

## Memorial of Edward J. Olsen 1927–2020

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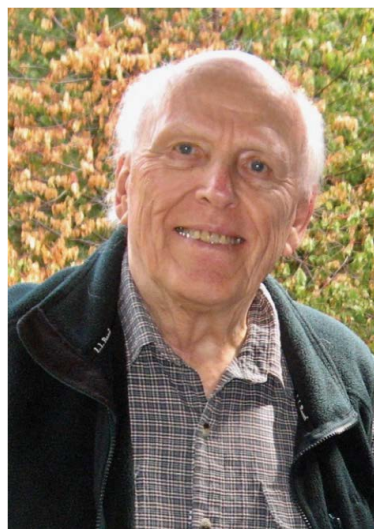
On January 30, 2020, the meteoritical community lost a remarkable scientist, mentor, colleague, and friend with the passing of Edward J. Olsen, at his home in Madison, Wisconsin. Ed is survived by his wife of 38 years, Lorain Olsen, his daughters Andrea Southwood and Ericka Olsen, and his grandson Jacob Taggart.

Ed spent most of his career, from 1960–1991, as Curator of Mineralogy and Meteorites at the Field Museum of Natural History in Chicago. Ed brought to his curatorship the scientific insights of a hard-rock field geologist and his long collaborative association with the University of Chicago and the faculty of the Department of Geophysical Sciences there. Importantly, for meteoritic scientists around the world, he opened up the collection with a spirit of generosity that prompted a “yes” to every legitimate sample request. He recalled turning down less than half a dozen requests over his 31-year tenure as curator.

When Ed started at the Field Museum, the nearby University of Chicago was a center of meteorite research, hastening his immersion into meteoritics. Bob Clayton and Ed Anders and their grad students and post-docs were a stimulating influence. The arrival of Ian Steele, Larry Grossman, Ian Hutcheon, and Andy Davis enhanced the collaborations. He also had a long association with Louis Fuchs at nearby Argonne National Laboratory. Ed and Lou published a number of notable papers, especially the detailed monograph on the newly fallen Murchison carbonaceous chondrite after Ed had managed to obtain the bulk of the Murchison fall for the Field Museum collection.

Ed enjoyed most of all exploring meteorite specimens for new minerals or structures overlooked by previous investigators. He had a good eye for the unusual, the advantage of a large collection available to him and could take large specimens, especially polished slabs, and pore over them by the hour looking for the unusual.

Ed achieved many firsts in his research career. He was the first to find phosphate minerals in iron meteorites. He was the first to find an amphibole group mineral in any meteorite. He, with colleagues, described several new minerals from meteorites: brianite, panethite, buchwaldite, galileiite, and krinovite, an unusual hybrid silicate composition. He was the first to predict that anorthosite and titaniferous pyroxene gabbros were major rock types on the lunar surface, before the return of the first collection of lunar specimens by Apollo 11. He was the first to find C3O xenoliths in a C1 meteorite. He was the first to find an inclusion of a silicate lithology within an IIIA iron meteorite (heretofore silicates had been found in types I, II, and IV irons, but IIAs



were considered the homes only of phosphate and chromite inclusions). He was the first to find that some carbonaceous chondrite metal was enriched in chromium and phosphorus, or in silicon. The Cr and Si contents were found to be consistent with nebular condensation.

Ed was happy to have been part of the first joint U.S.–Japan expedition to Antarctica to search for meteorites together with Bill Cassidy and Keizo Yanai. As Bill Cassidy noted, if no meteorites were recovered that first season, that would have been the end of the U.S. effort there, because the National Science Foundation’s Antarctic branch was dominated by biologists who did not think much of spending money and aircraft support for such a project. Luckily, they struck it rich and the program continued. This led to Ed’s invitation by Blythe Robertson of the Geological Survey of Canada a few years later to be part of the first expedition to the Canadian arctic to search for meteorites on the ice caps of Devon Island and Ellesmere Island.

Ed was born and raised in Chicago and all of his schooling was completed within the South Side neighborhood of Hyde Park. After graduating from Hyde Park High School, toward the end of World War II, he was drafted into the U.S. Army. His service yielded the benefits of the GI Bill, enabling him to attend the University of Chicago and earn an undergraduate degree in Geology.

Ed began his career as a field geologist, mapping upper Cretaceous sediments and lower Tertiary alkaline volcanic in the Bearpaw Mountains of north central Montana with the U.S. Geological Survey. He spent the better part of a decade mapping

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Precambrian back basin metasediments and metavolcanics in the Labrador Trough in northeastern Canada, working first for the Geological Survey of Canada and then with the Canadian Johns-Manville Co, Ltd. Also with Johns-Manville he did field mapping of peridotites and associated metagabbros along the north coast of Newfoundland, and mapped the exotic rocks called roddingites that occur in the serpentized peridotites of the Eastern Townships of Quebec (and all the way down the Appalachian orogenic belt, wherever serpentized peridotites occur).

During this decade of fieldwork he completed his Ph.D. in Geology at the University of Chicago. His thesis provided the basis for what he considered one of his best papers, a set of thermodynamic calculations that permitted the determination of the specific temperature and partial water pressure of serpentinization. This involved the reduction of the degrees of freedom in the calculations by considering the presence of all the phases present in the hydrothermally altered rocks, including metal alloys.

In addition to meteoritics, he formed a long and pleasant association with Arnold Friedman of the Chemistry Division at Argonne National Laboratory to study the chemistry of early New World copper-based artifacts (esp. Inca and Moche). This work led to a scheme whereby one could assign a probability to the source of the copper ore used to create primitive implements: a metal source or an oxidized (oxide, carbonate, sulfate) source.

Finally, following the Cretaceous-Tertiary extinction hypothesis, Ed became allied with George McGhee, a paleontologist at Rutgers University and an authority on the major extinction that took place within the upper Devonian, the Frasnian-Fammenian extinction. They worked together for several years with Carl Orth of Los Alamos National Laboratory to see if an iridium event marked this extinction horizon. After a couple of false reports by other groups, it became clear that there was no geochemical evidence that this extinction was caused by a single impact.

For many years Ed was associated with Prof. Harry Nelson (astronomy and mathematics) of Augustana College, Rock Island, Illinois, where Ed lectured frequently and was part of an Augustana Space Week Symposium with Neil Armstrong. For services rendered to Augustana, Ed was awarded an Honorary Doctor of Humane Letters in 1978.

After retirement from the Field Museum in 1991, Ed continued research for another decade as an adjunct faculty member in Geophysical Sciences Department at the University of Chicago. During these years he also acted as a consultant for an exhibit design company for Earth science and planetarium exhibits in museums in several U.S. cities.

Ed enjoyed his career and the personal friendships he formed with many colleagues, especially Robert Hutchison, Ian Steele, Louis Fuchs, Toshiko Mayeda, Mike Lipschutz, Ian Hutcheon, Ted Bunch, and Kurt Frederickson. Near the end of his working career he learned from a colleague that the IAU had named an asteroid after him, 4966EDOLSEN; he greeted the news initially with sincere disbelief.

Friends and colleagues alike will remember Ed for his exuberant enthusiasm over a wide arena of interests in history, literature, languages, music, and science. He was a man of immense good humor who could discuss most any subject with erudition and wit. He canoed the boundary waters of Canada, appeared on the stage of the Lyric Opera of Chicago as a supernumerary, and was the only person to have a poem he wrote (a cosmic excursion into the world of dubious definitions of the word "chondrule") published in *Geochimica et Cosmochimica Acta*!

Ed had a deep appreciation for the natural world and spent many happy years in retirement with Lorain at their home in the woods of Wisconsin, observing the abundant wildlife there. He lived a full life of scientific contributions, lively engagements with friends and colleagues, and disparate and deep interests. He will be missed.