Letter to a Young Scientist

Of Scuds, a Meadowlark and Baby Mice: Recollections of a career in science

Do not accept mediocrity from anyone, especially yourself.

By Dr. Lynn E. Elfner

On September 30, 2015, Lynn Elfner retired from The Ohio Academy of Science after more than 40 years of service. During his tenure with the Academy, many people in Ohio benefited from numerous initiatives he implemented including an Environmental Science Scholarship program, expansion of State Science Day, and Believe in Ohio. For decades Lynn was the voice of the Academy and he worked tirelessly to promote science in his collaborations with state agencies, businesses, educators, and legislators in the state. His dedication to the mission of the Academy has made a lasting impact in Ohio. The Editors invited Lynn to share his thoughts about his career so that others could understand his motivation for everything that he has done for science in Ohio.

Early life experiences get under your skin in a most powerful way. That, verbatim, is the succinct statement of the findings of the National Academies of Science by contemporary author and Harvard professor Robert D. Putnam, a Port Clinton, Ohio native. It certainly fits my career in science. Experiences by the age of 5 on a farm next to the Great Miami River near De Graff, Ohio molded my interests and character.

I was fascinated by scuds—not the missiles or clouds—but the small side-swimming, translucent crustaceans in our spring. I dissected a Meadowlark that had succumbed to a hay mower and had my first social experience with a member of the opposite sex by offering a girl about my age a handful of nude, baby mice I rescued when my dad was shoveling corn to take to the elevator for grinding. The young girl's father was not impressed so that relationship ended abruptly.

Our farmhouse was on a gravel ridge, likely a glacial outwash terrace, and our front yard was in the flood plain of the Great Miami River. Here I remember my dad showing me how to drop small stones down crayfish chimneys and hear them hit the water.

I gleaned a minimal knowledge of vertebrate anatomy from a correspondence course entitled *Lessons in Taxidermy* by J. W. Elwood. Further influencing my interest in animals was Mr. Kenneth Wilburn, my Greeneview High School biology teacher who had all his students collect their own specimens for study.

My mother often read to me and took me to libraries. Two zoology-related books stand out. One described the many uses of reindeer in Lapland. Another, on falconry, was entitled *The Golden Hawks of Genghis Khan*.

With these and other biological experiences on the farm and later it should be no surprise that I was a 1967 graduate with a zoology major from the College of Agriculture at The Ohio State University.

As a youth, plants fascinated me too. In particular, I remember encounters with stinging nettles near the river. I remember the heady aroma of the fermented corn silage we fed our Jersey cows. We always gathered walnuts, hickory nuts, red haws, mushrooms, hickory jacks, black raspberries and elderberries. I have vivid memories of playing "jungle" under the canopy of a large stand of Pawpaw trees on the back 40.

Biology was not my only interest. On the farm, I came in close contact with the soil and with the va-

riety of stones in our gravel pit. I loved to find pieces of Pyrite or Fool's gold and limonite, a rusty-brown, soft chalk-like stone that I marked easily on our back stoop. Mr. Wilburn was influential, again, later in my career. In addition to biology, chemistry and physics, he taught one of the first high school earth science classes in Ohio that I thoroughly enjoyed.

Mechanical devices were available to me too on the farm. A hydraulic ram pumped water from the spring, the pulsator on the milking machine needed constant care and the hay hook attached by rope to pulleys to increase the mechanical advantage lifted the loose hay from a wagon into the haymow.

Several additional factors affected my career choice in science, but one stands out: 4-H.

I joined the Greeneview 4-H Conservation Club in the 6th grade and participated throughout high school. Our advisor, the late Fred E. Morr, then Greene County Auditor, later became Director of the Ohio Department of Natural Resources under Governor James A. Rhodes. More than any other organization, 4-H helped to develop personal and group interrelation skills, meeting management skills, and communication skills as well as content knowledge. I took a variety of projects including all of the soil and land use related ones. My indebtedness to 4-H is symbolized by a "Greene" 4-H vanity license plate named for Greene County.

Vocational agriculture and specifically FFA had a very positive effect on my career. Under the influence of our farmer-teacher, the late Carl Pickering, I was a member of a freshman team that received first place in a multi-county FFA land judging contest near Xenia. Not only did this event require specific knowledge of soils, but also as importantly, we needed to match our wits, as a team, against professional soil scientists.

The Ohio Academy of Science influenced me in high school when I earned the honor of exhibiting my fossil project at the District Science Day at Central State University. I did not make it to State Science Day. The lesson learned here was that although I could classify the fossils that I collected at the spillway of Cowan Lake near Wilmington, that project was not science. There was no question, no hypothesis, no method or data and certainly no conclusion. Now I get what science is.

Libraries and books profoundly affected my career. These stand out: The first edition of *Ohio Fossils* by Aurele La Rocque and Mildred Fisher Marple; *Ohio Trees* by F. E. Dean and L.C. Chadwick; *Field Book of Ponds and Streams* by Ann Haven Morgan; and *The Fishes of Ohio* by Milton B. Troutman.

On the physical science side, one book especially has a lock on my memory: The Boy Builder published in 1933 by Edwin T. Hamilton. This book and subsequent kits for sale in Popular Mechanic's magazine were forerunners of "Bob the Builder" series for children today.

My knowledge and experience in applied physical science expanded sharply when we sold the farm in 1950 and moved from De Graff to the Jamestown for my dad to become part's manager for an International Harvester farm store. For many years I encountered numerous mechanical devices. I remember specific items like pitman rods, Woodruff keys and "V" belts. Often my dad would bring home discarded parts for me to disassemble. Little did I know then that disassembly is the first step in reverse engineering. My biggest surprise was an electrical shock from a magneto off an old Farmall tractor. On my 12th birthday, my father gave me a Taylor Weather Station kit that required a great deal more than "some assembly required." There were no batteries; just the basics that included a sling psychrometer and a nomograph to calculate relative humidity, a barometer, a wind speed and direction indicator, a rain gauge and others. Most importantly, however, the kit contained a notebook that instilled the habit of collecting data. That habit served me well in my own research.

Two years of Latin under the late Ms. Lilian Paulin at Greeneview High School not only helped with scientific nomenclature but also with English writing.

My first professional appointment was as a conservation teacher at 4-H Camp Palmer in Fulton County where I worked every summer during college from 1963-1967, touching the lives of about 5,000 students. Those experiences were parlayed into a 3 year stint as a middle school science teacher at Mount Orab where my star student went on to receive a PhD in geology and chaired the board of Ohio Nature Conservancy, attributing his interest in nature to middle school field trips we took to Adams County prairies and streams.

Following teaching, I received a Master's degree in botany (1971) from The Ohio State University under Dr. Ronald L. Stuckey where my thesis depended on knowledge of climatology, plants, soils and glacial and Pleistocene geology. A graduate level course in the latter subjects by the late Dr. Richard P. Goldthwait, founder of the Byrd Polar Research Center at Ohio State, greatly aided my research.

As Executive Director of The Ohio Environmen-

tal Council, I helped to prevent the construction of un-needed dams and channelization of streams, and helped to save Cedar Bog. The most lasting contribution was in 1972 to establish Rivers Unlimited, now the Nation's oldest river preservation group.

During my term as a budget analyst in the Ohio Office of Budget and Management, I oversaw the budgets of the Ohio EPA, Ohio Department of Natural Resources, Ohio Power Siting Commission, Ohio Water Development Authority and Ohio Air Quality Development Authority. The most important accomplishment in that position was approving a contract for an advocate who rallied support to create The Cuyahoga Valley National Recreation Area. In 2011, I was pleased to receive an honorary Doctor of Science degree from Ohio Northern University. Thank you, Prof. Terry Keiser. First employed by The Ohio Academy of Science on February 27, 1975, I have spent over 40 years advancing science and science education through the Academy.

Lessons Learned

Immerse yourself as young as possible in science that interests you. Research shows it will get under your skin. Be curious, skeptical and work to discover something new. Apply science daily, especially to understand the weather. Be persistent. Join organizations like 4-H, FFA and The Ohio Academy of Science that connect you with science professionals. Learn to write well. Take a lot more mathematics than I did. Finally, and most importantly, do not accept mediocrity from anyone, especially yourself.

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