

Biographical Sketch of Dr. Elio D'Appolonia

Dr. Elio D'Appolonia, known to his friends and colleagues as D'App, was born on April 8, 1918 in Coleman, Alberta, Canada. In his teens, D'App decided to quit school and work for his father who was a successful contractor in the Crow's nest area. His father, appreciating D'App's potential, gave D'App some of the most physically demanding tasks. D'App quickly gained an appreciation for education and returned to high school and graduated with honors.

In 1942 D'App graduated from the University of Alberta with a bachelor's of science degree in civil engineering. Also in 1942 D'App married his wife Violet, known to her friends as Tina. From 1942 to 1946 D'App pursued a master's degree from the University of Alberta and was a lecturer in civil engineering at the University. During this time he also worked for the United States Army Corps of Engineers performing research for the construction of airports, highways and power plants on permafrost. D'App wandered over much of northwest Canada and Alaska while performing the research. In 1946, he and his mentor, Professor R.M. Hardy, published a paper on their research. In 1948 they received the Keefer Medal from the Engineering Institute of Canada for the best paper in Civil Engineering.

From 1946 to 1948 he pursued a PhD in structural engineering at the University of Illinois under Dr. Nathan Newmark. Dr. Newmark was doing innovative work in numerical methods at that time that attracted D'App's interest. A research program of the failure of Liberty Ships, with loss of the vessel, in cold water was being performed at the University at the time. The problem related to embrittlement, hardening of steel with loss of ductility. D'App's research focused on an assessment of stress buildup at various size and shapes of openings, notches, and welds. D'App improved upon the lattice analogy numerical method, which was to evolve into the finite element method, to perform the calculations to support his research. Some of D'App's research also had application in triaxial testing of soils, specifically how to address the impact of end restraints of test specimens.

After completing his PhD, D'App accepted a position at Carnegie Institute of Technology, now known as Carnegie Mellon University. Initially, he taught structures and performed research on the behavior of titanium. A need quickly arose for someone to teach the soil mechanics course and D'App volunteered and built the soil mechanics program at Carnegie Tech into one of the top programs in the Country.

In the early 1950's D'App, in addition to his academic responsibilities, began providing consulting services on several projects. The demand for his consulting service increased with each passing year and in 1956 he formed D'Appolonia Associates and began working full time as a consultant. In 1965 the company reorganized as E. D'Appolonia Consulting Engineers (EDCE). EDCE grew to over 500 employees with offices across the country and in Europe.

As a consultant D'App was known as being a superb mentor and for undertaking challenging projects that other companies indicated could not be done the way D'App proposed. Yet D'App succeeded saving clients millions of dollars. Two examples of such projects are the Bethlehem Steel plant (now Arcelor-Mittal) in Burns Harbor, Indiana, and the Olympic Velodrome in Montreal, Canada.

In the early 1960's Bethlehem Steel began building a fully integrated steel mill in Burns Harbor, Indiana at the south tip of Lake Michigan. The design engineer proposed to found the steel mill on piles. D'App convinced Bethlehem that the steel mill, with the exception of a few heavy structures, could be supported on shallow spread footings. Ironically, at this time D'App wrote several award winning papers on piles and load transfer of different types of piles. Bethlehem retained EDCE as the principal geotechnical engineer on the project saving the client millions of dollars.

The Velodrome for the 1976 Montreal Olympics was designed as a tensioned dome anchored at three massive concrete abutments. The dome was to be supported by temporary scaffolding during construction. Once the dome was completed the dome would be jacked into place by tensioning rock anchors installed through the concrete abutments. The jacking program required by the dome design engineer would have resulted in the Velodrome being completed after the Olympics. D'App and his staff performed a field investigation and developed a finite element model of the bedrock beneath the Velodrome. D'App proposed an alternate arrangement of rock anchors and a much more rapid stressing of the anchors resulting in finishing the Velodrome a month before the Olympics began.

D'App was also very active in his professional life. He was a founding member of Terra Insurance, a group of geotechnical firms organized to self-insure the participants work. He was also, among other positions, Chairman of the Executive Committee of ASCE's Soil Mechanics and Foundations Division (SMFD). In 1988 the SMFD recognized D'App's contributions to the

profession with their prestigious Terzaghi Lectureship. The title of the Terzaghi Lecture was “Monitored Decisions”. It was through the “Monitored Decisions” approach that D’App was able to propose innovative solutions to numerous engineering problems.

D’App’s accomplishments were recognized by numerous organizations and institutions.

A list of these include:

1948-Keefer Medal, Engineering Institute of Canada, for the paper, "Permanently Frozen Ground and Foundation Design"

1969-Thomas A. Middlebrooks Award, ASCE, for the paper, "Settlement of Spread Footings on Sand"

1972-Civil Engineer of the Year, Pittsburgh Section, ASCE

1977-Elected to the National Academy of Engineering

1981-William H. Metcalf Award for Outstanding Engineering Achievement, Engineer's Society of Western Pennsylvania

1981-Distinguished Alumnus Award, University of Illinois

1983-Honorary Degree of Doctor of Engineering, Carnegie-Mellon University, Pittsburgh, Pennsylvania

1983-Distinguished Service Award, Deep Foundations Institute

1986-Honorary Member, American Society of Civil Engineers

1988-Alumni Honor Award for Distinguished Service in Engineering, College of Engineering, University of Illinois, Urbana, Illinois

1988-Honorary Degree from the University of Genoa, Genoa, Italy

1990-John O. Bickel Award, American Society of Civil Engineers, for the paper, "Temporary Support Using Jet-Grouted Cylinders"

SPECIAL LECTURES

1970-Canadian Lecture Tour, National Research, Ottawa, Canada

1978-Dutron Lecture, ABEM, Brussels, Belgium

1979-Martin S. Kapp Memorial Lecture, New York, New York

1981-Third Annual Kersten Lecture, St. Paul, Minnesota

1983-ASFE Memorial Lecture, New Orleans, Louisiana

1986-Second Hageman Lecture, Nashville, Tennessee

1988-Twenty-fourth Terzaghi Lecture, St. Louis, Missouri

1992-Geotechnical Engineering Distinguished Lecture, Colorado State University, Fort Collins, Colorado.