# The Clay Minerals Society

## In Memory of Robert Coltart Reynolds Jr.

*October 4, 1927–December 12, 2004*

Bob Reynolds in 1983-1984. Photo from Dartmouth College's archives.

Born to Ludmilla and Robert C. Reynolds Sr. on October 4, 1927, in Scranton, PA, Robert C. Reynolds Jr. was a 1945 graduate of Dalton (PA) High School. After serving in the Army Air Force, he graduated from Keystone Junior College and Lafayette College. He then earned his doctorate from Washington University in St. Louis in 1955. After working for Pan-Am Petroleum for five years, he went to Dartmouth College in 1960 where he rose to the Frederick Hall Professor of Mineralogy Chair. Prof. Reynolds, a Distinguished Member of The Clay Minerals Society and a Brindley Lecturer, was president of the Society in 1991–1992. He received the Roebling Medal from the Mineralogical Society of America, its highest award and recognition. The Clay Minerals Society has created a Robert C. Reynolds Jr. Research Award and supports the awarding of the Reynolds Cup at a biannual contest to quantitatively analyze samples of mixtures of clay-size minerals. He leaves behind, in addition to the inspiration he has given to generations of students, a long list of seminal papers. Perhaps the most influential of these is his 1967 paper in volume 52 of *American Mineralogist*, "Interstratified clay systems: calculation of the total one-dimensional diffraction function", which is the basis of his computer program, NEWMOD©. In 1994 he added WILDFIRE©, a program for calculating the three-dimensional X-ray diffraction tracing of illite polytypes and degrees of disorder in illite and illite–smectite mixed-layered minerals. It is not an exaggeration to say that these programs have revolutionized the way in which clay minerals and other layered minerals are studied.

Professor Reynolds's journey through life ended on Sunday, December 12, 2004. In the course of that journey, he accomplished much and touched the lives of many. Robert (Bob) C. Reynolds Jr. grew up in tiny Dalton, just 12 miles from Scranton. How tiny you ask? There were 16 in his 1945 high school graduating class, 14 of whom had been in the first grade with him. While at Lafayette College, he married Roseann Fabio from Scranton. They had met and become sweethearts while in high school. They had three children, Fayette, Jolene, and Bob III. Fate brought Bob and John Hower together at Washington University, where they met standing in line to register for classes. They became lifelong friends in the fullest sense of the word. At Dartmouth College, Bob became an institution. He was too broad a man for any one of us to have known him completely. He is remembered by each person he touched, but each in a different way. The composite of these memories, some of which are expressed below, conveys the sense of this influential man.

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Bob was known as an outstanding teacher amongst the geology students at Dartmouth. I remember Bob's teaching style as a mix of clear explanations, organized lecture style, practical lab exercises, hands-on review sessions, experiments and field trips, and use of humorous and illustrative analogies (e.g., in an undergraduate mineralogy class, deconstructing the complexity of XRD patterns by drawing an elephant on the board and asking us what it was, then pointing out that these XRD patterns he was showing us were no more than mere representations of mineralogical structures, much like his elephant was just a representation of a living creature). Outside of the classroom, Bob's humbleness sometimes made it hard for him to understand that he understood his field at a level that left him with few peers. This did not translate to his classes, which were so well taught, but rather to the informal conversations that groups of students and faculty have together. I remember leaving his office with other grad student colleagues and professors and just marveling, both at Bob's wondrous mind, and also his cluelessness about how smart he really was.

Jim Aronson, Page Chamberlain, Mike Poage, and I went to see Bob and Roseann a couple of years ago. After a while Roseann left the room. Bob peered around the corner, said, 'Is she gone?' then pulled out a cigarette and lighter. He was on $O_2$ and had a hissing supply tank over in the corner of the room. As he flicked the lighter, all four of us flinched, our faces showing fear of explosion. Bob chuckled and said 'Don't worry, I've done the calculations, there's not enough free oxygen in the air to cause an explosion.' We all laughed, in part because it was so fun to laugh with Bob, perhaps in part due to nervous release, but it summed up so much about Bob—his hell-be-damned attitude and penchant for living on the edge, his boyish approach to certain things (as if Roseann leaving the room for five minutes would keep her from knowing that he had just smoked), and his analytical approach to life.

**Peter Ryan**

When we were students at Dartmouth, we all called him the Big Guy, and thoroughly meant it in scientific stature, love and zest of life, total inspiration, and not just girth.

**Dougal McCarty**

Bob and Denny (Eberl) taught me how to climb when I first got to Dartmouth, and I climbed quite a bit with Bob in those days. When I was finishing my Master's with Bob at Dartmouth, he just sent me to John (Hower) to do a PhD; I never asked what I should do next or about continuing grad studies; Bob just SENT me to John. It was like he was giving me to his friend. He was so goddamned strong and energetic as a young man; I guess that's how he survived so long with all the alcohol and cigarette smoke he pumped into himself. I'm still coming to terms with his dying.

**Gray Thompson**

The most distinctive aspect of Bob Reynolds for me is that I have never run into anybody who had an unkind thing to say about him. How can someone who has been such a leader, who has had to make tough decisions, accomplish this? I don't have the answer. Perhaps it was his exercise of tolerance for the views of everyone, not just the elite; perhaps it was that such a great scientist could be so modest; perhaps it was his finely tuned sense of fairness; perhaps it was his great sense of humor. Whatever it was, I hope we as a clay society can find a way to honor him for being such a great scientist and a great person.

**Herman Roberson**

I know Professor Reynolds as a brilliant scientist, and without any exaggeration one may state that he is the best-known expert in the world on X-ray diffraction analysis of finely dispersed layer compounds and, first of all, of clay minerals.

**Victor Anatolievitch Drits**

Bob always had to do things for himself. He didn't just use someone's equation. He had to derive the whole thing to be sure he understood it and that it was correct. He was very "hands on" in the lab and in everything. When he needed to know the time of day, he'd build a clock! Fred Mumpton once told me that Reynolds' papers were just about the only ones submitted that needed no editing. They were always perfect. Hower said Reynolds was the smartest person he knew.

**David Pevear**

Some things you might not have known about Bob Reynolds: The day he was awarded the title Distinguished Member of CMS, he came to the room almost disabled with astonishment. I think his humility prevented him from anticipating that others saw him in that category. Or, that he really appreciated classical music. His favorite piece was Mahler's Ninth Symphony. Or, that there was a Mozart piece that he associated with working with John Hower in Venezuela and, when he heard it, it brought tears to his eyes. Or, that he was a student of World Wars I and II. Or, that he built his own rifle from scratch. Or, that he changed the shock absorbers on his motorcycles every 5000 miles whether they were apparently worn or not. Or, that he delighted in the challenge of identifying mushrooms and then testing that identification by eating them. He was full of stories about the awful things the wrong mushrooms would do to you. Or, that if *you* were interested in something, *he* was interested in it.

I loved him; we all loved him.

**Dewey Moore**

## STUDENT RESEARCH GRANTS AWARDED

The CMS congratulates the following eight students upon receiving research grant awards for 2004:

Michael K. DeSantis, University of Cincinnati, "Regional Correlation of the Tioga K-bentonites Cluster Using Apatite Trace Element Fingerprinting"

Cinzia Fissore, Michigan Tech, "Effect of Temperature and Clay Minerals on Long-term Soil Carbon Stabilization"

Michelle Leigh Foster, The University of Montana, "K-Bentonites in the Belt Supergroup, Montana"

Debra Jennings

Deb Jaisi

Pankaj Kulshrestha

Deb P. Jaisi, Miami University, "Investigation of Microbially Mediated Clay Mineral Reaction"

Debra S. Jennings, University of Kansas, "A Paleoenvironmental Analysis of Morrison Formation Deposits, Big Horn Basin, Wyoming: A Multivariate Approach"

Pankaj Kulshrestha, SUNY–Buffalo, "Investigating the Molecular Interactions of Oxytetracycline in Clay and Organic Matter"

Scott Mitchell, Brigham Young University, "An Improved MUSIC Model for Gibbsite

Gayle Anthony Ordway, Portland State University, "Origin of Vermiculite in Well-drained Soils of the Southern Oregon Coast"

## STUDENT RESEARCH GRANT APPLICATIONS

### DUE MARCH 21, 2005

Grant applications for partial financial support of master's and doctoral student research in clay science and technology are due at the Society Office by March 21. Applications will be judged based on the technical quality of the research proposal, the qualifications of the applicant, and financial needs of the research project. The grants in amounts of up to $2500 each will be awarded by September 2005. There is no restriction with regard to nationality, and a student does not need to be a member to apply. Application forms and instructions are available at **www.clays.org** or from the Society Office (**cms@clays.org**). Electronic submission is preferred.

## STUDENT TRAVEL GRANT APPLICATIONS

### DUE MARCH 21, 2005

Grants in amounts of up to $500 per grant for students travelling within the country or region of the CMS Annual Meeting and in amounts of up to $1000 per grant for students travelling overseas to the meeting are due at the Society Office by March 21. There is no restriction as to nationality. Students must submit an abstract for either an oral or poster presentation to the CMS Annual Meeting (www.middlebury.edu/cms). Application forms and instructions are available at **www.clays.org** or from the Society Office (**cms@clays.org**). Electronic submission is preferred. Applicants will be notified within about six weeks, in time to make travel arrangements for the meeting.