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# EUGENE EDWARD FOORD, 1946–1998

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The death of Eugene Foord on January 8, 1998, at the age of 51, was a loss to the world's mineralogical community.

Gene was born in Berkeley, California, November 20, 1946, to Beth and Del Foord. Gene overcame a severe congenital hearing impairment to graduate from Garden City High School, New York in 1964, followed by degrees from Franklin and Marshall College (A.B., geology, 1968), Rensselaer Polytechnic Institute (M.S., geology – petrology, 1969), and Stanford University (Ph.D., mineralogy, 1976).

At Stanford, Gene's doctoral thesis was a study of the Himalaya dike system, Mesa Grande district, San Diego County, California, and its gem tourmaline deposits. Thus began his career as a world-acclaimed expert on gem-bearing pegmatites, working for the U.S. Geological Survey first as a field and laboratory assistant (1970–1974), and then as a geologist – mineralogist from 1976 until his death in 1998. Gene's work on pegmatites included districts in California (Foord 1977, Foord & Mrose 1978, Foord *et al.* 1986, 1989, Stern *et al.* 1986, Taylor *et al.* 1979), Colorado (Foord & Martin 1979, Foord *et al.* 1984, 1995, Blasi *et al.* 1984, Kile & Foord 1998), Alabama (Foord & Cook 1989), Maine, New Hampshire, Brazil, Pakistan, Russia, and elsewhere. However, his geological and mineralogical work was by no means limited to pegmatites. Areas wherein he did notable field and laboratory work included: McDermitt, Nevada; the Golden Sunlight mine and the Stillwater complex, Montana; Round Mountain, Nevada (Shawe *et al.* 1984, Foord *et al.* 1988, Foord & Shawe 1989); Owyhee River, Nevada – Idaho (Foord *et al.* 1987); the Mescalero Apache Reservation, Hansonburg lead – zinc district, and Black Range, New Mexico (Moore *et al.* 1988, Taggart *et al.* 1988, 1989, Foord *et al.* 1985, 1991, Maxwell *et al.* 1986); the Wah Wah Mountains and Thomas Range, Utah (Shigley & Foord 1984, Foord *et al.* 1985); Alaska, U.S. Virgin Islands; Labrador; important studies of the mineralogy of the K–T boundary (Bohor *et al.* 1984, 1986, 1987); and the list goes on.

Gene was a superb, exquisitely careful, and tireless mineralogist. Throughout his career, he described or co-authored the first descriptions of some 25 new mineral species, a total which is expected to rise to approach thirty once studies now in press or in progress by his many professional colleagues are completed. His careful and thoughtful evaluation of minerals is evidenced by his precept about care in mineral identification, often voiced to colleagues and explained to interested amateurs: "never accept a tentative identification as certain until it has been confirmed by two or three independent methods of analysis". The extra time involved, which Gene was always willing to spend, helped prevent the pitfall all too commonly seen elsewhere, of assuming a mineral identity

Eugene E. Foord and Eugene B. Rynerson, mine owner (eponym of *rynersonite*, now deceased) at the portal of the San Diego Tourmaline mine, Mesa Grande district, San Diego County, California. Photo taken by J.E. Taggart during a field trip in 1986, on the occasion of the 14th General Meeting, International Mineralogical Association.

based on the apparent "best" match from only one analytical method; it was a rare, rare event (if ever) that Gene had to retract an announced identification. He was a particular believer in the value of optical mineralogy; microscopy often reveals important, otherwise unlooked-for features that would be totally missed by a simple XRD or microprobe analysis.

The first new species Gene described was corderoite, $Hg_3S_2Cl_2$, from the Cordero mine, Nevada (Foord *et al.* 1974), soon followed by the niobium – tantalum oxide rynersonite from the San Diego mine (Foord & Mrose 1978). Other new species described by Gene include: hashemite (Hauff *et al.* 1983), minasgeraisite (Foord *et al.* 1986), planerite revalidated (1986), aheylite (1986), zimbabweite (Foord *et al.* 1986), chestermanite (Erd & Foord 1988), scrutinyite (Taggart *et al.* 1988), grandreefite (1989), pseudo-grandreefite (1989), laurelite (1989), aravaipaite (1989), boromuscovite (Foord *et al.* 1991a), maxwellite and squawcreekite (Foord *et al.* 1991b), ferrisurite (1992), parafransoleite (1992), kosnarite (Brownfield *et al.* 1993), hogtuvaite (1994), mccrillisite (Foord *et al.* 1994), selwynite (1995), artroeite (1995), calcio-aravaipaite (1995), and meurigite (1996). The localities for these minerals encompass some six states of the U.S plus eight other countries. In addition to new species, Gene's research included major contributions to understanding or redefining such important minerals as the turquoise group, silver-bearing galena and the lead – bismuth – silver sulfosalts (Foord *et al.* 1988, Foord & Shawe 1989), tantalum – niobium oxides and rare-earth minerals, micas and clay minerals, amazonitic microcline, topaz, red beryl, and emerald, as well as studies on crichtonite, sugilite, thortveitite, and many other mineral species.

Collaboration in his mineralogical work with many people, both professional and amateur, from all over the world was an important part of Gene's life. He was always willing to examine a new or unusual specimen, and Gene would not give up until he was positive that he had made an accurate and thorough identification of the material, no matter how long or complex the investigation became. Gene has remarked that of all the new minerals he described, only one (boromuscovite) did he first collect himself; all the others were referred to him for study by geologists from mining companies, professional colleagues, or (very often) amateur collectors. Gene's collaboration with mineralogists from around the world was legendary; his own international visits took him to Russia, China, and Pakistan. Russia always had a special place in Gene's heart; he spoke fluent Russian (self-taught), and his field visits there included the Kola Peninsula, the Transbaikalia region of Siberia, and the Primorye region (Russian Far East).

Foordite, $(Sn^{2+},Pb)(Nb,Ta)_2O_6$, was named after Gene by Petr Černý and colleagues (Černý *et al.* 1988) in recognition of his many contributions to the study of granitic pegmatites and niobium – tantalum – tin minerals.

Gene contributed widely to scientific organizations. He was a long-time associate editor of *The Canadian Mineralogist* (*Ed. note*: five three-year terms of office, at his insistence, and still active until two months before his death), a Life Fellow of the Mineralogical Society of America, a Fellow of the Geological Society of America, and a member of the Mineralogical Association of Canada, Mineralogical Society of Great Britain, Microbeam Analysis Society, Society of Sigma Xi, Friends of Mineralogy (a past president of its Colorado Chapter), and Fluorescent Mineral Society. Gene was a Research Associate of the Denver Museum of Natural History, and shortly before his death, he was appointed a Consulting Editor to *Rocks and Minerals* magazine.

Gene's lifetime bibliography approaches 200 books, articles, abstracts, and maps; the references cited in this memorial represent only a small selection of his significant works. Several of the major works he valued most were completed and published shortly before his death, and will stand as monuments to Gene's broad-encompassing knowledge of mineralogy: *Mineralogy of Maine* (King & Foord 1995), *Minerals of Colorado* (Eckel 1997) and *Dana's New Mineralogy*, 8th edition (Gaines *et al.* 1997). Gene wrote for both technical and amateur audiences, and he was known for the many papers and lectures he presented at amateur mineralogical meetings in Denver, Tucson, Rochester, and elsewhere, as well as at professional meetings internationally. Several papers completed by his colleagues and co-authors have already appeared since his death, including Fisher *et al.* (1998) and Kile & Foord (1998, this issue).

Those of us who knew Gene during his three-year battle against lymphoma were tremendously impressed by his perseverance and will to fight this disease. Throughout this period, which included a bone marrow transplant, Gene continued to work on mineralogy, completing two major books and numerous papers and new mineral descriptions. Gene would come in nearly every day to work at his office and the X-ray and SEM laboratories at the USGS, both when actively employed and when temporarily on medical disability retirement status, ignoring his own discomfort or pain. In his honor, the USGS in Denver has named its Mineral Resource Surveys Team X-ray diffraction laboratory the "Gene Foord Mineralogical Laboratory", and the Geologic Division lecture room has been designated the "Eugene Foord Lecture Hall". Gene is survived by his wife, Suzann, their children Laura and Robert, and

his brother, Will; memorial trust funds for the Foords' children have been established at the Credit Union of Denver (telephone contact 303-236-3288). In accordance with Gene's wishes, in April 1998, his ashes were scattered on Gem Hill, San Diego County, California, near the San Diego Tourmaline mine, the site of his first pegmatite studies.

Gene is sorely missed by his family and his many friends and professional colleagues throughout the world. We all recall fondly the stories of his exploits in pursuit of mineralogical and geological knowledge, whether we shared them personally or heard them recited by Gene with his never-failing eager and animated passion: searching through the mines, quarries, and hills of Colorado, California, New Mexico, Nevada, and New England ; swimming in Lake Baikal; trekking perilously about the Pakistan – Afghan border to visit gem pegmatites; arguing (in Russian) with uncooperative travel or customs officials, or with armed Chinese guards trying to deny him a planned mine visit; toughing it out for many days through near-starvation with a field party on the coast of Labrador while storms prevented an airplane pickup; exclaiming over the wondrous objects preserved in museums, or over some new insight into a mineral's chemistry or structure as revealed through his X-ray camera or microscope. The stories and memories go on. Gene's contributions to the science of mineralogy remain as much in the memories of his friends, as in the scientific literature.

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Eugene E. Foord at the Tucson Gem and Mineral Show in February, 1997.
Courtesy of Joe Vajdak, Massapequa, N.Y.

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