



WEDNESDAY COMMUNIQUÉ

October 26, 2011

NAE Grand Challenges: At the request of the National Science Foundation, the National Academy of Engineering (NAE) assembled a panel of experts to identify the grand challenges of engineering in the 21st century. With input from around the world, the panel identified the following 14 challenges in 2008; Make solar energy economical, provide energy from fusion, provide access to clean water, reverse-engineer the brain, advance personalized learning, develop carbon sequestration methods, engineer the tools of scientific discovery, restore and improve urban infrastructure, advance health informatics, prevent nuclear terror, engineer better medicines, enhance virtual reality, manage the nitrogen cycle, and secure cyberspace. Some of these problems are being addressed by the work of UNM engineers and scientists as illustrated by the work of the Integrated Sustainable Energy Systems Laboratory of the Mechanical Engineering Department at: <http://iseslab.unm.edu/>. For more information about the grand challenges see <http://www.engineeringchallenges.org/>.

James F. Zimmerman: Our main library and one of the most prestigious awards of the UNM Alumni Association are named in honor of past president James F. Zimmerman. The following is excerpted from the *Journal of Anthropological Research*, Vol. 59, No. 3, Fall 2003. "In 1925, UNM hired James Fulton Zimmerman as Associate Professor of Political Science. Zimmerman was born in 1887 in southeastern Missouri, the son of a judge and state legislator. He went on to Vanderbilt University from 1908 to 1913, receiving a B.A. and an M.A. He taught in various schools in Tennessee and was an instructor in economics and sociology at Vanderbilt in 1917–1919. He was a graduate student at Columbia University from 1919 to 1923, receiving his Ph.D. in 1925. While writing his dissertation, Zimmerman (1925) worked as Assistant Executive Secretary of the Institute of Social and Religious Research in New York City. Working for the institute gave Zimmerman a broad exposure to organized university research and institutional structures and procedures, as well as many national-level connections. Zimmerman was appointed Acting President of UNM on February 15, 1927; a month later he was offered the permanent presidency, to begin the following September. From the day he first took office until his untimely death in 1944, Zimmerman worked tirelessly—and very effectively—on many fronts to grow the UNM physical plant, the student body, the faculty and its research capabilities, and its statewide influence, especially, as he said in a letter to A. V. Kidder in 1928 (Zimmerman to Kidder 6/27/28, ZC), in "those fields of research which are peculiarly adapted to the environment of the University." Zimmerman (in collaboration with E. Hewett) founded the UNM department of Anthropology. On June 4, 1928, James Zimmerman was formally inaugurated as President of UNM in a ceremony combined with commencement. The governors of the eight northern Pueblos were present to formally "adopt" Zimmerman and Ray Lyman Wilber, President of Stanford University, on the steps of the UNM Estufa." For another interesting story, Google "Estufa."

First Digit Phenomenon: Does nature play favorites with numerical digits? In the 1990s I was visiting Professor Theodore Hill, a member of my Ph.D. committee, when he told me that he was applying "Benford's Law" to detect anomalies in data. I was intrigued as he tried to convince me that all numbers are not created equal and that in most "real" sources of data, the leading digit is one (1) more than 30% of the time, that it is two (2) about 18% of the time, and so on. Indeed, if you were to collect all the data you encounter today (numbers in the daily lobo, measurements in the laboratory, temperatures, etc.), you can

verify for yourself that the most significant digit is more likely to be one (1) and least likely to be nine (9). Why this happens is a mathematically interesting phenomenon that has been used to detect tax and election frauds. More information may be found at the web site: <http://www.benfordonline.net/>.

A PDF version of this communiqué is available at: <http://provost.unm.edu/communique/index.html>.

Your feedback and input is welcome at: provost@unm.edu.

Sincerely,

Chaouki Abdallah

Interim Provost & Executive Vice President for Academic Affairs