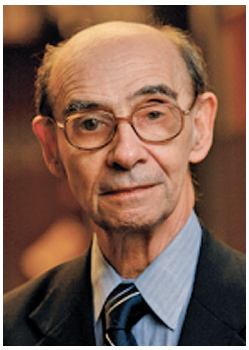

S. Shore

Sheldon Shore (1930–2014)

Sheldon G. Shore, Distinguished Professor of Mathematical and Physical Sciences and Charles H. Kimberly Chair of Chemistry at The Ohio State University, died on April 4th, 2014. Shore was born in Chicago on May 8th, 1930, and obtained his bachelors degree from the University of Illinois, Urbana-Champaign, before attending the University of Michigan, Ann Arbor, where he obtained his MS in 1953 and his PhD in 1957, under the direction of Professor Robert Parry. He then joined The Ohio State University as an assistant professor, was promoted to professor in 1966, and retired in the summer of 2013, after 55 years of active service in the department.

Shore's research spanned vast areas of the periodic table but he is probably best known for his pioneering work on boron hydrides, metal carbonyl clusters, and lanthanide/transition-metal systems and their conversion to catalytically active nanoparticles. He and his co-workers developed the first rational syntheses of B_4–B_{10} boron hydrides by a counterintuitive approach involving hydride abstraction by Lewis acids.

Together with his PhD supervisor Robert Parry, he published a seminal paper "The Crystalline Compound Ammonia–Borane, H_3NBH_3" (*J. Am. Chem. Soc.* **1955**, *77*, 6804–6705). This simple compound had been considered anomalous since the addition of borane to ammonia gave a species whose molecular weight in liquid ammonia corresponded to the formula $B_2H_6{\cdot}2\,NH_3$. Shore and Parry showed that H_3NBH_3 could be readily prepared from lithium borohydride and ammonium chloride in diethyl ether [Eq. (1)]. Furthermore, molecular weight determinations indicated that this crystalline compound was a monomer.

$$LiBH_4 + NH_4Cl \rightarrow LiCl + H_3NBH_3 + H_2 \quad (1)$$

Today, there is renewed interest in this compound as a hydrogen storage molecule, since upon heating it gives up molecular hydrogen with the ultimate formation of boron nitride [Eq. (2)].

$$H_3NBH_3 \rightarrow BN + 3\,H_2 \quad (2)$$

Given its molecular weight of 31 Da, the liberation of three equivalents of H_2 makes ammonia–borane a very attractive source of hydrogen for certain applications in the field, and this renewed Shore's research activity in this area during the past decade. In 2012, he published the crystal and molecular structure of $NH_3BH_2NH_2BH_3$, an analogue of *n*-butane (*Chem. Commun.* **2012**, 7943–7945), and he produced the first well-defined examples of tubular structures for boron nitride.

In the 1970s and 1980s, he worked extensively on metal carbonyl clusters, and on hydride metal carbonylates. His mechanistic studies of the syntheses of the metal carbonylates and the water-gas shift reaction attracted considerable attention. His interests in metal carbonylates led him into the area of lanthanide/transition-metal carbonyl complexes, their bonding, structures, and conversion to nanoparticles for heterogeneous catalysis. In an extensive collaboration with Universal Oil Products, they evaluated the potential of a variety of Group 8 and noble metal lanthanide nanoparticles for industrially important reactions, such as propane dehydrogenation to propylene, and several selective hydrogenation reactions, including the conversion of methylacetylene to propene and the conversion of phenol to cyclohexanone. In addition, he investigated the dehydrochlorination of chlorobenzenes. While no direct commercialization resulted from these collaborations, they did add considerable insight into the role of noble-metal/lanthanide bimetallic catalysis.

He is the author of over 300 publications and 14 patents. He received numerous awards, both from within and without the university. Amongst the most notable of these were the American Chemical Society's National Award in Inorganic Chemistry in 2007 and his election as Corresponding Member of the Bavarian Academy of Sciences.

Shore was a remarkable mentor and teacher and 91 students completed their MS or PhD degrees with him, in addition to the numerous postdoctoral and visiting scientists who spent time in his laboratory. He was totally involved in his laboratory and was a capable glassblower. Many of his students considered it a privilege to have spent "late nights with Super Sheldon" in the lab. He had many talents and certain eccentricities. He was an excellent pianist and even had a small piano in his office. His office was uncommonly untidy, being host to numerous piles of reprints and literature articles. Indeed, his office was once cited as a fire hazard in a safety inspection. He was an active pilot for many years and was known as the "Red Boron". He never married but was affectionately cared for by women that surrounded him, and his cats, to whom he was truly devoted. He was remarkably quick-witted and his humor was often self-deprecating. Dr. Sheldon Shore would become Dr. Seldom Sure and he claimed to be a living example of quantum tunneling: He said he was on the way down having never reached the top.

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