

Dwight E. Deal

NSS #3592 RL, FE, CM
April 18, 1938 – June 11, 2022



Dwight Deal on the lower canyons of the Rio Grande, 1979, by Sandy Deal

Dr. Dwight E. Deal, 84, passed away on June 11, 2022, in Parker, Colorado. This is a blow to the caving community as Dwight was a famous caver and geologist, well-liked, influential, and accomplished in many ways. He was a scientist and educator with expertise in earth and environmental sciences. He was a life member of the National Speleological Society, an NSS Director, a Fellow, and a recipient of the Certificate of Merit. He was an NSS Luminary speaker in 2012. He and his wife, Mary Fletcher Deal, were popular leaders of educational karst tours in China, Laos, Vietnam, the Balkans, and Cuba. He is survived by his wife, Mary, son Craig of Albuquerque, New Mexico (wife Pam and son Jonathan), and daughter Tara Deal Vargish (husband Jacob and children Andrew, Joshua, and Caroline) of Castle Rock, Colorado.

Mary said that they were living as normally as possible, and had just returned from a couple of months at their cabin in Terlingua, Texas. Dwight was recovering from a debilitating bout of pneumonia that severely stressed his body systems, and he was doing physical therapy to help regain his strength. He had his favorite roast beef sandwich and part of a glass of tea Friday evening. Watching his TV programs, he fell asleep in his favorite chair, and peacefully passed away overnight.

Dwight was first and foremost a husband and father. He also was a geologist, geomorphologist, hydrologist, speleologist, environmentalist, conservationist, master caver, river rafter, canoeist, rock climber, mountaineer, pilot, educator, mechanic, skier, geoscience tour guide, and wilderness medicine expert. He could be warm and caring, often sharing his knowledge and experience and offering his advice. At times he also exhibited New York City brusqueness, and had no patience with fools and pretenders. He was intensely curious about the world around him and driven to understand nature and preserve special places. Although he often said that he had no interest in politics, he was an adept negotiator who was equally comfortable advising young students and interacting with people in positions of authority. When necessary, he accepted political assignments, and did what was required to be successful. He was a member of several professional organizations including the American Institute of Professional Geologists and the American Association for the Advancement of Science, where he sat on the Committee on Geology and Geography. He was an organizer, innovator and problem solver, and he excelled at overcoming obstacles and getting things done. He was the epitome of a renaissance man.

Dwight Edward Deal was born April 18, 1938, on Staten Island, New York, the only child of Ralph and Genevieve (Hall) Deal. His father was a professor and chairman of the Biology Department at Wagner College, and his mother was a librarian. Dwight grew up in an environment that encouraged and fostered curiosity, valued education, and loved the outdoors. During his early years the family went on numerous summer camping trips to the Adirondack Mountains of upstate New York, and as Dwight reached his teen years, those trips extended to National Parks and visits to show caves across the country. Dwight graduated from Port Richmond High School on Staten Island in 1955, and the following September enrolled at Rensselaer Polytechnic Institute (RPI) in Troy, New York. Initially his major was electrical

engineering, but he changed to physics while taking all of the geology classes RPI offered. He graduated in 1959 with a Bachelor of Science degree in geology (geophysics emphasis).

Soon after arriving in Troy, Dwight joined the Rensselaer Outing Club and participated in rock climbing, whitewater canoeing, skiing, ice skating and square dancing. His climbing skills were honed in the Shawangunk Mountains of New York. He also ran on the cross country team and played hockey. His first wild cave trip occurred on a cold day in January 1956, when he visited Bentley's Cavern with the Outing Club. He soon visited other caves, including Knox and Balls and rappelled into the back entrance of Clarksville Cave. During one of those trips, Dwight met Russ Gurnee, who was so impressed that he gave him a signed membership application form for the National Speleological Society (NSS). In those days, an applicant needed a sponsor to join.



Dwight in Organ Cave, West Virginia, 1958

During the summer of 1956, Dwight's family traveled west, visiting Luray Caverns in Virginia and Mammoth Cave in Kentucky. They arrived at Floyd Collins Crystal Cave late in the afternoon after the tours had ended, but Dwight spoke to Bill Austin about the National Speleological Society's C-3 Expedition that took place in 1954. Austin asked Dwight about his interest in cave exploration and then took him on a special after-dinner tour of Crystal Cave, passing through the room containing Floyd Collins' coffin and into the helictite area. A result was that exploration in Mammoth Cave and Flint Ridge became an important part of Dwight's caving career.

By 1956 Dwight had become an active caver in New York, reactivating the Rensselaer Student Grotto, part of the Outing Club. Revitalizing grottos and establishing new ones would become a pattern for him. In 1957, he was certified as an American Red Cross First Aid Instructor and began teaching classes oriented toward Outing Club members. He continued caving in New York and West Virginia and attended the Spring Intercollegiate Outing Club Association (IOCA) conference. IOCA decided to set up a leadership program in spelunking, and appointed Dwight and Dick Byrom as co-chairs.



Dwight on Exum Ridge, Grand Teton, 1959

Dwight graduated from RPI in 1959 and went west to Wyoming, where he climbed in the Tetons and some of the desert towers, including Ship Rock in New Mexico. Along the way, he climbed Devil's Tower and in the Needles of the Black Hills, where he met Herb and Jan Conn. In September 1959, Dwight was hired by Pan American Petroleum and worked on geophysical crews in eastern Wyoming while living near the Black Hills in Moorcroft and Gillette. He heard that the Colorado Grotto would be mapping in Wind Cave over Labor Day weekend and joined them. As a special reward for their work, Dick Hart, Chief Naturalist at Wind, took them to Jewel Cave to explore beyond Milk River. The group got as far as the Discovery Rooms at the end of the Badger Hole Traverse, where Dwight immediately recognized the significance of the strong wind blowing across Milk River. The next week he drove to Wind Cave and approached Dick Hart about the possibility

of exploring and mapping in Jewel Cave. Hart agreed, and Dwight then recruited Herb and Jan Conn to help him under a Special Use Permit with the Park Service. They spent almost every weekend for the next three months exploring and mapping in Jewel. Dwight was among the first true cavers to examine the geology of the Black Hills caves, building on earlier work, especially that of NSS members Will White and George Deike, and winning an NSS grant to help support his study.

He was accepted into the graduate program at the University of Wyoming for the fall 1960 semester. He adapted and expanded the work he was doing in Jewel Cave to fit the requirements for a thesis and earned his Master of Science degree in 1962. He mapped the geology in and around Jewel Cave National Monument, including an east-west-trending zone of normal faults with their northern flanks offset upward by about 600 feet. Dwight concluded that most Black Hills caves formed under alternating phreatic and vadose conditions, with residual brown calcite veins protruding from the walls to form boxwork. He concluded that the Black Hills caves have a complex origin that may have begun in the Oligocene Epoch about 30 million years ago. His thesis discussion of cave origin was tentative and cautious, but showed strong insight in his understanding of caves and their origin, much of which is still considered valid. He, the Conns, and local helpers surveyed about 6.5 miles of passages in Jewel Cave, adding to approximately 2100 ft. of earlier NPS transit surveys. He examined rock samples in the lab, and explored the limits of existing hypotheses, but avoided projecting beyond what the field data showed.

Dwight was admitted to the University of New Mexico (UNM) graduate program as a PhD candidate in May 1962, and moved to Albuquerque the following September. During the ensuing years, he helped revitalize the Sandia Student Grotto at UNM. Shortly after arriving in Albuquerque, Dwight met Sandy Renstrom during a house-warming party at his cabin in the Sandia Mountains. Sandy was a skier, dancer and musician, and they were immediately attracted to each other. Sandy became a caver and was well known as a singer, guitarist and violinist. Dwight and Sandy were active New Mexico cavers, visiting caves around the state, but especially in the Guadalupe Mountains. They were married on May 29, 1965.

Dwight continued his graduate studies, and for a dissertation topic chose to map post-volcanic stratigraphy in the Gila area of New Mexico. The project required moving to southwestern New Mexico, where Dwight set up residence in the tiny and remote mining town of Pinos Altos. During breaks from field work, he taught rock climbing for cavers and visited many caves, including Fort Stanton Cave and Torgac Cave, which is known for its bizarre gypsum speleothems. He also led groups of Albuquerque cavers on trips to southern Arizona. While living in New Mexico, Dwight traveled throughout the west, visiting caves in California, Nevada, Utah, Arizona and Colorado. He went to the bottom of Neff's Canyon Cave when it was the deepest known cave in North America.

Dwight was an innovator of climbing and caving techniques and equipment. He learned about the "Iowa Cam," which was created by Iowa cavers Robert Henshaw and David Morehouse, who were attaching them to their feet to climb rope. Dwight redesigned the cam and built the new version in his parent's house at Wagner College, calling it "The Infernal Machine." Charlie Gibbs further refined the design in the 1970s and changed the rigging so that one ascender was near one foot and another at the opposite knee. This was a very efficient rope-climbing technique, and led to the rapid adoption of the Gibbs Ropewalking System by American cavers.

The 1966 NSS Convention was held in Sequoia National Park, California. At that time, there was concern among some NSS members that the NSS leaders were out of touch with mainstream cavers. To combat this, Bill Stephenson, founder of the NSS, asked Dwight to help him set up a Fellows program. Bill's idea was that up to 10% of the Society should be honored as Fellows, but he was not sure how to get the program started. They decided to begin with a core made up of Honorary Members and Certificate of Merit winners, but Bill wanted to make sure that the first-year nominations acknowledged as many deserving cavers as possible. Bill knew the quiet cavers who supported the administrative side of the NSS. Dwight knew the active members, and his task was to nominate exceptional candidates, many of whom were not known by the Board.

Dwight was an influential figure in the caving community and the NSS, but he never wanted to be an executive, preferring to lead from within the ranks. Bill Stephenson contacted Dwight and convinced him to run for the NSS Board, arguing that the Directors of the NSS were getting old and out of touch with the active cavers, especially those who lived in the west. Dwight ran on a platform that promised to make the concerns of all active cavers clear to the Board of Directors. Dwight promised: "If elected, I will come sleep on your floor." He was, and he did.

In May 1966 Dwight left UNM to search for a job, eventually taking a teaching position at Sul Ross State University in Alpine Texas. In 1969, Sul Ross gave Dwight a Faculty Development leave with full pay for a year to finish his PhD. He went to Grand Forks, North Dakota, and started field work in Rolette County as a geologist for the North Dakota Geological Survey, where Sandy worked as a draftsman. Dwight's dissertation was accepted by The University of North Dakota, and he received his PhD in August 1970.

During his years in Alpine (1966-1983), Dwight focused on his career and the need to support his family. He was never comfortable with corporate and academic politics, preferring to work as an independent contractor whenever possible. On the occasions where he did work in the academic world, he and Sandy adapted, but were never comfortable in structured and political work environments.

Dwight's first child Craig was born January 7, 1972, and daughter Tara followed on May 31, 1974. Both children were introduced to the outdoor world at an early age and were involved in caving, river rafting and other activities. Although he was not as active with NSS caving projects as in the past, Dwight still found time to participate with the Carta Valley Society of Underground Cavers and Karstologists, a group of free-spirited cavers who eschewed the typical political structure of the NSS. Although the group was refused Grotto status by the NSS, it was an important part of the Texas caving scene.

Many of Dwight's work projects had a strong connection with caves, karst, and the environment. He stayed in contact with the NSS by attending as many annual conventions as possible. Dwight became a river runner, making dozens of canoe and raft trips on the Rio Grande through Santa Elena Canyon, part of the border between Texas and Mexico. During this time, he conducted a cave and karst evaluation of the limestone beds that border the Rio Grande, but found very few caves. He concluded that the hydrologic conditions had not been suitable for the development of caves and other karst features.

During his years in Alpine, Dwight was a founding Director and General Manager of the Chihuahuan Desert Research Institute, an interdisciplinary organization. He contributed as a member of the Board of Directors, and was treasurer from 1973-1978. He organized and managed educational field programs in the Chihuahuan Desert region of Mexico, trans-Pecos Texas, New Mexico, and Arizona, and developed an outdoor education teacher-training program for the Texas Educational Association

From 1968-1984, Dwight owned and operated Geofactors, a geological consulting business focused on west Texas. He provided geological services, including hydrology, groundwater geology, general mineral exploration, environmental geology, waste-disposal site evaluation, and land-use planning. At various times he supplemented his consulting work with short term assignments with various agencies in Texas and elsewhere. He re-established Geofactors in 1995 after moving to Albuquerque, New Mexico.

In 1972-1973, Dwight worked at the Texas Bureau of Economic Geology (BEG) where he was responsible for environmentally oriented groundwater studies. Part of his assignment involved mapping of the Edwards Aquifer recharge zone, which is dominantly a carbonate karst terrain.

From 1973-1978, Dwight coordinated field and office work of the Texas Natural Areas Survey, managing a staff of specialists in geology, archaeology, botany, zoology, wildlife, range management, soils, forestry, and speleology. This group prepared reports on important natural areas within Texas under contract with the Texas General Land Office and the Texas Parks and Wildlife Department. Many of the sites he investigated, including the Devil's Sinkhole and other karst features, are now protected by acquisition or expansion of existing Texas state parks.

In 1982 Dwight accepted an assignment as consulting hydrologist with Tetra Tech International, Muscat, Sultanate of Oman. The job of finding water in the desert of Oman required that he not only identify places to drill but also act as project engineer, expeditor, and field manager.

In October 1983, Dwight's wife Sandy died. This event caused a serious shift in his life since he now was a single parent with two young children. Dwight took a job with IT Corporation in Albuquerque, New Mexico, and worked for the next 11 years on projects at the Waste Isolation Pilot Plant near Carlsbad, New Mexico.



Dwight married Mary Fletcher (August 31, 1996), and this opened new worlds for him far beyond caving. It worked the other way around for Mary. The world of cavers, cave explorers, and cave scientists was one she would never have known about. Mary was involved with the Denver Sister Cities program, especially with Kunming, China, with the Asian Art Association (AAA) support group for the Denver Art Museum (DAM), and with the Denver Chamber Orchestra. She was also the Executive Director of the Performing Arts Medicine Association (PAMA), a small international group of doctors, physical therapists, and performers dedicated to extending the performing life of talented musicians, dancers, and artists. For 17 years Dwight assisted members and did the technical production of their annual symposium in Aspen.

Dwight and Mary merged their areas of expertise in many ways, but one that appealed to cavers was the establishment of a business called Focused Tours, which put together special trips to remote and sometimes hard-to-visit parts of the world. Their trips blended cave and karst science with cultural and local history, providing a unique opportunity for participants to experience classic karst regions of China, Viet Nam, Slovenia, Croatia, and Cuba, as well as retracing the Silk Road in northwest China.

Dwight and Mary on the Yangtze River, China, 2010, by Barbara Schaefer

A man and his karst: Dwight in the Vinales Region of Cuba, December 2014, by Dale Pate

When they were not traveling, Dwight and Mary split time between their home in Colorado and their cabin in Terlingua. Dwight never lost his love for the Big Bend country and spent as much time in West Texas as possible. Dwight enjoyed sitting on the deck in the afternoon, having an iced tea, and sharing stories with Mary, his family, and reminiscing with old friends.



The Deals and Palmers had planned to share a quiet afternoon with Jan Conn during the June 2022 NSS convention, recalling past experiences. Sadly, a few days before the convention, Mary reported that Dwight had died unexpectedly, but peacefully in his sleep.

Family and close local friends had a Celebration of Life for Dwight on July 17. Additional celebrations will be held with local covers and one in Terlingua this fall. For more information on these events, send a request to Mary Deal at chinamf@comcast.net.

Additional information and photos about Dwight Deal and Sandy Deal may be found at <https://cavelife.info/hall/hall.htm>



2021, Mary and Dwight at Terlingua in their Manx, built by Dwight in 1969.

Writers: Mary Fletcher Deal, Harvey DuChene, William R. Elliott, Art and Peggy Palmer, and Geary Schindel

8/6/2022

Addenda:

Excerpt from a letter by Dwight Deal to Bill Elliott, March 2020

I feel I have contributed “educationally” to many folks on an individual basis and to the larger society in several ways.

The most significant, and surprising, was the Texas Natural Areas Survey (TNAS). Don Kennard was the politician who knew absolutely nothing about how to run a field science program. I did, but knew absolutely nothing about Texas politics. We made a good pair. When we were doing it, I thought we were expending a lot of effort just pissing in the wind. It was enormously gratifying to come back 20 years later to West Texas and discover that most of the 27 areas we studied were now in the public domain in some way: state parks, wildlife sanctuaries, added onto national parks, small city parks that became large state parks, newly-designated "natural areas", or owned by the Nature Conservancy or similar land conservation group. There was also a greatly increased awareness in the Texas legislature about the value of natural areas, caves and bats.

The other real contribution to science and society was my study of the brine seepage into the underground excavations at the WIPP, described in the attached file: “WIPP Brine Program”. This involved the very unusual conditions of fluid flow through a deforming, soluble, plastic material - salt. The results of that study finally allowed the repository to open. The presence of very small amounts of moisture over geologic time presented a theoretical, but potentially show-stopping, problem. It was presumed that moisture could react with the steel drums that the waste was stored in (and metal included in the waste), generate hydrogen gas, and overpressure the repository in some far in the future date, potentially causing leakage. After 11 years and a very high-powered staff that I recruited, we were finally able to show that the brine seepage into the excavations was local and mostly stopped after about three years. What brine did come into the excavations during the years that the underground excavations were open to the atmosphere was evaporated and removed by the air circulated during construction and waste emplacement. There is no appreciable long-term supply of moisture to cause a gas generation concern and the WIPP could begin receiving and disposing waste. The fact that I had anything to do with this is buried in National Academy of Science meeting minutes, internal DOE memos, and obscure specialized meetings on the management of nuclear waste. Final DOE documents that I authored were issued without any author citations. That was just the way it was going to be. It is the results that were/are important to me. But it is almost impossible in any ordinary citation search to discover my critical involvement.

Overall my life has been very interesting, enjoyable, and full of fun. Although, as you know, there were also some truly awful times. With a background in both engineering and science, I find I have walked with one foot in each discipline almost all of my technical and practical life.

See additional photos in **Deal_Album.pdf**, his publications in **Deal_Pubs.pdf**, and a poem by Jan Conn in **Deal_Poem.pdf**.