



The Clay Minerals Society

www.clays.org

THE PRESIDENT'S CORNER



These days the quickest way for anyone wishing to obtain information about almost anything is to use the Internet, and so anyone wanting to find out what The Clay Minerals Society is and what it does will first find their way to the Society's website, www.clays.org. Consequently it is vital that our website be easy to use and kept up to date.

The CMS website was re-designed a couple of years ago, and renewed efforts have been made recently to update the information on its numerous pages. This is no easy task, and a number of members have contributed to pages relevant to their responsibilities. The co-ordinator of the information is the new Chair of the Committee on Electronic Communication, Covadonga Brime (University of Oviedo), and the technical changes are made by our webmaster Gordon Nord at the Society's office. Please visit the website, where you will find a lot of useful information on all the activities of the Society. If you see anything that needs to be updated, please contact Covadonga at brime@geol.uniovi.es.

I hope you find the accompanying article about Haydn Murray as fascinating as I did. Haydn has had an extremely interesting life, much of it involved with an incredible variety of applications of clays, and his breadth of knowledge of clays is unsurpassed. He is a much respected father figure in CMS – he has made many valuable contributions to the Society and hopefully will continue to do so for many years yet.

Finally, congratulations and grateful thanks to Editor-in-Chief Joe Stucki and Managing Editor Kevin Murphy for the massive amount of work they accomplished in producing one of the largest volumes of *Clays and Clay Minerals* in many years. Volume 57 for 2009 contained 71 papers in 822 pages.

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THE SOURCE CLAYS REPOSITORY

Even in relatively "pure" clay deposits, the assemblage of minerals and their compositions can change significantly within a few centimeters. In the early 1970s, the Clay Minerals Society recognized the need for a collection of clays from which researchers could obtain identical samples from a large stock of homogenized material. Largely through the leadership of William F. (Bill) Moll at Georgia Kaolin Company, but with the support of many individuals in the clay minerals industry and the Clay Minerals Society, the Source Clays Repository shipped its first materials in early 1973. The Repository was originally housed at the University of Missouri but moved to Purdue University (Indiana, USA) in August 2002, where it currently resides.

The Source Clays Repository contains two types of materials, the *Source Clays* and the *Special Clays*. The Source Clays consist of 8 different materials (KGa-1b, KGa-2, PFI-1, SHCa-1, STx-1b, SWy-2, Syn-1, and SAz-1) available in 125 or 250 gram units. For each Source Clay, sufficient raw sample was collected to provide one metric ton of processed material. Each sample was dried at low temperature, homogenized, and pulverized, and then stored in polyethylene bags. SAz-1 is currently depleted, but it is planned to obtain additional material this coming summer. The Special Clays consist of materials that have not been



Dr. Gnanasiri (Prema) Premachandra (right) and Chelsea Page (left) pose in front of some Source Clays ready for shipment. Prema manages the day-to-day operation of the Source Clays Repository, while Chelsea, a student worker, handles packaging and shipping.

to almost a kilogram of material. The Grim Collection is available to researchers who wish to utilize a significant number of the samples from the collection in their research.

More information about the Source Clays is available on the Clay Minerals Society website (www.clays.org).

Darrell Schultz

HAYDN HERBERT MURRAY – 2009 PIONEER LECTURER



Once upon a time on a farm near Kewanee, Illinois (USA), a bright high school senior, who was also a pretty good football player, had a particularly inspiring science teacher. This teacher took his class on a field trip to a nearby coal mine. Our bright high school senior was impressed enough with the operation that he decided he wanted to be a

mining engineer. Among the schools interested in him as a football player, one emphasized the quality of their Department of Mining Engineering—the University of Minnesota. In 1942, the young man chose this as the place to pursue his interests.

Haydn Herbert Murray enrolled in college just before turning 18 years old, when he became eligible for the military draft as World War II was in full swing. He completed two semesters and half of the spring semester before entering the Army. Prophetically, he was shipped to Camp Wheeler, Georgia. At the time, he did not realize that the land on which Camp Wheeler was located was actually owned by Georgia Kaolin Company but had been assigned to the U.S. Army under "eminent domain" until 1947. Fifteen years later he joined Georgia Kaolin Company.

After his basic infantry training was completed, the Army sent him to the Army Specialized Training Program of the University of Alabama to study basic engineering subjects, one of which was geology, which he particularly liked. Later this interest was reinforced in the Philippines, where he worked with volcanic ashes and soils while building airstrips and roads. At the University of Alabama, he applied to the Officer Candidate School at Fort Belvoir, Virginia, and was accepted. He graduated from OCS on December 12, 1944. He had been told that he would probably be in the United States for at least six months. With this news, he married his high school sweetheart, Juanita Ara Appenheimer, on

December 16. Eleven days later he was ordered to report to Fort Lewis, Washington. When he checked in, the desk sergeant said, "Lt. Murray, you are alerted for immediate overseas duty." He boarded a troop ship in Oakland, California, on February 5, 1945. When he arrived in New Guinea, he was assigned to the 856th Engineer Aviation Battalion on the island of Biak*, which is 50 miles north of New Guinea and 50 miles south of the equator. After duty on Biak, the battalion was sent to the Philippines to repair and refurbish the airport at Nichols Field on Luzon near Manila.

After being discharged in August 1946, Haydn used the G.I. bill benefits to enroll at the University of Illinois, where he received three geology degrees in just five years. After completing his master's degree in igneous petrology, he accepted a fellowship funded by Illinois Clay Products and offered to him by Dr. Ralph Grim. He says, "It was one of the best moves I ever made." Grim had transferred to the Geology Department in 1948 after a 16-year career at the Illinois Geological Survey, so Haydn became Grim's first PhD student and a clay mineralogist. His dissertation was titled "The Structure of Kaolinite and Its Relation to Acid Treatment." In 1951, Grim recommended Haydn for a faculty position at Indiana University and for appointment as the clay mineralogist at the Indiana Geological Survey.

During his first year of teaching, Haydn attended the first Conference on Clays and Clay Minerals at the University of California, Berkeley. At this meeting, The Clay Minerals Committee was formed, with Ralph Grim as chairman. The National Academy and the National Research Council supported the Clay Minerals Committee for the next 12 years. At the 11th meeting of the group, in Ottawa, Canada, the NAS-NRC proposed that the Clay Minerals Society be formed, and the Clay Minerals Committee appointed Richards Rowland from Shell Oil, James Early from Gulf Oil, and Haydn Murray to charter The Clay Minerals Society, which was accomplished on July 18, 1962, as a 501(c)3-tax-exempt organization.

In 1957, Haydn resigned his positions at Indiana University and the Indiana Geological Survey to become the Director of Research and Development at Georgia Kaolin Company. What attracted Georgia Kaolin to Haydn was his work on factors that influenced the viscosity of kaolins at 70% solids. At Georgia Kaolin, he hired a first-rate group of clay mineralogists and chemists: Wayne Bundy, Robert Conley, Jack Harrison, William Moll, Colin Harvey, Andy Torok, Joe Weiss, and Tom Thompson. This group developed several new products for paper coating and filling, paint, ceramics, plastics, and other uses.

Haydn's career at the Georgia Kaolin Company advanced with managerial appointments: Manager of Operations (1961), Vice President of Operations (1963), and Executive Vice President and Chief Operating Officer (1964). In the mid-1960s, Georgia Kaolin expanded through acquisitions: Benton Clay Company, located in Casper, Wyoming; Southern Clay Products, in Gonzales, Texas; New Zealand China Clays, in Maungaparerua, New Zealand; and a joint venture with Amberger Kaolin in Hirschau, Germany. These acquisitions gave Haydn an opportunity to learn about the applications of sodium and calcium bentonites, halloysite, and European kaolins. At Georgia Kaolin Company he had the opportunity to visit and evaluate many large kaolin deposits in Australia, on the island of Belitung in Indonesia, in South Africa, and in Mexico.

In 1973, Haydn returned to Indiana University as head of the Geology Department, a position he held until he left the teaching faculty in 1984 to focus on research. At Indiana he had an outstanding group of PhD students: Wayne Bundy, Jack Harrison, Colin Harvey, Robert Pruett, Tom Dombrowski, Jessica Elzea-Kogel, Jun Yuan, Roland Merkl, Tim Salter, Karen Keith, and Huitang Zhou. His doctoral students did theses on kaolins in Saskatchewan and China, halloysite in New Zealand, bentonite in Wyoming, and palygorskites in South Georgia, North Florida, and China. In all, Haydn has 96 theses on his shelf.

Haydn's international work expanded at the same time he returned to Indiana University. In 1973, Haydn chaired the UNESCO Kaolin Genesis Committee, which was formed by Milos Kuzvart of Czechoslovakia. This group sponsored annual field excursions and conferences to study and report on kaolin deposits throughout the world. In 1984, he was asked by the Agency for International Development (AID) of the State Department to evaluate the clay deposits in Egypt. In 1985, he was asked by the Geological Survey of Chile to visit and evaluate Chilean industrial mineral operations. After he retired in 1994, Haydn formed a consulting company, H. H. Murray and Associates, whose activities took him to kaolinites in Argentina, Australia, Brazil, Canada, and China; to bentonites in Argentina, Germany, Italy, Great Britain, and the United States; and to palygorskites in the United States, China, and Senegal.

Over the years, various professional organizations honored Haydn. He served as president of The Clay Minerals Society in 1965; the Society for Mining, Metallurgy, and Exploration in 1988; the American Institute of Professional Geologists in 1991; and the International Clay Minerals Group in 1993. He was awarded the SME's Hardinge Award in 1976. At the 2000 International Clay Conference, he was awarded an Honorary Doctor of Science degree from the University of Buenos Aires. In 2003, Haydn was elected to the National Academy of Engineering and he received the Department of Geology Alumni Achievement Award from the University of Illinois. In 2004, he received an honorary Doctor of Science degree from Indiana University, which especially pleased him because it was from his peers. In 2006, he served as vice-chair of the Peer Evaluation Committee in Section 11, Earth Resources Engineering of the National Academy of Engineers, and two years later he chaired this committee.

Haydn has published over 200 papers, chapters in books, and two books; he holds four patents. His latest book, *Applied Clay Mineralogy* (2007), sums up his experience as a productive clay mineralogist for 60 years. Looking back, Haydn says there is very little he would change. As Professor Emeritus of Economic Geology, Clays, and Industrial Minerals, he plans to continue his activities as long as he is able. He believes the best and highest-quality kaolin deposits are located in the Capim Basin in Brazil, the best sodium bentonites are in Wyoming, and the best calcium bentonites are in Greece, Italy, and Germany. He is currently involved in the study and development of a large palygorskite deposit in China. In addition, he is continually working on the kaolins of Georgia and adjusting his ideas on their environment of deposition and the effect of postdepositional alteration. Also, he is involved in exploration for bauxite with specific alumina, silica, and iron contents in Brazil and Suriname.

Combining Walter Keller's donation of 650 specimens of clays and bauxites with Haydn's 600 specimens probably makes the Indiana University collection the largest collection of clay minerals anywhere. Haydn has a very well-equipped laboratory for the study of clay minerals, which is now run by David Bish, who holds the Murray Chair of Applied Clay Minerals, established by Haydn and Juanita Murray in 2001. These facilities give Indiana University an active and ongoing clay minerals program.

Dewey Moore and Shelley Roberts**

* For an impression of what life was like for Haydn in the Pacific during WWII, see www.ibiblio.org/hyperwar/AAF/VII/AAF-VII-10.html.

** The authors found Wayne Bundy and Jessica Elzea-Kogel's interview of Haydn in the *CMS News* (Spring 1998) to be helpful.