

## **Memorial to Donald L. Lamar 1930-2009**

### **Paul M. Merifield**

*"And some run up hill and down dale, knapping the chucky stones to pieces wi' hammers like so many road makers gone daft. They say 'tis to see how the world was made."* - Sir Walter Scott. This quotation, which hung on the wall of Don's office, symbolizes his passion for field geology. His expertise in southern California geology was well known, but his exceptional talents went far beyond that.

Donald L. Lamar was born in Glendale, California, on May 6, 1930. He contracted polio when he was six and limped until he was about eleven. Don worked for his father in the construction business as a teenager, gaining knowledge in house construction that later proved valuable to him as a consulting engineering geologist. He attended Glendale High School, where he was a top student. Recognizing his potential, his teachers encouraged him to apply to Caltech, where he played on the football team and graduated in 1952 with a bachelor's degree in geophysics.

Shortly after entering graduate school at the University of Kansas, Don was drafted into the U.S. Army, where he spent two years as an instructor in map reading at the Presidio in San Francisco. Upon discharge he attended UCLA, receiving a master's degree in 1959 and a doctorate in 1961. His master's thesis dealt with the geology of the Corona, California, area and focused on the Whittier fault, while his dissertation concerned the structural evolution of the northern margin of the Los Angeles basin. Both were primarily field mapping projects, and his dissertation - which was published as a California Division of Mines and Geology Special Report - is a standard reference for the area covered. During graduate work, Don spent summers working for oil companies and conducted field work in Alaska, Wyoming, New Mexico and California.

While completing his dissertation, Don applied for employment with the RAND Corporation, initially to work with noted engineering geologist William R. Judd on the basing of aircraft and missiles in hardened underground structures. During this project, he conducted gravity surveys in the southwestern United States to detect underground caverns. After Judd left RAND, Don applied his solid science and mathematics background to a variety of projects, including the anomalous sounds and electromagnetic effects associated with fireball entry, and the appearance of nuclear explosions in remote-sensor imagery. It is remarkable that someone whose interest was primarily in field geology could also publish papers in leading scientific journals on the optical ellipticity and internal structure of Mars, the stability of the Earth's axis of rotation and phase changes, and the shape and internal structure of the Moon from Lunar Orbiter data – the latter study in collaboration with his future wife, Jeannine McGann.

Yearning to get back into field geology, Don left RAND after four years and entered private consulting, primarily as a principal of Santa Monica-based Lamar-Merifield, Geologists, Inc., practicing engineering geology as well as engaging in applied geoscience research under contracts and grants with the U.S. Geological Survey, NASA, the U.S. Navy, the U.S. Department of Energy, and the National Science Foundation. Government-funded studies involved the geology of central San Clemente Island, with emphasis on faulting and its relevance to the construction of a proposed sub-sea facility; paleoseismic studies of the Elsinore and San Jacinto fault zones; origin of photo lineaments in the basement terrane of the Peninsular Ranges of southern California; application of private site-specific fault-trenching data to the regional evaluation of earthquake hazards in southern California; earthquake-deformed Holocene lake sediments in Kern Lake, California; microseismicity and recent tectonic activity on the Whittier fault; and monitoring of ground-water levels and

geochemistry in wells in an attempt to identify precursors to earthquakes along the San Andreas and San Jacinto faults as part of the Geological Survey's National Earthquake Hazard Reduction Program.

In connection with the last project and with the aid of an electrical engineering graduate student at UCLA, Don developed a system for telemetering water level, water temperature, and barometric pressure readings with the intent of providing high-volume, real-time data. However, this project, by far the largest for our small firm, terminated after nine years when we reported that the water-well data were not sufficiently consistent to demonstrate their usefulness in predicting earthquakes, and the cost and unreliability of the telemetry system outweighed the advantage of real-time data. On his own time, Don continued theoretical studies concerning the effect of lunar and solar tides on the rotation of the Earth and the recession of the Moon from the Earth, and was invited to present his ideas at a conference on paleogeophysics in England.

Following discussions with the National Science Foundation's Arctic Research Division, Don conceived and conducted a multiyear study of the Billefjorden fault zone in Spitsbergen with Walter E. Reed of UCLA and David N. Douglass, currently Dean of Natural Sciences at Pasadena City College. Relying entirely on helicopters for provisions and transport, the team of investigators conducted detailed mapping along the fault during three field seasons. Dave Douglass recalls that "Don loved mapping, and was driven to cover as much ground as possible every day. This drive, coupled with 24 hours of daylight, often led to some very long field days because we didn't have to worry about getting back to camp before dark. If we complained, Don simply advised us to pack more lunches." Fearful of polar bears, Don deliberated at length over the proper rifle to purchase for protection. Fortunately, no polar bears were encountered, but it was

later learned that one poor fellow had been eaten because his gun – the same model Don had selected – jammed. The results of the study, based on the interpretation of structural features within the fault zone, showed the fault movement to be primarily reverse, as opposed to earlier suggestions of a major strike-slip component.

For many years Don provided consulting engineering geology services related to hillside residential construction and evaluated existing homes for potential buyers. His thorough reports noted every observable crack in structures, and he routinely crawled through the underfloor areas of homes – a unique practice for geologists at the time - insisting that examination for cracks in the concrete elements of foundations is critical to assess the stability of underlying earth materials. From 1979 to 1988, Don served as the principal engineering geologist for the City of Palmdale, California, reviewing geological reports submitted for building permits. He was unpopular with some developers because of his uncompromising evaluations and eventually was replaced with a more accommodating reviewer.

Don is remembered by many former students as a popular instructor at the University of Southern California, where he taught field geology and geology for engineers for many years as an Adjunct Professor. He also taught Physical Geology at California State University, Los Angeles, and was employed as an Instructor during graduate study at UCLA. He was a fellow of the Geological Society of America and a member of the Association of Environmental and Engineering Geologists, serving a term as Chairman as well as being a field trip leader of the local section. Additional memberships included the American Association of Petroleum Geologists, the American Geophysical Union, and the Meteoritical Society.

Among Don's interesting traits were his sense of humor and sometimes eccentric behavior. Don's favorite sayings were "nobody said life was fair" and "nothing is going to turn out all right." He also boasted that he could survive hard times in the consulting business because as a graduate student he learned to "live close to the ground." He was a great admirer of Linus Pauling, whose introductory chemistry class he had taken at Caltech. Following Pauling's advice he took large doses of Vitamin C and strongly advised others to do the same. He was a creative cook, well-known for his tacos, and for years was on the Atkins diet, believing that the high cholesterol component of the diet could be "dissolved" by an ample intake of red wine. Don was a workaholic and perfectionist, but could exasperate colleagues and staff by putting things off until the last minute. The final days before research proposals were due could be hectic, with Don working long into the night and - in one instance - completing a proposal in the early morning hours and having it hand-carried by a weary secretary via air shuttle to the Geological Survey offices in Menlo Park.

Ideas gushed from Don's fertile mind; some were gems, but others were bizarre and had to be screened out by his collaborators, including his good friend and colleague Mason L. Hill. Don had a number of ideas for inventions and spent considerable time searching patents although none came to fruition. However, when the Travis apparent-dip protractor - which he thought so useful - became unavailable, he considered it his destiny to resurrect it. With the cooperation of Russell B. Travis, he redesigned and manufactured a new model that he dubbed Zip-A-Dip, a name suggested by one of his field geology students at USC. This endeavor did not bring riches, but it satisfied his desire to invent, and the practical devices have been purchased for over 20 years by students and professionals. To many students who did not have the privilege of taking one his classes, Don was known as "Mr. Zip-A-Dip."

In 1990, Don retired when he realized he could no longer work due to the symptoms of bi-polar disorder, and moved to Oregon and later to Reno, Nevada. Between long periods of depression, Don and Jeannine traveled to Australia, South America, Antarctica, and Easter Island, and he prospected for minerals and petroleum in the western United States, developing oil plays in California, one of which remains a viable prospect. His health deteriorated significantly beginning in 2007, and he passed away quietly of heart failure on June 1, 2009, at the age of 79. I will remember Don as having a superbly logical mind with the unique ability to dissect a complex problem into more manageable components. He was also a very generous, amiable individual and a loyal and trusted friend. His wife Jeannine describes Don as a brilliant, kind, and considerate man.

### Acknowledgments

The author is indebted to Richard J. Proctor and Roy J. Shlemon for review of this memorial.

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Don and Jeannine Lamar in Antarctica



**Don with Dave Douglass in Spitsbergen**