bonding is not essential to the success of the S_N2' displacement by amines on allylic halides by employing the reaction of trimethyl amine (which has no hydrogen atom to engage in hydrogen bonding) with α-methylallyl chloride in acetone. Both normal and abnormal products are formed by S_N2 and S_N2' displacements, respectively. No rearrangement of starting material or products occurs. The kinetics are second order. Heats and entropies of activation have been calculated for both the S_N2 and the S_N2' displacements.

Intellectual Ability of Students Entering Different Fields of Science

Dael Wolfle

Commission on Human Resources and Advanced Training National Research Council

High school grades. Of 1050 students who earned Ph.D.'s in science, 21% were high school valedictorians and 62% were in the top 10% of their classes. The fields ranged from physics and mathematics, with 77%, to agriculture, with 48%, from the top 10%.

Scholastic aptitude tests. Among college graduates, average scores for engineering, language, physical science, and psychology majors are above college averages. Biological science, social science, and arts majors about equal college averages. Agriculture, business, and education students are below average.

Twelve per cent of science Ph.D.'s were in the top 1% and 52% in the top 10% of college freshmen. Percentages from the top 10% are: physical sciences, 60; earth sciences, 52; biological sciences, 40; and agriculture, 26.

These differences disappear among the most eminent research scientists. Roe found that eminent physicists, biologists, and psychologists and anthropologists all averaged far above the typical Ph.D., but tapered off to an ability level only moderately above the undergraduate average. Interest and persistence can produce research eminence from a wide range of intellectual ability, but typically the most eminent come from among those who make very high test scores. The distribution of such men among the sciences is uneven.

The Anomalous Transparency of Thick Crystals to X-Rays

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The anomalous transparency of some thick crystal specimens to a beam of x-rays producing "Laue case" diffraction was first observed by Borrmann. Quantitative experimental studies of the effect, using calcite crystals, have recently been made by Borrmann and by H. N. Campbell.

The complete solution for Laue case diffraction in absorbing perfect crystals is capable of explaining the observed phenomenon. In order to make a quantitative comparison between theory and experiment it has been necessary to modify the solution so as to fit the specific experimental procedures used by Borrmann and by Campbell. This modification has been made, and the result is presented in the form of an expression for the effective absorption coefficient.

The usual absorption coefficient of calcite for x-rays of wavelength 1.54A is 193 cm^{-1}. The experimentally measured and the theoretically calculated values for the effective absorption coefficient in the region of anomalous transparency are given in the table below.

Crystal thickness (cm)	Calculated (cm^{-1})	Measured (cm^{-1})	Experimenter
0.040	79	86	Campbell
.212	30.5	30.2	Borrmann
0.271	28.6	27.7	"

William de Berniere MacNider: 1881–1951

W. C. George

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WILLIAM DE BERNIERE MACNIDER, son of Virginius St. Clair and Sophia Beatty (Mallett) MacNider, was born in Chapel Hill, North Carolina, June 25, 1881, and died in Chapel Hill, May 31, 1951. He received his elementary education in the schools of his home town, and his college and professional training at the University of North Carolina. After three years of study in college and the preclinical Medical School at Chapel Hill he transferred to the clinical school of the university that had just been established at Raleigh. He graduated there with the first class of young men to receive the degree of Doctor of Medicine from that institution. His professional education was extended during subsequent summers at the University of Chicago and Western Reserve University.

Throughout most of his life Dr. MacNider was a member of the faculty of the University of North Carolina, being successively assistant in biology (1899–1900), assistant in anatomy (1900–1902), assistant in clinical diagnosis (1902–1905), professor, Kenan professor, and Kenan research professor of pharmacology (1905–1950). He retired as professor emeritus in 1950. From 1937 to 1940 he was dean of the Medical School.

Dr. MacNider's achievements and the force and charm of his personality were recognized by honorary degrees from Davidson College and the Medical Col-

lege of Virginia, by memberships and official posts in scientific and social groups, and by medals and lectureships. He was a member of the American College of Physicians, the National Academy of Sciences, the American Philosophical Society, and many other scientific organizations. He served as president of the American Society for Pharmacology and Therapeutics, the Medical Society of North Carolina, the Elisha Mitchell Scientific Society, the Society of Experimental Biology and Medicine, the International Anaesthesia Research Society, and the Gerontological Society. He was awarded the Gibbs prize of the New York Academy of Medicine, the Research Medal of the Southern Medical Association, and the Kober Medal of the Association of American Physicians.

Dr. MacNider's principal contributions to creative scholarship may be grouped into five categories: (1) The production of various forms of acute and chronic nephritis, with cytological study of the types of injury and of the processes of repair; (2) disturbances in the acid-base balance in the blood in experimental nephritis during anesthesia and intoxication by salts of heavy metals; (3) the influence of lipoid accumulations within renal cells upon the susceptibility of the cells to the toxicity of anesthetics, together with demonstration of the ability of alkalies or glucose to decrease that susceptibility; (4) studies of the factors of age in the response of animals to normal and abnormal influences; and (5) evidence that, when certain epithelial tissues are severely injured by toxic agents, the succeeding repair process forms a typical, yet functionally effective, kind of cell with an acquired resistance to the chemical agent of injury and other agents of different chemical order.

As the son and grandson of a physician, and with a home in Chapel Hill at a time when the ferment of modern science was becoming active there, Will MacNider could attribute his interest in medical science to heredity and environment. As a boy he was interested in nature, and as a young undergraduate he acquired an enthusiasm for science. He once said that his enthusiasm was sparked by the study under the microscope of a living kidney tubule of an earthworm. Many another young student has been thrilled by the sight of life in operation on the cellular level, but for young MacNider the thrill was seed in fertile ground. The spectacular sight of the earthworm's nephridium fired him with a passion to penetrate the secrets of organs, of cells, of tissue fluids, of organisms—to devote a lifetime of research principally to a study of the function and pathology of the kidney. Although this line of research was never abandoned, his interests broadened to encompass an interest in the fundamental nature of the vital processes of organisms and their philosophical implications.

He was fortunate in early coming under the stimulating influence of some of the inspiring pioneers of science of fifty years ago. H. V. Wilson and Richard Whitehead, of Chapel Hill, S. A. Matthews, of Chicago, G. N. Stewart and Torald Sollmann, of Cleveland, and Thayer and Osler, of Johns Hopkins University, were men with whom he was associated, and from whom he drew inspiration and stimulus during his early years. His own eagerness and industry in the exciting search for new truth contributed largely to the intellectual climate of his own university during the fifty years that he was a part of it.

The list of his publications supplies ample testimony to his untiring activity and his wide interests. His contributions to science and teaching are on deposit in the medical library. They consist of twenty volumes of bound reprints, a gift from him to the library about a year before his death. His interest in the library was further demonstrated from time to time by gifts of books and journals, by the gift of his extensive collection of reprints from investigators all over the world, and by the bequest in his will of the scientific books remaining in his considerable library.

Although he valued highly the friendship and acclaim of his professional colleagues and contemporaries, his greatest reward was the esteem and affection in which he was held by students that passed under his tutelage. His zest for learning could not make a recluse of him, because it was accompanied by an equal zest for companionship that drew students to him in lifelong friendships.

Research and teaching occupied most of his time and energies, and yet enough was left over for a live and active interest in his home, which was the center for much pleasant hospitality. Work in his garden filled the place that sports fill in many men's lives. Gifts of flowers to neighbors and local friends were many and frequent, and many acquaintances throughout the country have had their hearts gladdened and their gardens beautified through gifts of flower seeds from his garden.

Throughout his career he remained profoundly interested in the methods and problems of medical education and in the practical, as well as the philosophical, implications of scholarship. In the council chamber and committee room he was a forceful exponent of his views, and his opinions were sought and weighed with interest by antagonists, as well as by supporters.

Although intensely interested in his own thoughts and his own affairs, Will MacNider had a keen interest in the work, the pleasures, and the sorrows of those with whom he came in contact. He contributed to their pleasures and knew how to be of help in their sorrows. His death has left a gap in the domain of science and in the lives of hosts of friends.