Colleagues and Friends Remember Milton Wadsworth, 1983 TMS President

Milton Wadsworth's brilliance reached far beyond the walls of his research laboratory. While an internationally recognized pioneer in new approaches and understanding in extractive process metallurgy, it is the lives and careers that he touched with his warmth, intellectual generosity, and adventurous spirit that serve as his true legacy to materials science and engineering (MSE), as well as society as a whole. He passed away in January at the age of 90.

"His influence extended to all dimensions of life and was not limited to the Butler-Volmer equation, to activation energies, or to absolute reaction rate theory," said Jan Miller, Chair, Department of Metallurgical Engineering, University of Utah, in his eulogy honoring Wadsworth. "Milt was able to communicate the beauty of metallurgy and science to the general public. He was an excellent spokesperson for science and all who listened benefited from his wisdom and understanding."

The focal point of Wadsworth's professional life was the University of Utah (UoU), where he earned both his B.S. in metallurgical engineering and a Ph.D. in metallurgy, and then continued to build a 45-year academic career, starting as an assistant professor and eventually being named a Distinguished Professor of Metallurgy in 1983. He also held a number of administrative positions at UoU, including two separate terms as Department of Metallurgy chair, Utah Mining and Minerals Resources Research Institute director, and College of Mines and Earth Sciences dean. He joined TMS in 1947, was named a TMS Fellow in 1976, and served as TMS President in 1983 and AIME (American Institute of Mining, Metallurgical, and Petroleum Engineers) President in 1991. His numerous awards and honors include four AIME best paper awards, the 1978 James Douglas Gold Medal, and AIME Honorary Membership in 2009.

While most known for his research interests in hydrometallurgy, Wadsworth also contributed to the understanding and progress of many other topics, including flotation, cementation, roasting, oxidation of metals, electrochemistry, thermodynamics, and kinetics.

Among his many contributions, Wadsworth stressed the importance of being active in professional organizations. "I would not be involved in TMS to the extent I have been without his early encouragement," said Ray Peterson, 2009 TMS President.

"Milt took a different approach to understanding the reactions that were occurring in extractive process metallurgy," said Ray Peterson, Director of Technology, Aleris International, and 2009 TMS President. "Mining and mineral processing was a relatively old field, but the fundamental processes were not very well understood or quantified. He studied many processes at a fundamental level and then built mathematical models that described the reactions. He brought a new rigor to the description of processes."

"Milt recognized years ago the power that computational modeling could bring to engineering and he encouraged its application in hydrometallurgy and other fields," added Garry Warren, University of Alabama Professor and 2011 TMS President. "I sometimes wonder what he could have accomplished if he had at his fingertips our current computational tools."

Wadsworth's list of professional accomplishments could have filled volumes, but Warren noted that he was a modest individual who valued the people around him most. This was particularly evident in his relationships with his students and the small army of young MSE professionals that he mentored through the years.

"Milt was so much fun to sit down and talk with, especially when I was a graduate student," recalled Warren. "That is something I have tried to emulate with less success. He could so easily speak to students about technical topics in ways that were not only humorous, but elucidating."

"Dr. Wadsworth showed me how to be a good leader through listening and caring," echoed Peterson. "No matter how busy he was with his research or his duties as college dean, he would listen to his students and give advice whenever asked. Also, due to his involvement in TMS, he stressed the importance of being active in your professional organization, both for your own improvement and for the betterment of your profession."

In addition to his professional contributions, many of Wadsworth's friends and colleagues cherish the stories of a man who embraced all that life had to offer. This includes his service during World War II as a U.S. infantry officer; his marriage of 69 years to his wife, Mirian and devotion to their six children and 19 grandchildren; and his love for big motorcycles, fast cars, and tap dancing.

Peterson recalled a graduate student gathering that highlighted both Wadsworth's talent and his personality: "To our amazement, Dr. Wadsworth told us he would like to perform. He then laced up his tap shoes and gave an impromptu performance. He amazed us with his speedy footwork and grace. Imagine our shock at watching the dean of the college dancing away with no regard to his studious professional image. We learned then that it was all right to show your fun side."

Meet a Member: Peter Hosemann Forges a Materials Science Career

By Lynne Robinson

Horseshoes, in many cultures, are thought to bring good luck. Peter Hosemann, assistant professor at the University of California, Berkeley, would certainly agree, since he points to his days as an apprentice farrier—a specialist in shoeing and caring for horses' hooves—as his introduction to the world of materials science.

Growing up primarily in Vienna, Hosemann worked for a Viennese fiaker—a horse carriage driver who gave guided tours of the city—as a teenager. Through this experience, he met Johann Langer, a farrier who set about teaching Hosemann the art and science of shaping and forming steel into individually crafted horseshoes.

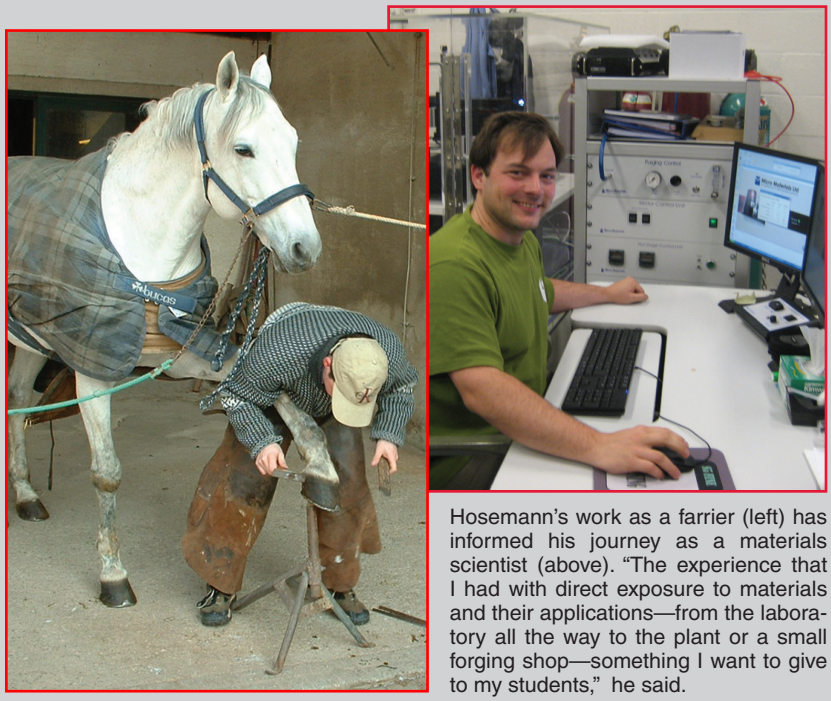
Hosemann was also enrolled in a high school that specialized in mechanical engineering and quickly saw the connection between his work and his studies. "I knew at this point that all the [mechanical engineering] designs I envisioned were limited by the materials available," recalled Hosemann. "Being exposed to someone whose profession involved shaping steel with his hands triggered my interest to learn more. The ability to judge a material's temperature by simply looking at its color, as well as determine its hardness during simple water quenching and reheating, was fascinating to me."

After graduating from high school, Hosemann served a stint in the Austrian army, returning to Vienna after his discharge to work for Langer full time and to participate in competitive horse driving events. "While I did enjoy what I was doing, my curiosity about materials and their properties increased to the point where I wanted to learn more beyond my experiences," he said. He decided to enroll in Austria's Montanuniversität Leoben to study materials science—ultimately earning both a master's and Ph.D. from there—while still working as a farrier part time. During his first year at the university, Hosemann became interested in atomic force microscopy (AFM). "I was amazed that you could image nanometer-scale structures by simply scanning a tip across a surface," he said. "Horseshoeing before classes and conducting AFM measurements after classes provided an interesting contrast."

Augmenting Hosemann's studies were experiences that he gained in industry through internships in steel plants and start-up companies. A summer internship on liquid metal corrosion for the MEGAPIE project at the Paul Scherrer Institute, Switzerland, put him in contact with researchers from Los Alamos National Laboratory (LANL), who invited him to intern there the following summer. Once he completed his master's degree, he returned to LANL to work on his Ph.D. thesis and then stayed on as a postdoctoral researcher. He recalls that he started his career in the United States with just one suitcase in hand, packed with a few clothes and "Austrian essentials"—chocolate, pumpkin seed oil, and schnapps.

Today at Berkeley, Hosemann's research focuses on developing a basic understanding of materials degradation processes in a nuclear environment and their impact on engineering applications. While that seems a little far removed from his farrier days, Hosemann notes that the lessons and mindset that he learned at the forge influences his approach to teaching.

"It is very important for me that students learn all aspects of materials science and its applications, from materials use and manufacturing down to atomic behavior and characterization," he said. "While I teach my students the science, I make sure they never forget about the application and fabrication at the end."



Hosemann's work as a farrier (left) has informed his journey as a materials scientist (above). "The experience that I had with direct exposure to materials and their applications—from the laboratory all the way to the plant or a small forging shop—something I want to give to my students," he said.

Each month, *JOM* profiles a TMS member and his or her activities both in and out of the realm of materials science and engineering. To suggest a candidate for this feature, contact Lynne Robinson at lrobinson@tms.org.