. Baker offered a course which was listed as having "no laboratory but which consisted of 65 experimental lectures to provide an introduction to those who wish to obtain a general knowledge of the subject ...." No fee was required. He was a popular and conscientious teacher. In the 1899 Mirage he was credited with making chemistry a pleasure, and again in the 1902 Mirage (published in 1901 just before his death) it was noted that "to be in his classes a year is to love the subject".



Chemistry lab in the basement  
of East College, 1895  
(double exposure)

During his last years his health began to fail, reportedly from inhalation of chlorine. In 1967, Dr. George A. Abbott, who was Dr. Baker's student in 1895, and over 90 years of age at this time, wrote the author as follows: "For twenty years the DePauw catalog stated, 'At present the Chemistry Department is in the basement of East College,' an utterly unsatisfactory location, with low ceilings and almost no ventilation even through the so-called hoods. Dr. Baker, the best teacher I ever had, was a victim of this lab. He never regained normal health after an accidental inhalation of chlorine and lived only a few years," After years of teaching in inadequate facilities Dr. Baker was to be rewarded with a new building. On January 7, 1901, a report of the Chancellor, William H. Hickman, announced that the first gift of \$25,000 by D. W. Minshall of Terre Haute for a new science laboratory

had been received. A Committee for Construction included Chancellor Hickman, Robert O'Hair of Greencastle, President Gobin, other members of the Board, and Dr. P. S. Baker. Much of the initial planning of the building fell to Dr. Baker. But he was not

destined to enjoy this building which he had helped design. In the late summer of 1901 he had gone to Asheville, N.C., because of ill health, hoping to recover. However, he died in Asheville on September 2, 1901, at the age of 51. His funeral was on September fifth at the Greencastle College Avenue Methodist Church. As a former DePauw mathematics professor, Dr. Will Edington, might have said—"He was one of the giants of those days."

#### BLANCHARD AND OLD MINSHALL LABORATORY



William Martin Blanchard (right) consults with a student

In the fall of 1901 it became necessary for the DePauw administration to secure a professor of chemistry immediately. To their everlasting good fortune, the man for the position was only forty miles away teaching chemistry at Rose Polytechnic Institute in Terre Haute, and the position was offered to him. William Martin Blanchard, a 28 year old Ph.D. in chemistry from Johns Hopkins, was encouraged by W. A. Noyes, head of chemistry at Rose, to accept this position at DePauw.

And so Dr. Blanchard, the first Ph.D. in Chemistry to be hired by DePauw, was appointed directly to the rank of Professor of Chemistry. It was fortuitous that this man from North Carolina, a graduate of Randolph—Macon, would come to DePauw where he would spend the next 40 years. Under him chemistry would be firmly established, and the total University would feel his academic impact when he became Dean in 1927.

When Dr. Blanchard arrived in Greencastle, chemistry was still being taught in East College. The cornerstone of the new laboratory had been laid on June 7, 1901; and the walls of the building had been raised to the height of eight feet by September. At graduation time on June 11, 1902, The D. W. Minshall Laboratory was dedicated, but it was not until January 1903 that the Chemistry Department would move into the first and second floors of the north wing. Later the Department of Physics took over the south wing of the building. For the first time in 65 years the Physical Sciences had adequate facilities at DePauw. Chemistry now had a lecture room, a large laboratory, and a private laboratory on the first floor while on the second floor there was located an organic chemistry laboratory, a balance room, another private laboratory, a new library and a storeroom. Not until the 1930's would the Chemistry Department occupy the upper third floor.

The P. S. Baker Memorial Library was a gift of the class of 1882 and contained approximately 300 volumes of chemical references with several sets of journals, including the German Berichte, the American Chemical Journal and the Journal of the

American Chemical Society. In a few years Liebig's Annalen, the Journal of the Chemical Society, and the Journal of Industrial Chemistry and Beilstein's Handbook were acquired. Soon the first volume (1907) of Chemical Abstracts would be added to the list. Dr. Blanchard made special note of the Memorial Library in 1903 when he wrote,

It has been placed in the department as a memorial to Dr. Baker, one of the most popular teachers the University has had.

He also expressed the need for a Chemical Library when he wrote in the 1905 Mirage,

But a chemistry department is not complete when it is supplied with a well equipped laboratory. It must be able to take the student back to the "original sources", to acquaint him with the works of the old masters... and the workers of his own day. To do this the department must have a chemical library.

Blanchard's foresight in providing for this library was the cornerstone upon which rests DePauw's success as a home in a distinguished liberal arts college for the preparation of chemists. The fact that DePauw was the first educational institution in Indiana to acquire the full set of Liebig's Annalen attests to Dr. Blanchard's insistence that DePauw provide adequate research references.



Minshall Lab

The new Minshall Laboratory was placed just southwest of East College, east of the Phi Kappa Psi House. Many a Phi Psi made class on time even after a late start. Minshall Laboratory was to function for 70 years. Although built to last much longer, the demands for a modern instrumental science curriculum dictated the need to plan for a change in the late 1960's.

On June 12, 1905, a bronze tablet in honor and memory of John Simison, alumnus in the class of 1879 and a physician at

Romney, Indiana, and his wife, Harriet Eliza Agnew Simison, was dedicated by the DePauw Board of Trustees and Visitors in recognition of the generous gifts to DePauw by their children. This plaque hung in the north stairwell of Minshall Laboratory for 67 years. Today it graces the lobby of the Julian Science and Mathematics Center, together with the limestone bas-reliefs which once were keystones over the east doorways of the lecture room added to Minshall in 1931. They are reminders of an era of DePauw's history. In 1980 the author, upon his retirement, wrote the following tribute, "Old Minshall Laboratory had a special spirit felt by all who worked there—something

lingered there of all those men and women who in the rigor and enthusiasm of youth had worked and dreamed there. In later life their combined achievements would be astounding."

On that June 12, 1905, dedication of this bronze tablet, a young man, Ross Allen Baker, entertained the assembled guests with a violin solo. He was the son of the late Professor of Chemistry, Philip S. Baker. Young Baker upon graduation, June 13, 1906, with a major in chemistry, had to decide between music or chemistry. He chose chemistry and became one of DePauw's most honored chemical educators and received the honorary D.Sc. from DePauw in 1937. In 1933-34 he served as chairman of the Division of Chemical Education of the American Chemical Society. It is of interest to record that in 1914 Ross Baker married Miss Helen Porter while he was teaching at Baker University. Helen Porter was the daughter of Alice Downey Porter, who was one of the daughters of Charles G. Downey, the third Professor of Natural Science at Asbury. In 1938 when Philip S. Baker II, a son of Ross and Helen Baker, was graduated in chemistry from DePauw, he continued the long tradition his father, his grandfather Baker, and great-grandfather Downey had established over past years at Asbury and DePauw. As his father, Ross, had been one of Dr. Blanchard's first students, Philip was in the last Blanchard class of chemists.

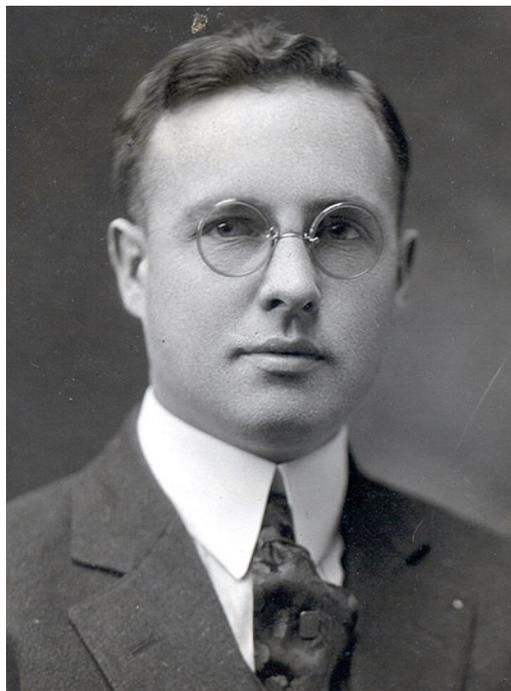
Professor Blanchard rapidly gained the respect of faculty and students at DePauw. The popularity of the young professor is felt in the 1907 Mirage, where he was cited as follows: "...then there is Dr. Blanchard, of the large Southern heart and the Johns Hopkins' spirit of chemistry." During the first twenty years at DePauw his teaching load was always heavy. Nevertheless he did find time for some research and published an article in the April, 1912, issue of the Journal of the American Chemical Society entitled, "A Simple Method of Illustrating the Relative Conductance of Salts and Acids in Dilute Solutions." This article was one of the first published chemical papers to come from DePauw.

In these early years additions to the chemistry staff were usually recent DePauw graduates who stayed on for a year or two of graduate study. A study of the yearly catalog and issues of the Alumni Register unfolds a list of the names of chemistry majors too numerous for a report on each person except those who played a role at DePauw. In 1908 Blanchard organized the Chemistry Club, "to keep the major students in touch with contemporary investigators in pure and applied chemistry." James E. Egan was graduated in 1908 and obtained a fellowship for graduate study at the University of Illinois. He earned his Ph.D. in 1912 in time to return to DePauw as Acting Professor of Chemistry and Blanchard's replacement in 1912-13. In this year Dr. Blanchard with his wife and son traveled to Germany, where he held a Research Fellowship at the University of Berlin with Dr. Otto Diels. His work there was productive, since it led to another publication in the 1914 Berichte with Diels and H. Heyden on the "Properties, Structure and Derivatives of the Dimeric Diacetyl." Dr. Egan left DePauw on Blanchard's return to become Assistant Professor of Chemistry at Miami University, in Oxford, Ohio.

In June, 1914, George L. Clark received the A.B. degree from DePauw and by August, 1914 had earned the M.S. degree from the University of Chicago. He then returned as an instructor to teach at his Alma Mater for the next two years. In 1915

Organic Chemistry became a two-semester sequence. A major now required General 1, General Laboratory 1A, Qualitative 2, Organic 3 and 4, Quantitative 5 and 6, Industrial 7 and 8; and in 1916 a course in Physical Chemistry was listed in the catalog for the first time. It was identified as a "further study of the fundamental principles of chemistry with lectures and laboratory for five credit hours." Also in the 1916 catalog, Dr. Blanchard is listed as the "Simeon Smith Professor of Chemistry" since the estate of Simeon Smith, a farmer of Green County, Indiana, had been converted to an endowment to support the Chair of Professor of Chemistry.

In the fall of 1916 John F. Logan, with an A.B. from Arcadia University (Canada) and an M.A. from Yale, replaced George L. Clark, who had a fellowship to study for his Ph.D. at the University of Chicago. In a year Mr. Logan left to join the Canadian Army, and Dr. Blanchard was again alone in the Chemistry Department. A typical day was to prepare and give four lectures, to conduct laboratories, and at 4:00 p.m. to guide a class in Industrial Chemistry. In 1919 Dr. Clark, fresh from the University of Chicago and the U.S. Army Chemical Warfare Service, returned as an Assistant Professor. However, he remained only one year. Dr. Clark was destined to move on to greater recognition. After two years at Vanderbilt University he held a National Research Fellowship at Harvard (1921-1924). He established an X-Ray Laboratory at Massachusetts Institute of Technology in 1924-1927 and published the first edition of Applied X-Rays in 1926. He spent an illustrious career at the University of Illinois from 1927 until his death in January, 1969. He was a pioneer in X-Ray Spectroscopy. During his years of retirement he returned to DePauw as Visiting Professor of Physical Chemistry in 1960-61. After his death, his widow, Mary Clark, donated his chemical library to DePauw, and it is now a part of the Prevo Library. He was given the honorary D.Sc. in 1937 by DePauw.



Ralph W. Hufferd

In October 1920 Ralph W. Hufferd, a 1915 graduate of Washington University and a 1920 Ph.D. from the University of Illinois, joined the staff as an Assistant Professor. His chief responsibility was to teach the classes in Organic Chemistry, while Blanchard, in those years, taught the General Chemistry, the Analytical classes plus the now established one-semester Physical Chemistry course. With Dr. Hufferd on the staff several new courses were offered. In 1920-21 a course entitled Thesis was established. It was a one-semester laboratory research project, requiring 15 hours a week in the laboratory and the final report of the work in a "thesis." In 1923-24 Chemistry 310, Pre-medic Organic, was initiated, and by 1925-26 a course entitled Qualitative Organic Analysis (Chemistry 403) was first offered by Dr. Hufferd.

The decade of the 20's was good for Blanchard and for chemistry at DePauw. Dr. Blanchard was now in his prime. He was secretary of the faculty, secretary-treasurer of the Indiana Intercollegiate Athletic Conference (1922-

1936), Director of Admissions (1925), Doubleday-Doran published his Introduction to General Chemistry and his Laboratory Manual in General Chemistry in 1928; he was president of the Indiana Academy of Science in 1926, and became Dean of the University in 1927. He remained as Dean until retirement in June, 1941, and, except for the last year of his tenure as Dean, he also continued as Head of the Department and Professor of Chemistry. The 20's and 30's were years when productive and dedicated students undertook the study of chemistry. With the end of World War I, the realization that improved scientific research, both in the university and in industry, was absolutely necessary, provided the impetus for an increased popularity for careers in science. DePauw was prepared to provide the needed science training. In 1925 Merrell R. Fenske was graduated from DePauw and continued at M.I.T., receiving the Sc.D. in Chemical Engineering in 1928. Wilbert B. McCluer, a friend of Fenske's, was graduated in 1926 and then stayed on as a graduate student and an assistant in the Department. In 1927-28 he was named an instructor. Mr. McCluer followed his friend Fenske to M.I.T., where he received a Masters degree in Chemical Engineering. Dr. Fenske made his career at Pennsylvania State University and became world famous as a Professor of Chemical Engineering. He was given an honorary D.Sc. by DePauw in 1946. The Chemical Engineering Building at Pennsylvania State now bears his name. Wilbert McCluer also spent his early years at Pennsylvania State, working on research projects in lubricating oil. He eventually became associated with Rohm and Hass Chemical Company and served for twenty years as manager of the Bristol manufacturing plant.

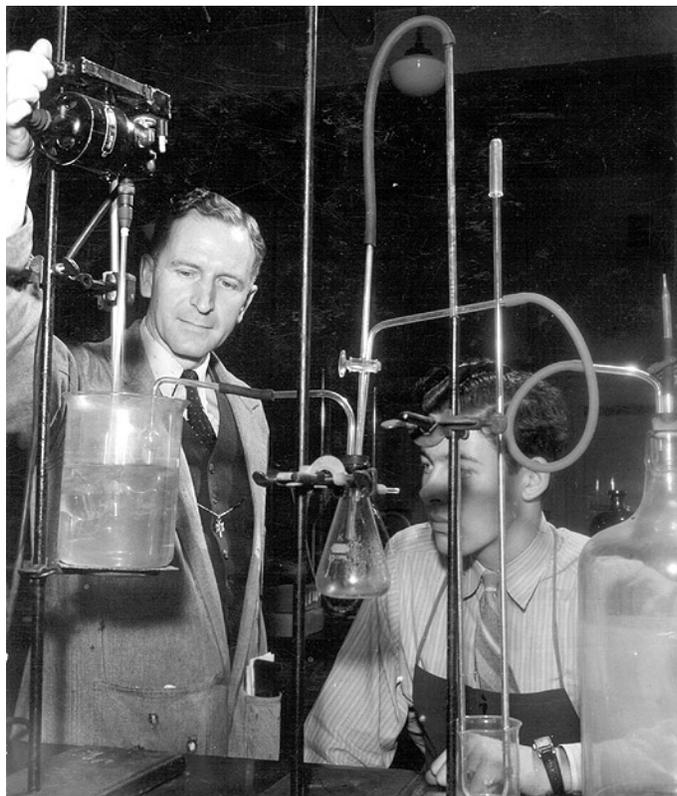
After Dr. Fenske's death in 1971, Mr. and Mrs. McCluer gave a gift to DePauw in honor of their friend. Three research laboratories in the new Science and Mathematics Center were designated as Fenske Student Research Laboratories as a result of this gift. Later in 1973 Mr. and Mrs. McCluer also initiated the McCluer Science Awards Program to encourage outstanding chemistry majors and to provide funds for their research and study during summers and in the academic year. In 1974 the program was broadened to include students in all the sciences. This program today plays a vital role in the training of DePauw's potential scientists.

In 1928, J. Thomas Pedlow (B.S., Pennsylvania State, and M.S., at Rutgers University) joined the staff as an instructor, for the additional administrative duties for Dean Blanchard necessitated the services of a third full-time staff member. Mr. Pedlow remained until 1932.

In the 1930's there were two very significant decisions which Dean Blanchard had to make. In June of 1933 he had to inform Dr. Ralph Hufferd, a full professor since 1925, that he was discharged from the University. It was probably a most distasteful job for this man "of the large Southern heart." In 1932 he made the decision to provide research funds and work space for his gifted black student, Percy Lavon Julian, who had graduated in 1920. Dr. Julian, who had just received the Ph.D. in Vienna under Dr. Ernst Spath, was given an appointment to the staff as a Research Fellow. He brought with him Dr. Josef Pikel, who was made an assistant in chemistry. But more of this decision later.

The Hufferd case has been well covered by Professor George B. Manhart in his book, DePauw Through The Years. Apparently President G. Bromley Oxnam had been at odds with Professor Hufferd for several years because of Hufferd's continued

criticism of the administration and its educational policy. In early 1931 he had been warned that his criticism must be tempered or he would be discharged. At that time Dean Blanchard intervened to keep him on the staff, and he was given a leave to go to Europe during the year 1931-32. It was hoped that Hufferd would temper his outspoken opinions.



Jervis M. Fulmer in 1931

In the fall of 1931 Dr. Jervis M. Fulmer, B.S. from Washington State, M.A. from Minnesota, and the Ph.D. from the University of Colorado, was appointed an Assistant Professor of Chemistry. Dr. Fulmer had teaching experience at Roberts College in Istanbul, Turkey, and at the Colorado School of Mines in Golden, Colorado. One of Fulmer's responsibilities was teaching the course in Physical Chemistry. He increased the course to two semesters, Chemistry 408 and 409, and continued to teach it until 1947. In 1936 the course numbers were changed to Chemistry 411-412.

When Hufferd returned to DePauw in the fall of 1932, he found two new staff members, Dr. Fulmer and Dr. Jesse L. Riebsomer, a 1928 DePauw graduate with a Ph.D. from Cornell who was made an instructor for the 1932-33 year. Apparently Oxnam's decision about Hufferd waxed hot

and cold during the year, with one report in early 1933 that Dr. Hufferd's contract had been renewed for the next year. However, in June, 1933, after graduation had closed the school year, he was denied a renewal of his contract and dismissed from his position. It was too late in the year for much student reaction; and since there were also 18 other individual professors who did not receive 1933-34 contracts in this year of the Great Depression, Hufferd was one among many. The dismissal was appealed by Professor Hufferd to the American Association of University Professors, and, after an investigation of the situation by the Association, DePauw was listed as a "censored" institution in November, 1934. In this case the decision by the President and his Dean, although supported by some staff members and by the Board of Trustees, was considered by many as unjust. However, the decision was never rescinded.

As in the case of Joseph Tingley a half century before, the immediate and unexplained dismissal of Professor Hufferd left many of his former students with a feeling of dismay that such action would be taken to remove one of their favorite teachers. In the fall of 1933 individual letters written by approximately 30 of the recent alumni who had majored in chemistry were sent to President Oxnam and to each member of the Board of Trustees. They all requested a review of the decision to

discharge Dr. Hufferd. Each letter contained great praise for Hufferd and expressed the hope that a reconciliation could be found so that he might be reinstated. His students recognized his frequent lack of tact and the fact that "he was no yes man." But they also pointed out that DePauw's enviable record for the past ten years in developing strong chemistry majors was due to the efforts of Hufferd, as well as Blanchard. One alumnus closed his letter with the observation that he "looked upon Hufferd and Blanchard as a team." It is noteworthy that of the individuals who made this appeal for Hufferd in 1933 three of them were later honored by DePauw with the honorary D.Sc.; most of them received the Ph.D. in chemistry; and all held responsible positions in chemistry in later life. But the Board did not change the decision of Oxnam and Dr. Hufferd was forced to find other employment. He later played a major role in the U.S. Chemical Warfare Service during and after World War II. In 1935 a faculty regulation, "Academic Freedom and Tenure," adopted by the DePauw Board of Trustees, would have made it impossible to dismiss Dr. Hufferd had the regulation then been in effect in 1933. But by 1936 President Oxnam was now Bishop Oxnam, and President-elect Clyde Wildman had requested the A.A.U.P. for a reevaluation of DePauw's standing. In December 1936 DePauw was returned to the "approved" list of the American Association of University Professors.

The other decision of Dean Blanchard was one which opened a new door for Dr. Percy L. Julian. In 1932 Dr. Julian was in need of a position in which he could continue his research career. DePauw gave him that opportunity. Dr. Julian was provided research facilities and the opportunity to direct the graduate and senior research of a number of the chemistry majors. During the next three years the quantity and quality of research papers turned out by Dr. Julian and his students was phenomenal for an institution the size of DePauw. During the years 1933 through 1935 a number of publications in the Journal of the American Chemical Society were authored by Percy L. Julian and DePauw seniors Doyle Boggess, Arthur Magnani, Bernard M. Sturgis, Wayne Cole, Frank E. Wantz, William J. Gist, Thomas F. Wood and Ray Dawson. The synthesis of the basic ring structure of physostigmine was a part of these research studies. There is an article in the April, 1935, issue of the Journal of the American Chemical Society which has a heading of "Contribution from the Chemical Laboratory of DePauw University". Its title is "Studies in the Indole Series V. The complete synthesis of Physostigmine (Eserine)". The authors were Percy L. Julian and Josef Píkl. Of all the research and scientific reports to come from DePauw, this record of the first complete synthesis of the alkaloid physostigmine is undoubtedly the most significant publication to come from this institution. However, in spite of this achievement in late 1935 Dr. Julian was informed that his hope to be given an appointment to the DePauw teaching staff had been refused by the Board of Trustees. This rejection of his dream to become an academician forced him to seek an industrial position. It was his good fortune to be made the Director of Research for the Glidden Company in 1936. Ultimately he would establish his own research laboratory in Franklin Park, near Chicago. Yet, in spite of this rejection by his Alma Mater, his love and concern for DePauw continued throughout his life. He was given the honorary D.Sc. in 1947 and became a member of the Board of Trustees in 1967.



Jessie Riebsomer

During the 30's the sciences were the beneficiaries of the many good students attracted to DePauw by the Rector Scholarships. In 1932 there were 400 Rector Scholars enrolled. During these years the new young professors, Jervis Fulmer and Jessie Riebsomer, carried the heavy academic loads while Blanchard continued a reduced teaching schedule together with his duties as Dean. In 1931 he was characterized by the DePauw as the "busiest man on campus". The number of science majors was large enough to make the Science Club the largest one on campus. Later each department organized its own club, and in 1939 the Chemistry Club was reestablished after a hiatus since its founding in 1908. Richard Geckler was the first president and Doctors Fulmer and Riebsomer were the advisors.

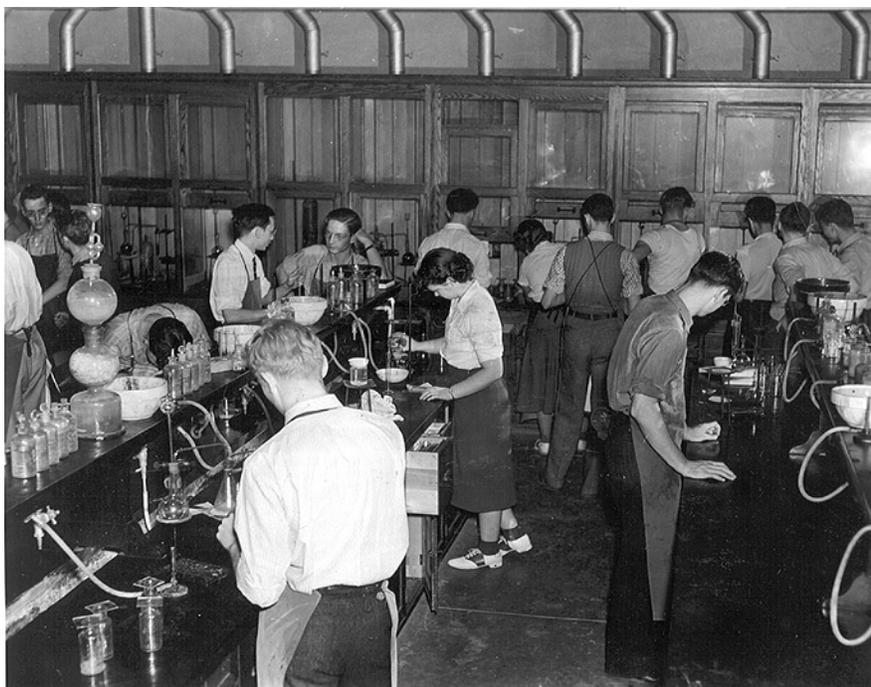
The first published sequence of course work recommended for preparation for graduate school was in the 1932-33 catalog, and in 1933-34 the 500 numbered courses which provided the framework for the M.A. degree in chemistry appeared. In 1937 Dr. Blanchard was given an honorary Sc.D. by Simpson College in Iowa, and in the academic year 1937-38 he saw his last class graduate. The photograph of the class of 1938 hung in the lecture room of Minshall Laboratory for almost 35 years. One of the young members of that class was Howard B. Burkett, who returned in 1945 to teach organic chemistry. Dr. Burkett recalls that Dr. Blanchard had his peculiarities, including a habit of picking up a student's long-awaited precipitate in the test tube and shaking it with the comment, "What have you got here?" He, too, encountered Blanchard's determination to do "it his way," although upon reflection Dr. Blanchard frequently saw the other side of the problem.

After graduation in June, 1938, Blanchard had a serious heart attack and was forced to reduce his activity greatly. He was given a sabbatical leave for the year 1938-39, and a former student, Dr. Laurence Oncley, ('07) of Southwestern College in Kansas, was hired to take his place in the Chemistry Department. When he returned in September, 1939, he carried on his duties as Dean but did not teach again.

In 1939-40 Fulmer and Riebsomer were joined by an instructor, J.C. Cowan, who taught the organic chemistry and also for the first time offered Chemistry 503, Qualitative Organic Analysis. Miss Marguerite Andrade of the Romance Language Department offered a one credit hour course in French Chemical Literature. In 1940-41 Dr. Fulmer first offered a course for non-majors in Physical Chemistry (Chemistry 307), and the literature course, Special Topics in Chemistry (421-422), became a requirement

for a major. The first accreditation of the Department by the American Chemical Society was completed in the 1940-41 year. Dr. James Cason (Ph.D., Yale) taught the organic courses for this one year.

On September 1, 1941, the appointment of Dr. Jesse Riebsomer as Head of the Chemistry Department was announced, and Dr. Milton Kloetzel, a Ph.D. from the University of Michigan (1937), was named an Assistant Professor to teach the organic



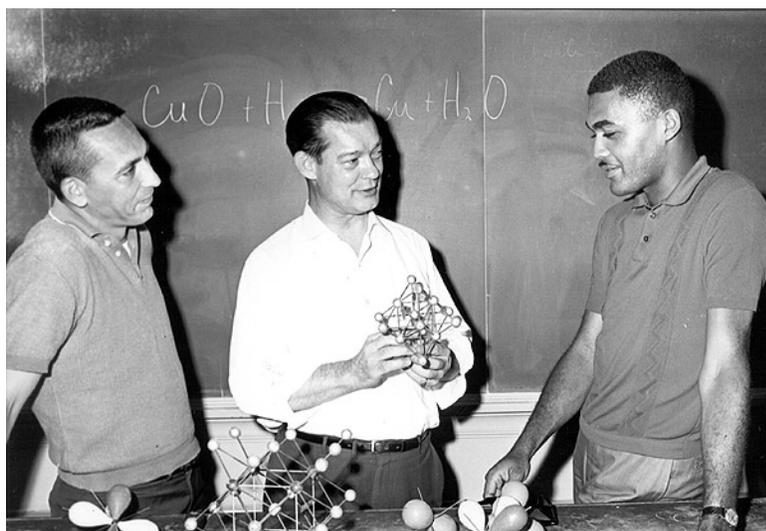
Chemistry Lab Students in Minshall Lab  
1938-39

classes. Dr. Fulmer continued to teach the Analytical and Physical Chemistry, and Dr. Riebsomer taught the General Chemistry and advanced course work. During this year an era of DePauw University had drawn to a close as Dr. Blanchard approached his retirement. On June 7, 1941, the Alumni Day Chapel was dedicated to him and alumni of the Chemistry Department gave tribute. Dr. George L. Clark spoke of him as teacher, scientist, humanitarian, administrator, and poet. John B. Gross spoke of his influence on the premedical student, and William F. Hester presented a Book of Letters from his former students. A Research Fund for the support of future students was established in his name. On July 1, 1941, he retired from the University.

William Martin Blanchard had established one of the strongest undergraduate chemistry departments in the Midwest. Upon retirement he could claim that 90% of his graduates were still practicing chemists. He could also point with pride to many who were taking over leadership roles in the profession. In later years, in addition to the three already mentioned, DePauw gave the honorary D.Sc. to four other students who studied under Blanchard. They were Dr. Herbert E. Carter, former Head of the Department of Chemistry, University of Illinois; Dr. John M. Buchanan, Professor of Biochemistry, Massachusetts Institute of Technology; Dr. John W. Cusic, former Research Chemist, G.D. Searle & Co.; and Dr. Leon H. Schmidt, Adjunct Professor of Pharmacology, University of Alabama-Birmingham. Dr. Blanchard died on December 21, 1942, at 68 years of age. The title of his Presidential Address at the Indiana Academy of Science meeting in 1926 had been, "The Unselfish Service of Science." His was an unselfish service for DePauw.

## THE POST WORLD WAR II YEARS

World War II brought changes to the campus in 1941. Compromises had to be made to accommodate the needs of the students and the times. In the next two years the number of chemistry graduates remained high with most of the men being given deferred draft status allowing them to continue in graduate school or in medical school. By January, 1943, when the number of men on campus had declined greatly, the first unit of the Navy V-5 students arrived; and in July, 1943 the first 400 Navy V-12 men were assigned to DePauw. It was this latter group of Navy men who populated the courses in General Chemistry, Quantitative Analysis, and Organic Chemistry for the next two years. During the academic years 1941-45 the staff remained the same plus the addition of James A. Bittles, Sr. (A.B., DePauw, 1918) in 1944 as an assistant.



Donald Jack Cook working with high school and other chemistry educators

On a beautiful spring day in 1945, Donald J. Cook was interviewed by the Department to replace Dr. Milton Kloetzel, who had accepted a position at the University of Southern California. Dr. Cook had arrived on the New York Central Southwestern Limited from Cleveland, Ohio, where he was employed by the Lubrizol Corporation. He was met by Dr. Riebsomer and was driven to the campus. After a full day of interviews, it was time to depart on the evening eastbound train. Professor Riebsomer's gas ration card must have been low, since he

conveyed the author back to the depot on the handlebars of his bicycle. It was a rough ride down North Madison Street. Regardless of this "rough" departure, D. J. Cook (B.A., Augustana, 1937; M.A., Illinois, 1938; Ph.D., Indiana, 1944) was appointed Assistant Professor beginning July 1, 1945. He taught the last V-12 General Chemistry class during the 1945 summer term. He would teach for forty years at DePauw University.

In October of 1945 Dr. Riebsomer resigned from his position at DePauw to accept the position of Head of the Chemistry Department at the University of New Mexico in Albuquerque. In his thirteen years at DePauw he had won high praise as a teacher and had encouraged a large number of students to become chemistry majors. Dr. Howard B. Burkett, who was a research chemist at Eli Lilly, a 1938 graduate of DePauw and recipient of a Ph.D. from Wisconsin in 1942, was appointed Assistant Professor as Dr. Riebsomer's replacement. Dr. Jervis Fulmer was named Head of the Department of Chemistry, a position he would occupy until retirement in 1964. For the next several years Dr. Cook taught the General Chemistry courses, Dr. Burkett taught the Organic courses, and Dr. Fulmer taught Quantitative Analysis and Physical Chemistry. Mr.

Bittles continued as an Assistant in the General Chemistry laboratory until 1947. Mrs. Marguerite Jones Fulmer (B.S., State College of Washington, 1921; M.A., Indiana State College, 1961) was appointed an Assistant in the laboratory in the fall of 1946 when the large influx of students swelled Minshall's laboratories to the limit. Mrs. Fulmer remained on the staff as a valuable laboratory instructor in General Chemistry until 1964 when she retired with the rank of instructor.

In 1948 Wallace S. Brey (Ph.D., Pennsylvania) taught Physical Chemistry and a minor course in Quantitative Analysis for one year. Dr. Brey then joined the chemistry staff of Florida State University in Tallahassee where he specialized in infrared spectroscopy. In 1949 Russell W. Maatman (Ph.D., Michigan State, 1950) replaced Dr. Brey and remained at DePauw through the academic year 1950-51. He resigned to accept a position in industry. In the first semester of 1951-52, Dr. Fulmer had a



John A. Ricketts

sabbatical leave at the National Laboratory in Oak Ridge, Tennessee. To teach the Physical Chemistry during this year, Robert F. Krah (Ph.D., Washington University) was added to the staff. He took a position at the University of Arkansas after his one year at DePauw. In 1952-53 John A. Ricketts (B.A., Indiana, 1948 and Ph.D., Western Reserve, 1953) joined the staff to teach Physical Chemistry. The appointment of Dr. Ricketts stabilized the Department's need for a physical chemist, and the problems resulting from a constantly changing staff came to an end. The growth of the Department in number of majors and its function as a service department for medical students

and other science majors made it necessary to look for a fifth staff member in 1953-54, when Edwin Lewis Poole (Ph.D., Iowa State) was hired to fill the need for an analytical chemist. Dr. Poole remained one year but resigned to take a position with Middlebury College. The appointment of another staff member was deferred after the departure of Dr. Poole; and Burkett, Cook, Fulmer and Ricketts constituted the DePauw Chemistry Department for the next five years.

By the spring of 1946 the war years had taken their toll on chemistry graduates when only three women - Elsbeth Roeder Ancitil, Marjorie Eisenmans Seffi, and Marion Palmer Weyrauch, received their B.A. degrees in chemistry. Nevertheless, by 1947 the tide had begun to turn, and there were twelve B.A. graduates. A new era had begun in the DePauw Chemistry Department, and for the first time the 1945-46 catalog contained the acknowledgement that DePauw had met the standard set by the American Chemical Society Committee for the Professional Training of Chemists. This recognition continues to the present.

Although there was no course for research credit in the chemistry curriculum in the 40's and 50's, senior research was again emphasized as it had been in the 1930's. One important decision was the reestablishment of the graduate program in 1947 with a course of study leading to the M.A. degree in chemistry. This program was designed to appeal to graduates from schools which were not able to provide full undergraduate training. With the M.A. from DePauw these students would be able to undertake further study at the large university or find a career in industry. The program was supported by the DePauw Administration by providing stipends for teaching assistantships and free tuition. Fellowships were available for some students through grants obtained by staff members. In 1962-64, as a cooperative M.A.-Ph.D. program with Purdue University, six graduate fellowships were supported by funds provided through the National Defense and Education Act of the federal government. C. Kenneth Bjork, of Augustana College, was the first to receive the M.A. in 1950; and Frank M. Brower, from Iowa Wesleyan College, was the second in 1951. During the next three decades over fifty M.A. degrees were granted. The program was discarded after 1978, when the supply of good graduate students was diluted by the needs of the new Ph.D. granting institutions. But between the years 1945 and 1972 Old Minshall was alive again with research activities late into the night and on Saturdays and Sundays. A number of publications resulted from the senior research reports and the Master's theses produced during these years.

The program of sabbatical leaves granted by the DePauw Administration after World War II provided much of the impetus for staff research and writing. In 1952-53 Professor Cook was a postdoctoral fellow at Purdue University, working on the synthesis of a number of fluoronitroalkanes. The following year (1953-54) Dr. Burkett held a postdoctoral fellowship at the University of Washington and completed a study of deuterium isotope effects in the decarbonylation of aromatic aldehydes. In subsequent pages we shall find that the DePauw chemistry staff through the years 1945-1986 has made the most of all such opportunities to maintain the strength and national recognition of the Department.

In the 1940's and 1950's sources of funds for support of research were limited. However, the Research Corporation of New York was first to provide funds to support the programs of Dr. Cook and Dr. Burkett. Later Dr. Ricketts and Dr. McFarland would obtain Research Corporation Grants for their research. In 1952-53 the DuPont Company made its first award to DePauw in the amount of \$2500. This award continued almost yearly until 1979-80, when the grant was for \$7,000. The DuPont Company has been most generous to the Department over the years with grants-in-aid totaling more than \$75,000.

In the five years 1953-57 the Sherwin-Williams Company provided five scholarships. Through the years 1952-1961 the Standard Oil Foundation provided nine \$1,000 grants to DePauw. One half of the grant was an award to an outstanding student, and the remaining \$500 was to support the Department.

A grant of \$1,000 for equipment was provided by the Monsanto Chemical Company in 1956, and a series of Shell Assist Awards was made from 1958-1963. A Research Corporation Grant obtained by Dr. Ricketts in 1954 provided the funds for a K-2 potentiometer and a sensitive galvanometer for research studies. In 1958 the first

infrared absorption spectrometer (a Perkin-Elmer Infracord) was purchased with funds from a Gulf Oil Assist Grant of \$1,000, an Eli Lilly Award of \$500, and an Esso Education Fund Grant of \$500, plus \$2,500 from a Research Corporation Grant which Dr. Cook had received. Other instruments purchased by the University during the 1950's was a Beckman D.U. Spectrometer, a Spectronic 505 U.V.-Visible Recording Spectrophotometer and Magnet and Power Supply for a Gouy Balance. An important gift of \$5,000 was made by Charles J. Lynn, Vice President of Eli Lilly and Company, in May, 1958 to help in the purchase of new laboratory desks for the general chemistry laboratory.

One other source of support money became available during this period when the Lubrizol Corporation of Cleveland established its first Chemistry Award in 1957. The grant provided for a cash award to the top-ranking senior chemistry major and a matching grant to be used by the Department. In 1957 Richard R. Boettcher was the Lubrizol recipient. The Lubrizol Award has been continued by the foundation for thirty years up to the present. Mr. Jeffrey A. Hansen was the 1986 recipient.

During the decade of the 1950's the curriculum of the Department remained fairly constant. In the 1949-50 catalog a new course, Chemistry 414, Advanced Physical Chemistry, was first listed. In 1955-56 a change in the graduate classes listed studies in Advanced Chemistry as Chemistry 506A, Inorganic, taught by Cook; 506B, Organic, taught by Burkett; and 506D, Physical, taught by Ricketts. In 1959, Chemistry 405, Identification of Organic Compounds, was transferred from the graduate level (503) to the undergraduate schedule. By 1960 the Advanced Physical Chemistry had been changed to Chemistry 424, Valence, an Introduction to the Quantum Mechanical Treatment of Chemical Bonds.

In 1951 a report by Dean Harry L. Lewis of The Paper Institute in Appleton, Wisconsin, published in the Journal of Chemical Education, gave DePauw the second highest rank among 21 similar schools for the production of Ph.D. chemists in the decade 1936-1945. Oberlin was first with 56 graduates who had earned the doctorate, and DePauw had been the undergraduate home for 44. Twenty-five years later (1976) compilations of the Baccalaureate Origins of Ph.D.'s in Chemistry, done by the staff at Franklin and Marshall College in Pennsylvania, revealed that DePauw ranked as the fifth most productive school out of 210 independent undergraduate colleges for the years 1920-1976. The same study also had DePauw ranked seventh for the years 1967-1976.

In 1952 Richard W. Fulmer was graduated from DePauw with a major in chemistry and joined the professional chemistry ranks along with his father, Dr. Jervis Fulmer, Head of the Department; his brother Glenn, a chemist from Oberlin; and his mother, Mrs. Marguerite Fulmer. In addition, he was the second third-generation chemist in this family, since his grandfather, Dr. H. Elton Fulmer, had been head of the chemistry department at Washington State University in Pullman, Washington.

In 1954 several staff members were recognized. Dr. Howard Burkett when he was named the "best teacher" at the Sigma Delta Chi recognition banquet. The record also shows that the class of 1954 had eleven graduates with a chemistry major. Of the eleven, ten continued to graduate school and received the Ph.D. degree, while the other

completed the M.D. degree. During the academic year 1955-56, Dr. Fulmer was on a sabbatical leave the first semester to study schools of nursing in preparation for the establishment of the DePauw School of Nursing.

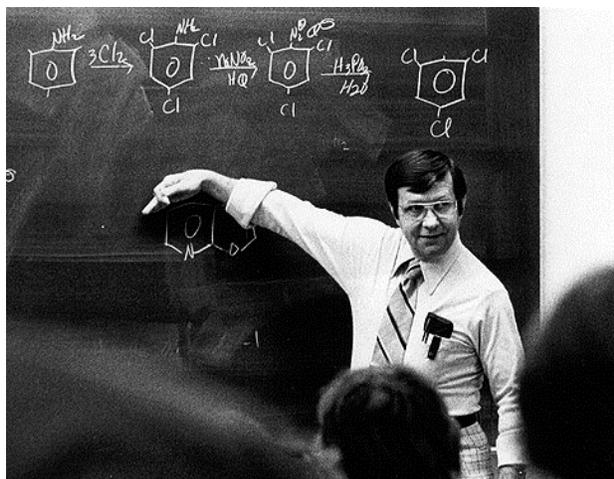
With the launching of Sputnik by Russia in 1957 our confidence in American education was shaken. The resulting self-evaluation found our educational system lacking in the training of our teachers of science and mathematics. Therefore, in the spring of 1958 Professor Cook authored a proposal to study the needs in science education at the intermediate and junior high school level. President Russell Humbert gave his approval to the project and was able to obtain a grant in the amount of \$7,500 from the International Nickel Company for the financial support of the study. In the summer of 1958 seven members of the DePauw Science and Mathematics Division, plus educational consultants from the Indianapolis Public Schools and the DePauw Department of Education, completed the study. The report published in the fall of 1958, "The Improvement of the Teaching of Science and Mathematics in the Elementary Grades," gained national recognition and made possible DePauw's success in obtaining the support of the National Science Foundation for the six-week Summer Institutes in General Science and Mathematics for the next twelve years.

In many ways the success of the program brought rewards to DePauw and to a number of staff members. Seven members of the DePauw staff taught in the program each year, and they provided the training for approximately 70 intermediate and junior high school teachers who studied on the campus each summer. By 1970 almost 1,000 teachers had benefited from this training. In 1968 and 1969 the course of study was conducted at a Department of Defense School in Munich, Germany; and in 1970 the Institute was held at the Franklin D. Roosevelt School in Lima, Peru, for teachers in our Department of State schools throughout South and Central America. The Institutes were directed by Dr. Cook, and Dr. Ricketts served as Laboratory Director. Dr. O. H. Smith, Professor Emeritus of Physics; Dr. Howard Youse, Professor of Botany; Dr. Forst Fuller, Professor of Zoology; Dr. Clinton Gass, Professor of Mathematics; and Dr. James Madison, Professor of Geology, were the remaining members of the Institute teaching staff during these first years. With some staff changes the program continued through 1970. In subsequent years a modified version of the summer science course was established as two courses in General Studies 381-382, "Introduction to the Natural Sciences," to satisfy the science requirement for majors in elementary education.

With the increased need for additional course work in the chemistry department and also because of the needs in general science of the University, the administration made possible the appointment of Mr. Harry L. Golding (B.A., University of Omaha, 1954; M.S., Northwestern University, 1958) as an instructor in the Department beginning in the fall of 1958. His responsibility was in General Chemistry, since the large beginning class was divided into two sections. He also taught Chemistry 101-102, non-major courses, and at times Quantitative Analysis. Mr. Golding remained at DePauw until the 1963-64 academic year, when he received a National Science Foundation Fellowship to Purdue University. He left DePauw at the end of the year to accept a position in Shimer College, in Illinois.

In 1959 Dr. Cook became more involved in the national effort to improve the teaching of chemistry in the smaller colleges when he became Chairman of the Visiting

Scientist Committee of the Division of Chemical Education. He and Dr. Ricketts were members of the American Chemical Society Visiting Scientist Program and were assigned as lecturers to high schools and colleges during the 1960's. Dr. Ricketts obtained his first sabbatical leave in 1960-61 and spent the second semester at Case Western Reserve University, where he wrote the Instructor's Guide to the Problems in Physical Chemistry, by Gordon Barrow and also the Instructor's Guide to Physical Chemistry by Eric Hutchinson. Dr. George L. Clark, who had been on the staff with Blanchard in 1918, took over Dr. Ricketts' class in Physical Chemistry during the spring of 1961.



John W. McFarland

John W. McFarland (B.A. DePauw, 1949 and Ph.D. from Vanderbilt University, 1953) joined the Department in the fall of 1961 as an Associate Professor. He had been a Postdoctoral Fellow at M.I.T. in 1953-55 and then had spent the years 1955-61 with the DuPont Company as a Research Chemist. He was given courses in General Chemistry and Organic Chemistry for his responsibility plus the direction of research students in his developing program of Sulfonyl Isocyanates and Sulfonyl Isothio-cyanates.

During the 1961-62 academic year Dr. Cook was on sabbatical leave with the National Science Foundation in Washington, D.C., as Associate Program Director in the Division of Scientific Personnel and Education. He maintained his association with the NSF for some years, serving as a consultant.

In 1962-63 Dr. Howard Burkett obtained a Petroleum Research Foundation grant to support his second sabbatical leave for research at the University of Washington in Seattle with Dr. W. M. Shubert, and Dr. Jervis Fulmer had a sabbatical leave the second semester of this year to gain information about new laboratory construction in other schools which might be helpful to DePauw. This study was the first step toward the construction of the Julian Science and Mathematics Center later in the decade.

In September, 1962, Dr. Eugene P. Schwartz, with a B.A. (1955), M.S. (1957), and Ph.D. (1959) from Case Western Reserve University, joined the staff to teach Physical Chemistry and Advanced Analytical Chemistry. He had just completed a year of research at Moscow State University, where he worked in the Kafedra of Electrochemistry under Professor A. N. Frumkin. In 1961 and 1962 two publications in Russian journals reported this work. With the appointment of Dr. Schwartz, Chemistry had become a seven-man Department.

During the 1960's the many creative activities of the Chemistry Department were most significant. The federal government, through the National Science Foundation, gave DePauw a new source of grants-in-aid. To keep pace with the new needs of instrumentation, several NSF matching grants provided for an IR-10 Infrared

Spectrometer, Varian and Carle Gas Chromatographs, pH meters, Mettler balances, a Rudolph Model 80 Polarimeter, Spectronic 20 Spectrometers; and in 1968 the Hitachi Model R-20 NMR spectrometer was purchased with University funds.

When the new Science and Mathematics Center was completed in 1972, a National Science Foundation COSIP Grant was secured to purchase needed instruments for the sciences. Chemistry obtained several important items, including the Cary 14 Spectrometer, the Dipole Moment equipment, and matching funds for the NMR. A later NSF equipment grant helped add Spectronic 20's, a Conductivity Bridge, Photovolt pH meters, and Geiger Counters and Scalers for the updated general chemistry laboratory.



Eugene P. Schwartz in an Honor Scholar Seminar

The development of the summer research program, to mesh with the academic year curriculum, was given needed assistance in the early 1960's when the NSF initiated the Undergraduate Research Participation Program. In 1963 Professor Cook directed the first U.R.P. summer research work at DePauw with a grant of \$6,720 to support six student participants. During the summers 1963-69 and 1971 and the academic year 1966-67, 44 students took part in these programs. Of this number 33 are known to be still practicing chemists; two became physicians, while one, Dr. Don Schauwecker, first received the Ph.D. in chemistry and later the M.D.; and another, Dr. Ann G. Carmichael, completed the M.D. degree and her Ph.D. in history. She is now a Professor of History of Medicine at Indiana University. In addition to the NSF support of Summer Research, Dr. John McFarland received a Petroleum Research Foundation Grant of \$13,200 in 1966, which made possible the continuation of his summer research program for three years.



John A. Ricketts, Donald J. Cook,  
Jervis Fulmer, Harry L. Golding,  
and John McFarland —  
The Chemistry Department in 1963

In 1964 Dr. John Ricketts was named a member of the Governor's Commission on Secondary Education in Indiana, and he also served as Director of Graduate Studies at DePauw from 1966-69. During the decade of the 60's he produced a constant flow of research articles with the publication of eleven papers.

In May, 1964, President William E. Kerstetter announced that he had appointed Dr. Donald J. Cook and Dr. Howard B. Burkett as alternating heads of the Chemistry

Department, each to serve three-year appointments. Dr. Cook assumed this position on July 1, 1964, replacing Dr. Jervis Fulmer, who retired and became Professor Emeritus of Chemistry; and Dr. Burkett would assume the position in 1967. This was the first alternating appointment of department headships at DePauw, but within a few years the naming of department chairman was to become subject to three-year appointments.

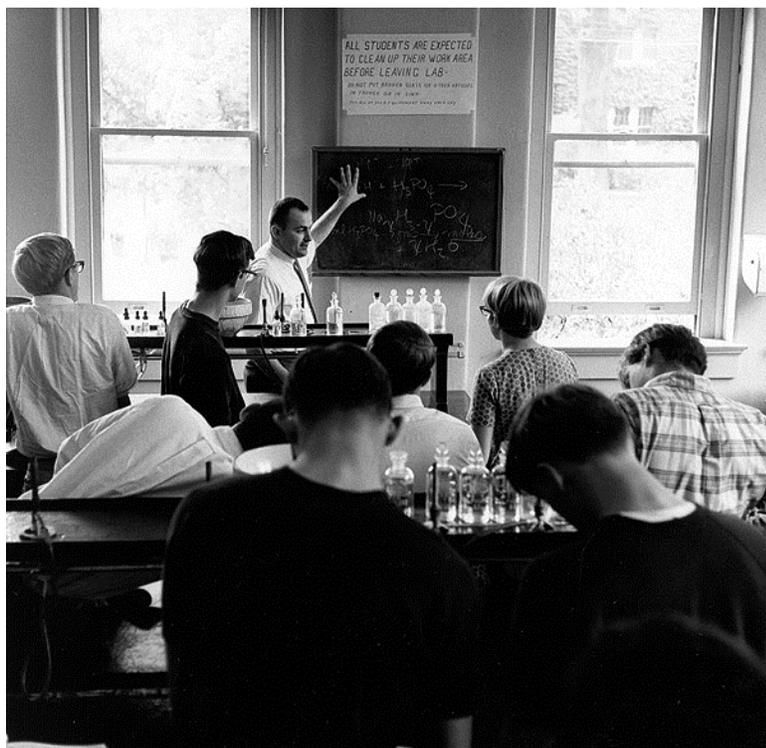
Dr. Jervis Fulmer, who had guided the Department with dedication for 19 years and had been instrumental in maintaining the strength of DePauw's Chemistry Department as well as guiding the premedical program from his early years at DePauw, continued to teach the course in Quantitative Analysis. After one year on this part-time basis at DePauw, he decided to accept the appointment as Visiting Professor of Chemistry at Berry College, Mount Berry, Georgia, and taught there for another two years. He and Mrs. Fulmer then moved to Colorado Springs, Colorado. In 1972 Dr. Fulmer returned to Greencastle to take part in the dedication of the new Science and Mathematics Center. He died on December 31, 1979, in Colorado Springs at the age of 81.

In 1962-63 and again in 1964-65 a number of changes were made in the chemistry curriculum. By 1964-65 there was a two-course sequence in Organic Chemistry for premedical and biological science majors (301-302), as well as a two course sequence for chemistry majors (303-304). Qualitative Organic Analysis was offered as a half course. There was still a course for non-majors in Physical Chemistry (308) for premedical majors, but Quantitative Analysis had now become a one semester course (210). There was also a new course for nurses, Elementary Principles of Organic Chemistry (102). With the advent of better high school chemistry courses, the one semester, Advanced General Chemistry (105), was initiated in 1963-64. The major changes were in the Physical Chemistry (309-310) sequence, which led to the advanced courses in Organic, Inorganic, and Instrumental Analysis (401, 404, and 403). The requirement of a research problem for all interested in professional chemical training was now a part of the curriculum (Chemistry 405-406).

In 1964-65 Dr. McFarland had a leave from the Department to serve as a Visiting Lecturer at the University of Illinois. During this year he prepared the manuscript for his Laboratory Text for Organic Chemistry and was able to evaluate the experimental directions. In 1969 C.V. Mosby, Co. published the manual, and it was used at a number of schools for some years.

During this year David B. MacLean was appointed as Assistant Professor of Chemistry. He had received his B.S. at Yale University in 1957 and the Ph.D. at Northwestern in 1962. His responsibility was to take over and develop the beginning and advanced work in inorganic chemistry. In addition to the regular staff of six members in 1964-65, another temporary appointee was added to the staff. In December, 1963, The Charles F. Kettering Foundation gave the Great Lakes Colleges Association \$330,000 for the purpose of sustaining six teaching internships in chemistry and six in biology for three years at some of the member colleges. The purpose of the grant was to help recruit potential liberal arts teachers to seek positions in the G.L.C.A. schools. The DePauw Chemistry Department was first involved in this program in 1964-65, when Dr. Martin Fraser (Ph.D., St. Andrews University, Scotland) was made a Visiting Assistant Professor at DePauw. In 1966-67 Dr. James A. Beres (B.S. University of Wisconsin

(1961), Ph.D. Vanderbilt (1966)) was the second Kettering Intern at DePauw. Both of these men taught classes during their stay and were able to experience the problems of teaching undergraduates. Later Dr. Fraser returned to teach in Scotland, and in 1986 Dr. Beres is now Professor and Chairperson of the Chemistry Department at Shippensburg University in Pennsylvania.



James George in 1967

In 1966-67 the permanent staff was increased by the addition of Dr. James E. George (B.S., Allegheny College, 1960 and Ph.D., University of Illinois, 1964) as an Assistant Professor. He is an inorganic chemist with his graduate research on the stereochemistry of coordination compounds. Before his appointment to DePauw, Dr. George had been an Assistant Professor at Oberlin College from 1963-66.

The years 1963 through 1967 were some of the peak years in the Department. The number of graduating majors varied from seventeen to twenty-three, and in 1965-66 there were seven graduate students in the Department. This increase in the graduate and

undergraduate programs required all the space available in Old Minshall and was one of the reasons for an increased drive for new facilities. Plans for an addition to Minshall to alleviate the crowded conditions for chemistry and physics had been discussed by the staff members with President Russell Humbert before his death in 1962. A visit by Dr. Harry Lewis, Dean of the Paper Institute in Appleton, Wisconsin, and long-time friend of members of the DePauw staff resulted in his report, which recommended a new building for the physical sciences.

With the arrival of President William Kerstetter in April of 1963, new plans had to be initiated, and they became a part of his overall program for DePauw called a Design for a Decade. It was definitely decided that a new science and mathematics center would be built and that Minshall would be abandoned. Planning was begun in 1967, and each of the chemistry staff made recommendations for the design of the building. Dr. Kerstetter's efforts to raise \$33,000,000 had resulted in \$21,000,000 by June, 1968, and the beginning of construction was set for Old Gold Day 1968. One of the



Minshall Laboratory

contributors to the Science Center Building Fund was Mr. Edgar Prevo, long time merchant in Greencastle and graduate of DePauw, who early in the drive for funds gave \$300,000. His name was given to the science library in the new building. The construction time took over three years; and as the large structure began to take shape, an era came to a close in Old Minshall. The new Science and Mathematics Center was to cost over \$7,000,000 and was constructed through funds received from alumni and friends, the Methodist Church, foundations and corporations, and through a grant from the U.S. Higher Education Facilities Act. In November, 1966 DePauw received the largest grant given that year by the Indiana Commission on Academic Facilities, \$2,580,000.

These were active years for all members of the Department, with frequent summer appointments to other schools. Dr. McFarland was a Visiting Professor at Vanderbilt during the summers of 1962, 1969 and 1970, while Dr. Ricketts was a Visiting Professor at Case Western Reserve in 1961 and also at Indiana in 1964 and at Purdue in 1967. Dr. Burkett served as Visiting Professor during the summer at Indiana University in 1965 and Stanford University in 1966. Dr. Cook became Visiting Professor at Indiana in the summer of 1963 and during other years of this decade was Director of the DePauw NSF Summer Institutes. In June, 1966, the Ford Foundation announced that DePauw University would receive a challenge grant of \$2,000,000 to aid in the academic advancement of the University. One part of that grant provided for a faculty study of the science curriculum to seek those ways to make improvements and to plan for the future. In the summer, 1967, the study was conducted for one month with Dr. Cook, Director of the Study, and Dr. Burkett the chemistry representative. In cooperation with other science representatives a number of recommendations were adopted which were useful in the subsequent planning of the new curriculum.

On July 1, 1967, Dr. Howard Burkett became Head of the Department and began to plan a chemistry conference to further investigate the needs of the Department. On January 5-6, 1968, ten industrial chemists met with the DePauw staff to spend two days considering the needed curriculum changes the Department might consider. The conference members included Dr. Richard T. Arnold of Mead Johnson, Dr. Lloyd Beck ('41) of Procter & Gamble, Dr. Otto Behrens ('32) of Eli Lilly, Mr. Robert L. Davidson ('26) of Armco Steel Corp., Dr. Carl Hake ('48) of Dow Chemical Co., Dr. Percy L. Julian ('20) of Julian Laboratories, Dr. Emmett Kaelble ('53) of the Monsanto Co., Dr. Jerome Martin of Commercial Solvents, Dr. Glen A. Nesty ('34) of Allied Chemical Corporation, and Dr. Bernard M. Sturgis ('33) of E.I. DuPont de Nemours. Some of the results of this conference will be reflected in the course changes to be recorded later, but probably the most significant result of the meeting was the organization of the DePauw Association of Chemists. All graduates and staff members of the Department are members of the Association. In 1967 the first listing of the Alumni was prepared by Dr. Cook and was distributed. The last directory was sent out in 1983 with 606 living graduates listed.

To complete the activities of the 60's, one must note that several significant changes occurred. Dr. MacLean who joined the Department in 1964, left DePauw in 1967 to join the chemistry department of Gustavus Adolphus College in Minnesota, and the Department reverted to six staff members. Dr. John Ricketts was granted a leave for the second semester of 1967-68 to study at Arizona State University, in Tempe. The following year, 1968-69, Dr. Cook was granted a sabbatical leave for the first semester to

write a textbook for a one-semester course in chemistry for liberal arts students. In the spring, 1974, his book, Elements of Chemistry was published by the Van Nostrand Publishing Co.

In 1968 a new staff member, Dr. John R. Kuempel, B.A., Beloit College (1963) and Ph.D., Indiana University (1967) joined the Department as an assistant professor. His responsibility was in the field of analytical chemistry and instrumentation. This appointment brought the staff back to seven members and was the best balance of abilities yet obtained.

As a result of the 1968 Conference a number of changes occurred in the curriculum. One course in General Chemistry (Chemistry 111) became the first course in a core curriculum. Organic became Chemistry 201 and 202, and a lower level Inorganic Chemistry (203) was established. One semester of Analytical Chemistry (211) and 1-1/2 courses in Physical Chemistry (309 & 310) were initiated, with 310 being the laboratory course. The significant changes were in the advanced courses: Chemical Instrumentation (403), Advanced Laboratory (404), Research (405), Kinetics and Mechanisms (407), Structure and Spectroscopy (408), Bonding Theories (410), and Special Topics (421-422). This curriculum continued until 1974, when there was a return to the two semester General Chemistry and Physical Chemistry became a two course sequence. However, the advanced courses remained as designed.

In 1969-70 Dr. Schwartz was on a sabbatical leave for the second semester to complete the writing of a chapter in the book The Primary Battery, Vol. 1, published by John Wiley & Sons. He also was the co-author with Dr. Ernest Yeager of the chapter, Fundamental Aspects. When Dr. Cook again became the Head of the Department in 1970, Dr. Burkett spent a sabbatical year at the NaKa works of Hitachi Company in Japan, where he did research in the applications of NMR techniques to organic structure determinations. In the fall semester of 1970 Dr. John Kuempel was granted a special leave to serve as Associate Director of the G.L.C.A. joint program with the National Laboratory in Oak Ridge, Tennessee; and in the spring semester Dr. John McFarland was granted a leave, making it possible for him to accept an appointment as a Visiting Professor at the University of Groningen, The Netherlands.

During the summer, 1971, Dr. John Ricketts directed the NSF Institute for talented high-school science students, (SSTP) with help from Doctors Schwartz, George and Paul Kissinger of the Physics Department. In the 1971-72 year the DePauw American Chemical Society Affiliate, which had been recognized on February 25, 1949, with a citation signed by the President of the A.C.S., Linus Pauling, was selected as one of the outstanding chapters in the country. Dr. James George has acted as the sponsor of the chapter since his appointment to the staff in 1966.

When the month of May 1972 was over, the last chemistry lectures in Old Minshall Lab had been given, and an era of 70 years came to an end. In July, 1972, the author wrote to the Chemistry Alumni, "You also have your memories of long hours spent in the old building...great teaching and outstanding chemists were part of the proud history of Minshall Lab and will always remain so." And so the Department prepared for the move into the new quarters - but not without some sadness. Minshall

Laboratory had carried within its halls many memories of past associations with friends and staff.



Columns from Old Minshall Laboratory as they stand today between East College, the Memorial Student Union, and the former site of Minshall Laboratory

corks" or "There ain't any test tubes with numbers on them." Since 1960 Floyd "Woody" Chadd has been in charge. Small of stature but large of heart, Woody has helped all who come to his window.

Although the new Science and Mathematics Center had been built for a continuing student body of 2300-2400, in the spring of 1972 there was some concern for future enrollment of students. As a result of declining University enrollment, the administration asked Chemistry to revert to a six man staff. It was necessary that Dr. John Kuempel be cut from the staff, and in the spring of 1972 he accepted a position at Eisenhower College in New York.

#### THE JULIAN SCIENCE AND MATHEMATICS CENTER

On Old Gold Day weekend, September 28-30, 1972, a great celebration took place at DePauw with the dedication of the new Science and Mathematics Center. Dr. Percy L. Julian ('20) gave the dedication address, "Science and the Good Life of Man." He was also awarded the first McNaughton Medal by DePauw in recognition of outstanding public service. On that day in September, 1972, the building still remained without a name. It was not until eight years later that the Julian name would be added. The physical sciences and mathematics now had a most modern facility with lecture and laboratory space adequate to care for the expected science enrollments for the next 50 years. In addition, there was a self-contained science library to provide the resources needed for study and research.

During the 60's support had come to the Chemistry Department from many sources. One grant was given in 1966 by the Hercules Powder Company of

Wilmington, Delaware, for \$2,500 and was used to purchase a new conductivity bridge, several attachments for the IR-10 and to provide needed research funds. As the 1970's started, it became obvious that new sources of money must be found to support research and to secure new equipment. In December, 1970, the Eli Lilly and Company Foundation responded to a proposal from the Chemistry Department with a grant of \$2,150 for research, supplies, and new volumes for the library. As previously noted, the yearly grant-in-aid from the DuPont Company still provided a source of necessary funds until 1980, but the Undergraduate Research Participation Program of the NSF had been discontinued. In 1973, Dr. McFarland received a Research Corporation Grant for \$10,400 to support his study of Furoopyridines, and in 1975 he received a renewal of the grant for two more years. During these years the Department also had summer research support from the McCluer grants. In 1973-75 Mr. James Gutman, a DePauw graduate of 1960, and members of his family gave to the Department large quantities of chemicals, glassware, and various pieces of equipment which they had acquired from the purchase of a chemical supply house. This gift represented the equivalent of many thousands of dollars and continues to support the ongoing departmental expenses for laboratory supplies.

There were other sources of support. In 1976 the General Electric grant provided \$4,000 for the unrestricted use of the Department, and this grant was renewed in 1977-78 and in 1978-79. With this three-year support the Department was able to provide for all its needs for research and for some new instrumentation. One grant, for \$650, was received in 1979 from the Eastman Kodak Educational Aid Program to honor Mr. Robert F. Romanet, recipient of a Masters degree in 1967, who had completed five years of service with the company. One other source of funds had been initiated in 1968, when the Association of DePauw Chemists was organized. By 1972 over \$2,000 had been given by the alums to the Association. Money from alumni was used primarily to support the Seminar and Speakers Program and the publishing of the Alumni Register, which had been initiated in 1967 and updated in 1972.

Just as the staff in the 1960's had provided many opportunities for the improvement of the Department and also for its continued growth and recognition, faculty activities continued into the 70's. In 1972 Dr. Eugene Schwartz began working half-time in the Office of International Studies. He continued in this position until 1978. In the Winter Term 1972-73 Dr. and Mrs. Howard Burkett accompanied a group of DePauw chemistry majors to Hitachi City, Japan, where they learned something of the research activities in the Hitachi Company. During this same Winter Term Dr. Ricketts took a team of DePauw chemistry majors on a 3,000 mile tour from Hopkinsville, Kentucky to St. Paul, Minnesota, advertising the academic strength of DePauw's Chemistry Department. In the fall of 1973 the Department hosted the meeting of the Midwestern Association of Chemistry Teachers in Liberal Arts Colleges. Approximately 150 members of the Association came to discuss the problems of chemical education, and Professor Cook was elected president of MACTLAC for the 1975 year.

The Chemistry staff engaged in many other activities. Dr. John Ricketts had a sabbatical leave in the spring of 1975 to lecture and study at University College in Dublin, Ireland while in July, 1975, Dr. McFarland was an invited lecturer at the Fifth International Symposium on Heterocyclic Chemistry in Bratislava, Czechoslovakia, and

Ljubljana, Yugoslavia. Dr. James George was a Visiting Professor at the University of Cincinnati during the summers of 1973 and 1974, Director of Environmental Studies at DePauw in 1972, and Director of the Summer Student Science Semester for Putnam County students from 1972-78.

In 1976 Dr. Cook was elected president of the Indiana Academy of Science and gave the presidential address, "Chemistry, Science and Culture" at Valparaiso University on November 5. Earlier in the spring semester of 1976, Dr. Cook had a sabbatical leave to study some of the history of chemistry (and science) in the Near East and Europe. He and Mrs. Cook traveled from Turkey, to Greece, Italy, Germany, France and England to visit libraries and historical sites. During the fall of 1976 Dr. Schwartz was on a special leave to act as Resident Faculty Member of the Great Lakes Colleges Association Oak Ridge National Laboratory Program. While at Oak Ridge he taught a course in thermodynamics and conducted research on Fluoride Complexes of Silicon in Aqueous Solutions. In the spring of 1977 he was a Visiting Professor in the Department of Chemistry at the University of Wales in Aberystwyth. His research was a study of the far infrared and micro wave spectra of metal-organo complexes. During 1977-78 Dr. Howard Burkett had a sabbatical leave in the Laboratory of Chemistry at the National Institute of Arthritis and Metabolic Diseases in Washington, D.C.

Dr. John McFarland was on a half-time appointment from the Chemistry Department during the years 1976-79, when he also served DePauw as the Assistant Dean and Director of Interdepartmental Studies, The Experimental Division, and Winter Term. He relinquished these duties in 1979 and had a sabbatical leave in the fall semester to serve as a Visiting Professor at the University of Nijmegen in The Netherlands. He was made a Fellow in the University by the Dutch Government in 1979. In 1977 Dr. Ricketts was again the Director of the 1977 NSF Summer Program, "Chemistry-Theory and Practice," a six-week program for high school students interested in preparation for careers in sciences. Ricketts became interested in the Piaget method of instruction when he attended the 1977 NSF-AAAS Conference on Modern Methods of Teaching Science at the University of Colorado, Boulder, Colorado.

This continuing involvement of the chemistry staff with many different duties required a one-semester replacement in the spring of 1977 when Dr. Gary O. Pierson was given a semester appointment. Dr. Pierson (B.A., Hamline University, and Ph.D., Massachusetts Institute of Technology, 1973) had spent four years as Assistant Professor at the University of Petroleum and Minerals in Dharan, Saudi Arabia. He taught courses in Organic Chemistry and General Chemistry during his semester at DePauw. He later joined the faculty of Central State University in Ohio.

During the decade of the 70's the curriculum remained much the same except for the return to a two-semester sequence of General Chemistry in 1974 (103-104) and the initiation of a course in Biochemistry (Chemistry 302). The number of graduates in chemistry dropped off in the late 1960's and early 1970's, but except for an unusually small class in 1978 (four graduates) the numbers began to increase again in mid-1970.

On April 19, 1975, the DePauw community was saddened by the death of Dr. Percy L. Julian. His association with DePauw began as a student in 1916 and continued throughout his life. Dr. Julian was a product of Old DePauw. Renowned

scientist, distinguished scholar, gentleman of culture, possessing an abiding love and concern for all mankind, he truly exemplified the liberally educated man.

In the spring of 1976 Dr. Anna Julian and her children— Percy L. Julian, Jr., and Miss Faith Julian— established at DePauw the Percy L. Julian Chemistry Fund and the Percy L. Julian Scholarship Fund. The next year the members of the Chemistry Department voted to use the Chemistry Fund income to provide an Annual Memorial Lecture in honor of Dr. Julian. On April 28, 1977, the first Percy L. Julian Memorial Lecture was presented by a long-time friend of Percy, Dr. W. Montague Cobb, Head, Department of Anatomy, Howard University, Washington, D.C. The title of his lecture was "Onward and Upward." A memorial has been presented each year and has continued to the present.

In 1978 and 1979 the activities of the Department continued at a high pace, partially because of the advantages of the use of new equipment. In 1978 through the effort of Mr. John Wood, an employee of Dow Company, a Hewlett-Packard 5750 Gas Chromatograph and Recorder were received from the Dow Chemical Company, and in 1979 through the effort of Elizabeth Cooney Englbrecht ('73), the AM Multigeophysics Company of Mt. Prospect, Illinois presented the Department with an Aminco-Bowman Spectrofluorometer; and the Cities Service Oil Co. of Cicero, Illinois, gave a Beckman D.U. Spectrophotometer with a Flame Attachment.

Publications of the Chemistry faculty continued. In 1979-80 Dr. John McFarland published two papers in the Journal of Heterocyclic Chemistry on the Chemistry of Sulfonyl Isocyanates and Sulfonyl Isothiocyanates, Paper X & XI. A third paper "Reactions of N-Sulfinyl-p-toluenesulfonamid with Alcohols," was published in Tetrahedron in 1981. Dr. Eugene Schwartz published a paper on Metal Acetyl-Acetonates in the 1979 Faraday Transactions and also a paper, "Fluorosilicate Equilibria in Sodium Chloride Solutions from 0° to 60°C." in the Journal of Inorganic Chemistry in 1980. At the Indiana Academy of Science meeting in 1979, D. J. Cook with senior Larry Boardman ('79) presented a paper on "Chlorination of Several 2-Pyridones."

Activities of the Staff also continued. Dr. James George was a Visiting Professor at Indiana University in the summers of 1979 and 1980, and in 1978 he directed an NSF Institute for High School Students. Thirty-two students attended for six weeks. On July 1, 1980, Dr. John Ricketts began a special AAAS-NSF Grant at the University of Nebraska to study the application of Piaget's Model for Cognitive Development to the Teaching of Chemistry. His grant also covered the fall semester, 1980. During this year the International Business Machine Corporation gave DePauw a \$75,000 grant to strengthen the interaction of college and high school instructors. Dr. John Ricketts and Dr. Paul Kissinger directed the programs, which included a summer two-week session for high school juniors and a visiting scientist program to Indiana high schools during the academic year. The Practicum in Science Summer Session still continues. In 1982 a report of the benefits gained from this high school STEP program was published in the Journal of College Teaching.

The academic year 1979-80 brought one of the long-time staff members, Dr. Donald J. Cook, to retirement. After 35 years he retired on July 1, 1980. His Christmas letter of 1979 concerned his retirement, but it also contained this paragraph



Photo: Marilyn Culler

Julian Science and Mathematics Center  
as it looks today

about the new Science and Mathematics Center. "In May of 1972 the last chemistry lecture was given in old Minshall and an era of DePauw came to an end. For me there was a sadness in saying good-bye to the old building. And now, within DePauw's fine new Science and Mathematics Center there must be kindled a new heritage—a new spirit. It is my personal feeling that until it is given an honored name of one whose life and achievements will inspire our students that it will not truly come alive nor emanate this challenge and this spirit." A few months later President Richard Rosser and Vice President Robert Bottoms told Professor Cook they would recommend to the Board of Trustees that the Science and Mathematics Center be given the name of The Percy L. Julian Science and Mathematics Center. In the spring meeting of 1980 the Board approved the name unanimously. On Old Gold Day, 1980, the rededication of this building gave it its "honored name." It was a day of recognition for all members of the distinguished Julian Family.

When Dr. Cook retired as Head of the Department, Dr. John A. Ricketts was made the new Chairman. Dr. Cook was made Professor Emeritus of Chemistry and was to continue an active part-time teaching role until July, 1985. His replacement on the staff was Dr. A.J.C.L. Hogarth, BSc. (1973), Queen Mary College, London University; MSc. (1974), Imperial College, London University; and Ph.D. (1976), Imperial College. Dr. Hogarth was an analytical chemist with postdoctoral research at the University of Connecticut (1977) and postdoctoral research at the Pennsylvania State University (1978-80). He would teach the analytical courses and General Chemistry. He began his appointment in the fall, 1980.

In 1980-81 two new gifts were made to the Chemistry Department. In the spring of 1980 Dr. Anna Julian and her daughter Faith initiated the Donald J. Cook Scholarship to aid and encourage gifted students who plan to major in chemistry. Additional gifts to this scholarship fund have been made by a number of chemistry alumni and friends. On June 30, 1981, the Elliott Morrill Research Fellowship was established by Mrs. Juanita Morrill, the widow of the Indianapolis textile chemist and a former corporate technical research director. The grant is used to support the research of a senior chemistry major who is under the supervision of a chemistry faculty member. In recognition of this bequest one of the senior research laboratories in the Julian Center has been designated the Elliott Morrill Research Laboratory.

In 1982 the Dow Chemical Company of Midland, Michigan, gave the Department a scholarship grant to support a chemistry major for four years at DePauw, paying \$5,000 per year to the student selected for the scholarship award. After

competitive examination Maureen L. Hill was the first Dow Scholar selected. The Department also received \$2,500 per year from the Company. In 1986 the award was renewed for another four years by the Dow Company.

Two other gifts should be mentioned. In January, 1983, Dr. John Ricketts submitted a proposal to the Spectroscopy Society of Pittsburg for a grant to provide reference books, audio-visual equipment, and study programs for the student computer. The Society, through its R.K. Scott Memorial Grant Program, gave DePauw \$2,000.00 for the purchase of these items in May, 1983. On November 10, 1983, Mr. Carl H. Pottenger (class of 1928) and Mrs. Pottenger gave the Department 250 shares of Koppers Company, Inc., stock valued at \$4,500. This was a part of a larger gift given to the University by Mr. and Mrs. Pottenger as evidence of their faith in DePauw. Mr. Pottenger is a retired chemist from the Koppers Company. The money from this gift was used to purchase a small computer and accessories plus a UV-Visible Spectrophotometer.

For some years the Johnson Wax Company of Racine, Wisconsin has given support to a number of Midwestern colleges and on June 19, 1985, a grant of \$5,000 was made to DePauw from the Johnson Wax Fund, Inc. This gift was made to improve the scientific equipment of the Department and provided for the purchase of a Flow Injection Analysis apparatus to be used in the analytical courses.

Additional sources of financial aid to the Department have been the gifts made by the alumni to the DePauw Association of Chemists since 1983. Over \$9,000 has been subscribed to support the Department's distinctive seminar series. One of the features of this program is the use of alumni and others to present monthly chemical seminars. In 1984 the establishment of a DePauw Alumni Lecturer of the Year brought Dr. Keith DeArmond ('58) to the campus, in 1985 Dr. James Howard ('64) was the speaker, and in 1986 Dr. Robert Williams ('48) spent several days on campus and presented several lectures. Another event which lifted the academic sights of the campus was the awarding of a Dreyfus Foundation Distinguished Lectureship in 1982-83. In the fall semester Dr. Harry B. Gray from the California Institute of Technology spent four days on the campus as the Dreyfus Lecturer, while in the second semester Dr. Barry D. Lindley ('60), Associate Professor, School of Medicine, Case-Western University, gave a series of lectures on the importance of chemistry to the medical researcher. One of the alumni who came to the campus to deliver a seminar in 1980 was Dr. Charles A. West, class of 1949 and Professor of Biochemistry at U.C.L.A. Dr. West, a native of Greencastle, was honored by DePauw in 1981, when he received the honorary D.Sc.

The changes in the curriculum during the 80's were not as extensive as in earlier years. By 1980-81 the course, Biochemistry, was deleted, the Liberal Arts course (Chemistry 101) was dropped, and all the courses for graduate study were discontinued. By 1986 the course offerings included, besides the Elements of General and Biological Chemistry (102) and General (103-104), two courses in Organic (201-304), one course in Analytical (211) and one course in Inorganic (212). Physical Chemistry was again a two-course sequence (311-402); and a new course, Minicomputers in Chemistry (314), was a half course. Research was required for an A.C.S. major (405); and advanced courses were Mechanisms (407), Structure & Spectroscopy (408), and Advanced Inorganic (409). These were each a half course credit. A required advanced

course was Advanced Analytical Chemistry (410) for one course credit. There were no special courses in Analytical, Organic, or Physical Chemistry for majors in Premedical or Biological Science.

The activities of the staff continued at a high level. The new staff member, Lewis Hogarth, completed two papers, which were published in January, 1981. Dr. McFarland continued his sulfur research on alpha-ketosulfones, and in 1981 he received a Petroleum Research Foundation Grant of \$14,000 to support his summer research. Since 1979 Dr. Eugene Schwartz has taught half time in the Honor Scholars Program, and he became Director of the Program in 1985. In 1980-82 he taught the new freshman General Chemistry course for students planning to major in chemistry while in 1981 Dr. John Ricketts devised a set of "Learning Cycles," based on the Piaget learning theory, for the introductory chemistry laboratory. He was also responsible for preparing a Keller Plan approach to the "Q" readiness course in 1982, which prepared low-test students for the new Quantitative Reasoning requirement courses.

In May, 1981, Dr. Howard B. Burkett became Professor Emeritus of Chemistry and was recognized for his dedicated teaching over thirty-six years. He, too, was given a part-time teaching appointment for the next five years to teach organic or the advanced organic courses. In 1986, when he relinquished his teaching duties, the Department received a number of gifts from alumni and friends to establish the Howard B. Burkett Lecture in Organic Chemistry. The first lecture was given on September 18, 1986. Dr. Barry M. Trost, Professor of Chemistry, The University of Wisconsin, spoke on "The Chemist's Enzymes: Tools for Selectivity".

In 1981-82 the Department request for a replacement of Dr. Burkett was denied by the faculty manpower committee and the administration. With both Dr. Ricketts and Dr. Schwartz teaching half-time because of other University duties, the Department became a five-man staff including both Professor Cook and Professor Burkett, each on half-time appointments. In the spring, 1983, Dr. Michael F. D. Reinhard, B.A. (1978), M.S. (1981), Ph.D., (1983), all at Wayne State, was appointed for a three-year term to teach Organic Chemistry and General Chemistry. This increase in staff relieved the overload which had existed for two years.

In July, 1983, Dr. John Ricketts completed a three-year appointment as Chairman of the Department and elected to return to full-time teaching. Dr. John McFarland assumed the chairmanship. The 1983-84 academic year was a full one. Dr. Howard Burkett decided to reintroduce the "Old Qual. Organic Analysis"; Dr. George offered a new course, "Using Computers in Chemistry"; Dr. Hogarth authored two publications in the journals, presented a paper at the 1983 fall meeting of the Indiana Academy of Science, and organized an enrichment program, "Science Saturdays," for local high-school students. Dr. McFarland published one article on "A Convenient Synthesis of  $\beta$ -Sulfonylenamines from  $\alpha$ - $\beta$ -Epoxy sulfones," while Dr. Ricketts spoke on "Piaget and P.S.I" at the Indiana Academy of Science and presented lectures on the use of the "Learning Cycle" at Ball State and Purdue Universities. In the spring, 1984, Dr. Eugene Schwartz spent a sabbatical leave at Duke University, where he studied the history of technology and science.

In the fall semester of 1984-85 Dr. McFarland organized a "Chemistry Conference on the Present State of Chemical Education at DePauw." The conferees were all DePauw alumni plus the staff members. Those invited to the Conference were Dr. William Bromer ('49), Eli Lilly Company; Dr. Stephen Byrn ('66), Purdue University; Dr. John Cassady ('60), Purdue University; Dr. Richard Fulmer ('52), Cargill, Inc.; Dr. Kenneth Kirk ('59), National Institutes of Health; Dr. Emmett Kaelble ('53), Monsanto Corporation; Dr. Barry Lindley ('60), Case Western Reserve University; and Dr. Brian Wicke ('65), General Motors Research Division. The topics discussed were (1) curriculum (2) research (3) extra-classroom educational activities (4) equipment needs and sources of funding and (5) quality of students. The conference resulted in many new suggestions, including an Honors Laboratory, a greater incorporation of material with a biological base into the chemistry courses, a renewed emphasis on the value of student and staff research, and the recognition of the value of computers in chemistry. However, one alumnus cautioned, "Learn science before you give it to a computer."

As a Visiting Professor during this semester Dr. Ricketts spent a sabbatical leave at the University of Nebraska with Dr. David Brooks, continuing his study of the Piaget method and the use of programmed learning in the chemistry curriculum. In the spring, 1985, the joint petition for a chapter of the DePauw and Wabash chemistry departments to the national office of Phi Lambda Upsilon, the chemistry honorary fraternity, was granted. The installation of the Beta Omicron chapter took place on April 19, 1985 on both the Wabash campus and the DePauw campus. The initiation of 37 charter members preceded a joint banquet with the celebrants of the Percy L. Julian Memorial Lecture. Dr. Fred Hassmundt ('53), national treasurer of Phi Lambda Upsilon, assisted in the installation of the new chapter. The lecture was presented by Dr. W. T. Lippincott, former editor of the Journal of Chemical Education, on the subject, "Enriching the Science Tradition in Liberal Arts Colleges: Prologue to the New Century."

In May, 1983, Dr. Michael Reinhard, had been appointed for a non-tenure three-year term. In May of 1985 he resigned to accept a position in industry. There was no replacement for him in 1985-86.

In the summer of 1985, Dr. John Ricketts was selected to be one of the American professors to participate in the First Exchange in Chemical Education between the United States and the Peoples Republic of China. He was able to spend two weeks in China visiting a number of universities and consulting with Chinese chemistry professors.

Now comes a difficult case, that of Dr. Hogarth. During the academic year, 1984-85, Dr. Lewis Hogarth, who would successfully complete five years at DePauw by June 1985, was presented to the administration for tenure on the faculty. Dr. Hogarth had become an integral part of the DePauw staff. He was a dedicated and capable teacher who devoted many extra hours to his students. He was recognized by the students in two different years, when he received one of the Best Teachers awards. He was a respected member of the faculty and the Greencastle community. When he was endorsed unanimously by the staff of the Chemistry Department and the Faculty Committee on Faculty, there was little concern that he would not receive tenure. During the course of the evaluation and upon the request of the President and Vice-

President for Academic Affairs, outside evaluations of the candidate were made by several chemistry instructors in other colleges. In this evaluation of Dr. Hogarth the only contact between the evaluators and Dr. Hogarth was their review of his research papers, a laboratory manual he had prepared, and a number of his examination papers. On this limited background, the outside reviewers gave Dr. Hogarth a negative evaluation. This outside evaluation was considered of limited value by the DePauw chemistry staff, and they restated their approval of Dr. Hogarth.

In spite of the recommendation of his own chemistry staff and of the Faculty Committee on Faculty, following the report of the outside evaluators, the President, with the advice of his Academic Vice President, rejected Dr. Hogarth for tenure. On September 16, 1985, a letter from the chemistry staff to the alumni stated "It is with disappointment that the Chemistry Department must announce that Dr. A. J. C. Lewis Hogarth was not granted tenure at DePauw University. This is an administrative decision and was made in spite of the unanimous recommendation of the Chemistry Department that Dr. Hogarth be granted tenure."

Upon appeal by Dr. Hogarth to the elected Faculty Appeals Committee established to guarantee fairness in all decisions regarding faculty tenure and promotion, the Committee found again that Dr. Hogarth was qualified to be given tenure and recommended that the President's decision of September, 1985, be reversed. However, after the administration reviewed the Appeals Committee's report, Dr. Hogarth was again denied the tenure which had been recommended. Consequently, he resigned his position in January, 1986, to accept a position in industry.

With the resignation of Dr. Reinhard in 1985 and Dr. Hogarth in 1986, the Department was in need of additional staffing. To compensate for the loss of these two staff members, the administration now agreed to the appointment of two new tenure track instructors.

The President also authorized the purchase of several major instruments to cost approximately \$100,000. In the spring of 1986 the Department obtained a Varian NMR model 360 to replace the old Hitachi instrument, a Varian HPLC System, and a Nicolet 5DXB FT IR Spectrometer. A gift from Eli Lilly Company of a reconditioned Varian N.M.R. model T-60-A was made possible through the efforts of Byron Daugherty, a member of the class of 1979. In terms of quantity and quality of instrumentation the Department has come a long way from those first efforts of President Simpson to solicit from Indiana Methodists equipment to augment "...A small philosophical and chemical apparatus cabinet which, though not extensive, is sufficient for illustrating by interesting experiments, the more important principles of philosophy and chemistry."

In late spring of 1986 the Department was able to engage two new staff members. Dr. David T. Harvey (A.B. Knox College, 1978, and Ph.D., North Carolina University, 1980) was named an Assistant Professor with teaching responsibilities in General and Analytical Chemistry. He had taught at Stockton State College in New Jersey for four years. The other appointment was Dr. Bryan Hanson (B.S. California State University, 1981, and Ph.D., University of California: Los Angeles, 1984). He completed a postdoctoral appointment at Oregon State University in the spring of 1986. His

teaching duties include Organic, Biochemistry and General Chemistry. He was also given the rank of Assistant Professor.

The spring semester of 1986 closed with anticipations of a new beginning in the fall. Dr. John McFarland was appointed chairman for another three years; Dr. Ricketts continued to present papers on "Individualized Instruction and Reasoning and Higher Education" in conferences at Rutgers University and Boise, Idaho; Dr. Schwartz continues as Director of the Honors Program; and Dr. George plans a sabbatical at the University of Florida in the spring of 1987.

#### A FACULTY OF DISTINCTION

To write the early chapters of this history was the least difficult. It is easier to tell the story of only one professor of chemistry within a particular era rather than to be concerned with three or four or six different individuals. And then there is a distinct advantage to see the view from a distance rather than to be involved within the same picture.

There was a transition from the Blanchard era to the present and the one who guided the Department in this change was Dr. Jervis M. Fulmer. In 1945 he was the one remaining chemistry faculty member who had experienced the increasing surge of chemistry in the 30's and the problems of the war years. During his tenure of headship until 1964, Jervis Fulmer stood firm for a strong Department and the best of standards for chemists and premedical majors.

The Department these past 40 years has been strong because of its unity within diversity. In addition, there was a stability of staff which made it possible for six instructors to work together effectively. Although each had different strengths and diverse abilities, the recognition by each one for the qualities in the others resulted in the single purpose of giving DePauw students an unusual experience in the study of chemistry. Within the daily activities of the staff there were disagreements, but there was always respect. Each was — or now is — an individual of talent.

Howard Burkett would identify himself as a Putnam County farm boy. He grew up just north of Greencastle and east of Morton on U.S. Road 36. Possibly his early duties on the farm helped him develop the ability to build and repair laboratory equipment. It could be said that if he had lived in the Asbury days, he might have been another Downey or Joseph Tingley. For the past 41 years his students have studied organic chemistry under one who is the equal of the best in the country.

A dynamic and candid individual is John Ricketts. Since 1952 he has been a leader in the design and development of new goals and courses within the Department. Since his first class day, his abilities in mathematics and theoretical chemistry have given DePauw chemists the best in physical chemistry. Today he still writes proposals for grants for research or new student programs. He has never been content to be a static teacher, nor has he yet reached equilibrium. Many times he has been the spark which has ignited a new vista in the Department. He is the present Simeon Smith Professor of Chemistry.

John McFarland is a soft-spoken individual who left DePauw with a B.A. in 1945 and then came back in 1961. Since his first years on the staff he has won research grants to support his program of research. Over the years he has developed a field of organic research which has brought him international recognition. In addition he was responsible for a number of DePauw programs when he served as Assistant Dean, and he now leads the Department as its current chairperson. How he finds time also to contribute to the Greencastle community as a Methodist Lay Preacher can only be known by another busy person.

Gene Schwartz is a quiet and scholarly man who does not easily enter into debate or quickly express his opinions. Rather, he considers the pros and cons before making his judgement. His research program also follows the pattern of careful and complete evidence before he interprets the data to make the solution of the problem. In recent years his direction of the Honor Scholars Program has served DePauw in the highest academic tradition as the search for the best students goes on.

Jim George is a genial person who each year guides the A.C.S. Affiliate Chemistry Club through new activities and new seminars. A native of Pennsylvania with a Ph.D. from Illinois and prior experience at Oberlin before coming to DePauw, he brings the perspective of the Inorganic chemist to the classroom. His program of synthesis of many complex ion heavy metal salts gives much color to his laboratory.

Can one say anything about himself except to note that this author came to DePauw in 1945 proud to be a member of the faculty of a prestigious institution. In his 40 years he worked hard, did his share of teaching, research, and the many necessary academic activities which help keep the school strong. He left his duties in 1985 expressing an abiding love for Old DePauw.

## Epilogue

As I finish the writing of this history of 150 years of chemistry at DePauw I am left with several deep and lasting impressions, which I would like to share with you.

The professors of chemistry who have taught at DePauw have all been men of unusual scholarship possessing a high commitment to the teaching profession. But beyond this they have been men of breadth and vision which they have communicated to their students to an unusual degree.

The students who came to them were also of unusual caliber, and through these long years they have been touched by their professors' minds and also by their spirits. DePauw alumni have contributed to our national life and to DePauw in outstanding ways.

This history of chemistry would not be complete without mention of those many foreign students who have studied at DePauw and majored in chemistry or premedical science. Some have remained in this country to become highly productive citizens and others have returned home to enrich their native land.

I have also been greatly impressed by the many "Friends of Chemistry" too numerous to record here. Individuals and corporations have given a steady stream of gifts which have sustained research, an outstanding library, and sophisticated instruments which have made possible a highly productive Department.

I believe chemistry to be one of the "Crown Jewels" of the liberal arts education. It provides the discipline, the development of creative and abstract thinking, and the breadth which have allowed our graduates to move on to high achievement. It is my sincere hope that chemistry and science will continue to be nurtured at DePauw as she moves toward a new century.

## In Appreciation

I wish to take this opportunity to thank those who have made the publication of this history possible. First, I express my deep appreciation to my wife, Marion, for her assistance in the writing and polishing of the manuscript, also to the Chemistry Department secretary, Mrs. Roberta Perry, for her skillful and patient typing and correcting through several versions.

Our DePauw Archivist, Wesley Wilson, proved helpful and enthusiastic in many ways. Dr. John Baughman, DePauw Historian and Professor of History, read the finished manuscript and encouraged its publication. I deeply appreciate the skilled editing by Dr. Arthur W. Shumaker, Professor Emeritus of English.

And, lastly, my deep personal appreciation is extended to the members of the staff of the DePauw Chemistry Department for their unfailing support, suggestions, and encouragement through the months of research.

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*Editor's Note: The plaque that Jack hoped for and described in his forward did indeed come to fruition. The inscription on the plaque reads:*

Minshall Cornerstone  
On This Site Once Stood Old Minshall Lab  
(1901-1973)  
It Was Home To The Chemistry and Physics Departments  
Through Its Doors Walked DePauw Men and Women  
Who Went Forth To Enrich The World.

*Jack was of course responsible for the creation of the monument, and he also rescued the columns from Minshall Laboratory which had spent many years in a field near campus. They now adorn the garden area between the renovated Union Building, East College, and the former location of Minshall Laboratory. More recent information about the Department of Chemistry can be found at the Department's web site at <http://www.depauw.edu/acad/chemistry/index.htm> Professors Ricketts, McFarland, Schwartz and Burkett have retired. I am sorry to report that our colleague and good friend James George passed away in October 1999 as a result of a brain tumor.*

Bryan Hanson  
Chair  
January 2001