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WILLIAM ALBERT NOYES, JR.

1898—1980

A Biographical Memoir by
JOHN M. WHITE AND PAMELA J. COOK

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April 18, 1898–November 25, 1980

BY JOHN M. WHITE WITH PAMELA J. COOK

WILLIAM ALBERT NOYES saw himself, his memoirs reveal, as *A Victorian in the Twentieth Century.* A man of both discipline and imagination, he believed that his were especially interesting times, when science was advancing rapidly and the political face of the world was changing. He was not only an eminent photochemist, but a scholar with broad interests and a liberal philosophy. Albert Noyes considered himself, at bottom, a "university man," but his life encompassed numerous activities and enterprises outside the realm of academics. He died in Austin, Texas, on November 25, 1980.

The research career of Albert Noyes, pioneer of photochemistry, is well-documented in over 200 publications. His early work dealt with the identification of primary photochemical events and their connections to spectroscopic facts. The classic text with Philip Leighton, *The Photochemistry of Gases* (1941), describes much of this, and other work, up to 1941. Noyes's later work centered on the photochemistry and photophysics of ketones, particularly acetone, and simple aromatic compounds. Toward the end of his career, he became interested in the photochemistry of polymers, which he correctly thought would be at the heart of the next generation of photochemical research.

Beyond his laboratory work, Noyes's scientific career reflects constant attention to professional activities with the U.S. government, with the American Chemical Society, with universities, and with a number of industrial laboratories. His long-standing association with Argonne National Laboratory is, to this day, noted with a prominent photograph in the lobby of the Chemistry Division Building.

William Albert Noyes, Jr., was born April 18, 1898, in Terre Haute, Indiana, to William Albert Noyes and Flora Collier Noyes, their only child to survive beyond early childhood. His father was a chemist and, at the time of Albert Noyes's birth, a professor of chemistry at Rose Polytechnic Institute. Albert Noyes said that he inherited his love of music and his aptitude for foreign languages from his mother, who died in March 1900 after years of poor health. Albert's father was much involved with the burgeoning American Chemical Society and served as the editor of their *Journal* beginning in 1901. Also in that year he remarried, and Albert got a stepmother and, in 1904, a brother, Charles.

In 1903 Albert's father accepted a position as chief chemist with the new Bureau of Standards in Baltimore. As he waited for the buildings to be completed, he did research at Johns Hopkins University. He often brought his son to his laboratory, and young Albert began to meet prominent chemists and scientists. "To list the great scientists I met as a boy," he later wrote in his memoirs, "would be like giving a listing from Who's Who." His father was offered the chairmanship of the Department of Chemistry at the University of Illinois, and the family moved to Urbana in 1907.

In Baltimore Albert had been a poor student. But in Urbana, thanks to some good teachers and, he said, to the strict discipline imposed by his stepmother, he began to improve. He graduated from the eighth grade near the top of his class. In high school his first love was history, much

of which he read on his own initiative. He played baseball and ran on the track team but claimed that he was never very good. During his last year of high school Albert's stepmother had a stroke, and she died in August 1914.

Albert had begun his senior year undecided about his future, torn between history and science. His physics teacher, Lloyd Howell, was a "truly inspiring teacher, one who permitted students to work problems in their own ways." This suited Albert, and he was convinced that he belonged in the sciences. In the fall of 1914 he went off to Grinnell College in Iowa to study chemistry. Always a lover of the railroads, he took a train trip from Iowa to California with his brother Charles in the summer of 1915. Later that year, his father married again; his new wife, Katharine Macy Noyes, was to be a good friend to Albert. She and Albert's father had two sons, Richard and Pierre, both of whom also followed their father into the sciences and academia.

At the end of his sophomore year, Albert was awarded a junior scholarship at Grinnell, but he had already decided to transfer to the University of Illinois. He spent the summer training as a commercial radio operator at the Marconi Company's school in New York City. Later that fall, during the election in which Woodrow Wilson won the presidency, Albert was called upon to help receive returns at the local radio station. At school he was taking a heavy load of chemistry coursework, and by the end of the year he was only twenty-one hours shy of the graduation requirement. World War I had intruded very little on his academic and social life, but by spring 1917 Albert had been asked to join the Signal Enlisted Reserve Corps of the U.S. Army, probably because he held a radio operator's license. In April, a week after the United States entered the war, Albert enlisted over his father's protests. June found him working as a radio operator on the *S.S. Warrior* along the Atlantic coast, and

then on a series of passenger ships before being called to Camp Sherman for training with the 83rd Division in a Field Signal battalion. On June 12, 1918, the *S.S. Megantic,* with Albert Noyes aboard, sailed for Europe. In France he served as both interpreter (his French was very good) and radio operator, and he retained vivid memories of the time he spent near the front and the bombardments. In 1969, while a visiting professor at the University of Nancy, he revisited the Officers Training School in Langres, where he had been commissioned a Second Lieutenant on Armistice Day, November 11, 1918.

Albert was extremely fond of Europe, and he decided to stay in France and pursue advanced studies at the Sorbonne. Early in 1919 he began working in electrochemistry in Henry Le Chatelier's laboratory. In Paris he met Sabine Onillon, the "nice young lady" he would later marry, and settled down to his studies. He still found current events immensely interesting and followed closely the peace talks and the negotiations for the Treaty of Versailles. After two years at the Sorbonne, he received his doctorate and returned to the United States. He spent a year at Berkeley working as a teaching fellow under Joel Hildebrand and doing research with George Gibson on electric discharge through gases. In June 1921 he and Sabine were married at his father's home in Urbana. They returned to Berkeley, where Albert had been elevated to the position of instructor.

The University of Chicago lured Albert Noyes back to the Midwest in 1922. Here he had complete charge of the quantitative analysis course. He worked very hard during his seven years at Chicago, with little time for research, which was wedged into weekends and late nights. He made a number of friends there, including Robert Milliken, and was proud of the fine students he supervised, among them Louis Stevenson Kassel and William E. Vaughan. Then Brown

University offered him a faculty position, and he and Sabine moved to Providence in 1929. Their son Claude was born there in December. Albert found the department well run and the work satisfying. The Noyes family traveled extensively in Europe during summer vacations, and in 1937 they spent several months at Cambridge University where he worked with R. G. W. Norrish. Late in the decade, he and his friend Philip Leighton began writing a book on photochemistry; little was yet available in this interesting field, and Albert Noyes had acquired a reputation as a leading photochemist during his years at Brown. The book appeared in print, as Noyes noted in his memoirs, the week before the Japanese attacked Pearl Harbor.

The University of Rochester made him an excellent offer in the winter of 1938 and he accepted, becoming head of the department of chemistry and initiating a number of changes that would strengthen the graduate program. Then the Second World War began. Although the United States had not yet entered the fray, the country began to organize for war. Albert was asked to attend a meeting of the National Defense Research Committee (NDRC) in October 1940 to consider problems related to the war. As a result of this meeting he was to be active in defense work for many years.

It was inevitable that Noyes would become so deeply involved in government work: His interest in the world political scene was always intense and acute, and his scientific acumen was well established. Initially, he served as a liaison between the NDRC and universities doing defense research. Early in 1941 he visited the English office of the NDRC with a small group of scientists. He stayed at Salisbury and spent several weeks at the Experimental Station at Porton studying the use of gas and gas masks in combat, "learning the practical difficulties of bridging the gap between labo-

ratory and production." The NRDC's Chemistry Division had many contracts with universities, and work was proceeding rapidly. Then came Pearl Harbor. William Albert Noyes, Sr., had died just several weeks earlier, and his son said that in some ways it was best that his father, a lifelong worker for world peace, had not had to witness the devastation of Pearl Harbor.

In 1942 the NDRC, the Committee on Medical Research, and the Office of Field Service merged into the Office of Scientific Research and Development, and Albert Noyes was named head of the Chemical Warfare and Smoke Division. His duties required a good deal of travel in the United States, Europe, and even Australia; when he was at home he worked six-and-a-half day weeks, still had duties at Rochester and, remarkably, served as editor of *Chemical Reviews*. His memories, however, were less of the drudgery than of the politics and personalities of the time, and vivid recollections fill several chapters of his memoirs. During and after the war, he was active in the International Council of Scientific Unions and, especially, UNESCO. Not until the war ended did his schedule ease up, and even then he remained active in government work until his move to Austin, Texas, in 1963.

When he returned to Rochester after the war, Albert had a number of offers from other universities but chose to stay on as head of the chemistry department. In 1952 he was named dean of the Graduate School and in 1956 dean of the College of Arts and Sciences.

During the spring of 1962, Noyes's good friend Professor George Watt of the University of Texas at Austin wrote asking whether he might be interested in a position there. Noyes was approaching his sixty-fifth birthday and, though his special professorship would have permitted him to stay on at Rochester, he felt strongly that "after retirement a

person should not breathe down the necks of his successors." He and Sabine spent a semester in Austin, found the climate and the intellectual atmosphere to their liking, and moved to Texas permanently in the summer of 1963. There Noyes was active in recruiting new faculty in physical chemistry, as well as maintaining an active research program and teaching undergraduates. He retired to professor emeritus status in 1973.

Albert Noyes was elected to the National Academy of Sciences in 1943 and to the American Philosophical Society in 1947; he was awarded the Priestley Medal in 1954 and the Gibbs Medal in 1957, and in 1976 received the ACS Charles Lathrop Parsons Award. Clearly, his contributions to the field of photochemistry were widely recognized and appreciated. In addition to his editorship of *Chemical Reviews* from 1939 to 1949, he was editor of the *Journal of the American Chemical Society* from 1950 to 1962 and edited the *Journal of Physical Chemistry* from 1952 to 1964, where one of his goals, successfully attained, was to raise the theoretical level of the journal.

F. A. Matsen, who had been at Texas for some years when Noyes arrived there, considers him "the best thing that happened to physical chemistry at the University of Texas during my tenure. He brought in strong leadership and a real ensemble spirit." Noyes organized monthly physical chemistry dinners where faculty met to discuss problems of general interest. But what Matsen remembers best is that "if he met you in the hallway, he wouldn't ask, 'How are you?'—he'd say, 'Why is the intersystem crossover in benzene so rapid?' He was always thinking about science." Noyes was also a superb recruiter, Matsen recalls; he located potential faculty members while they were still graduate students, then kept in touch as they finished school and became available for faculty positions.

Norman Hackerman, former president of both Rice University and the University of Texas at Austin, and now professor emeritus at UT-Austin, met Noyes for regular Sunday morning talks. Noyes enjoyed conversation, and one topic of great concern to him was the war in Viet Nam. The two shared many hours of discussion in the sixties and seventies, on the war and numerous other subjects, Hackerman remembers. His stress on discussion as a learning tool carried over into the classroom: Noyes's enormously popular course, "Science in Government and in International Affairs," required each student to meet with him individually for face-to-face discussion.

Early in 1966 Noyes, whom I had never met, dropped into my lab at Caltech, unannounced. Fortunately, I was at work, and he proceeded to quiz me about what I was doing and why. In less than five minutes, he sized up the situation and finished by asking me if I knew anything about Badger's Rule. A few weeks later, when I was invited to Texas to give a research seminar, I understood what he had been doing: As I learned, he recruited by roaming the halls and labs of institutions, and he had been pointed my way by someone at Caltech. Thankfully, I knew something about Badger's Rule!

This was not the end of the Noyes influence on my career. When I arrived in Austin in February 1967 to take up my faculty position, two excellent students, Gene Sturm and Gerry Wood, signed on with me within a few weeks. They had been encouraged to look into "that new young buck down the hall." Noyes's advocacy on my behalf with students and with the "powers" of the department set an excellent example that all of us would do well to follow. There were only a few things that Noyes would not tolerate—one of the more famous was the playing of radios during working hours.

I had the distinct pleasure of co-supervising Noyes's last Ph.D. student, Ardi Lee, and from that work we published a paper on one of Noyes's favorite topics—energy transfer in electronically excited benzene. Noyes's ghost is still around my own office: I have his desk and chair, and I hope that someone will take them from me with as much gratitude as I received them from William Albert Noyes, Jr.

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