

MEMORIAL RESOLUTION OF THE FACULTY OF THE
UNIVERSITY OF WISCONSIN-MADISON

ON THE DEATH OF PROFESSOR EMERITUS OLIVER E. NELSON, JR.

Oliver E. Nelson, Jr., emeritus professor of genetics and medical genetics, died on November 6, 2001. He leaves a legacy of landmark contributions to the field of plant genetics. In recognition of these contributions, he received many honors from his peers, including election to the National Academy of Sciences and the American Academy of Arts and Sciences, the Stephen Hales Prize of the American Society of Plant Biologists (awarded for noteworthy service to plant biology), and the Thomas Hunt Morgan Medal of the Genetics Society of America (awarded for lifetime contributions to genetics). Despite a lingering progressive illness that plagued the final years of his life, Oliver remained an active and productive geneticist right up to the day of his death.

Born in Seattle, Washington, on August 16, 1920, Oliver was the first son of Oliver Evans Nelson and Mary Grant Nelson. His early education was in the New Haven area, and, even before he entered college, he got some experience in genetics through summer work at the Connecticut Agricultural Experiment Station, where he worked with the renowned plant breeder, D. F. Jones. Oliver received his A.B. degree (*magna cum laude*) from Colgate University in 1941 and his M.S. and Ph.D. degrees from Yale in 1943 and 1947, respectively. His thesis adviser at Yale was the same D. F. Jones with whom he had worked while in high school. It is gratifying that, later in life, Oliver received the Donald F. Jones Medal from the Connecticut Agricultural Experiment Station for his contributions to crop improvement.

From Yale, Oliver went to Purdue University, where he was hired to run a popcorn breeding program. He did this job with typical effectiveness, and some of the popcorn lines that he developed are still in use. Oliver was aware, however, that the field of genetics in the early 1950's was turning from classical to molecular. Microbial genetics provided systems for genetic analysis that had sufficient resolution to see within the gene. The structure of DNA was revealed, and the evidence that DNA was the genetic material had become undeniable. Genetics and chemistry were coming together in the new field of molecular genetics. Oliver realized that the *waxy* mutations of corn, whose expression could be detected in individual tiny pollen grains, provided a tool for genetic analysis of a higher organism that approached the resolution possible in bacteria or viruses. His analysis of the *waxy* locus demonstrated that genes of higher organisms, like those of lower ones, could mutate at a number of different sites. He later extended the observations to show that transposable elements could produce mutations by inserting themselves at any of many different positions within the gene. These were pioneering experiments showing that the genes of plants were not indivisible particles, but rather were segments of a linear chromosome. Oliver provided the clinching biochemical support for this conclusion by showing that the product of the *waxy* gene, affected by all of the various mutations of the gene, was a starch-bound ADP-glucose glucosyl transferase. This was one of the earliest identifications of an enzyme underlying a phenotype in a higher plant.

In the early 1960's, Nelson struck pay dirt in the area of applied research relevant to human nutrition. In collaboration with Edwin T. Mertz, he demonstrated that the *opaque2* and *floury2* mutants of maize produced seed containing elevated concentrations of two essential amino acids, lysine and tryptophan, that are deficient in normal corn seed. Nutritional trials with pigs and humans showed that a diet compounded with *opaque2* maize was almost as nutritious as a diet containing milk protein. The original mutant had agronomic defects, and the development of commercially competitive "Quality Protein Maize" containing the *opaque2* mutation took a good many years. However, such corn has now become available and is becoming increasingly popular in Latin America, Asia, and Africa. The final development of "QPM" was accomplished at the International Maize and Wheat Improvement Center in Mexico (CIMMYT), and two investigators at that Center, S.K. Vasal and E. Villegas, were awarded the
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World Food Prize (Borlaug Award) in the year 2000 for their work. It is fair to say that this work of worldwide significance could not have been done without the seminal early work and continuing interest of Mertz and Nelson.

In 1969, Nelson moved from Purdue to the University of Wisconsin-Madison, where he succeeded the distinguished corn geneticist, R. A. Brink. Nelson's work in Madison covered a remarkable range of subjects including the biochemistry of starch synthesis, the genetic control of anthocyanin production, and the genetic effects of transposable elements. In the early eighties, the Nelson lab began a collaboration with Nina Fedoroff — then at the Carnegie Institution of Washington in Baltimore — that led to the cloning of the *bronze* locus of maize. This was the first successful application of transposon tagging to gene cloning in plants, and the method has since been widely used by plant molecular geneticists, including Nelson's former postdocs who used it to clone the *opaque2* gene.

Oliver served on the faculty of the University of Wisconsin for 22 years and continued his work in genetics for the 10 additional years that he held the title emeritus professor. He mentored a number of graduate students and postdocs, many of whom are now leaders in the field of plant genetics. He willingly accepted service work for the university, including a stint on the Graduate School Research Committee, and he served as chair of the Laboratory of Genetics from 1986-89. He was granted a named professorship — the Brink Professor of Genetics — in 1981. In addition to the many honors mentioned above, his students dedicated a commemorative issue of *Maydica* to him on the occasion of his 70th birthday in 1990.

Oliver's friends remember him as a slender, athletic man who was an avid golfer, skier, gardener, and swimmer. In good weather, he swam daily in the pond on his Cross Plains farm; in winter, he used the Natatorium. He loved golden retrievers and took long hikes with his dogs over the hills of his farm. Some colleagues remember him as a deft poker player. He was also an enthusiastic cook, and his students learned from him a respect for “good, but not terribly expensive, wines.” His demeanor was polished, courteous, and elegant, but he had a quick sense of humor and could produce a mischievous twinkle. His colleagues attach to him the best of qualities in a friend — integrity and magnanimity.

In his last few years, though his physical — but not his mental — activity was severely curtailed by impairments, including a very painful deterioration of the spine, Oliver persisted in his research to the last. He is survived by his wife, Gerda, whom he married in 1963. Her support in the past few difficult years helped him to persevere.

We shall remember Oliver Nelson with affection, admiration, and respect.

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