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**P. W. Bridgman's Contributions to the Foundations of Shock Physics** W.J. NELLIS, Harvard University — Based on his 50-year career in static high pressure, P. W. Bridgman (PWB) is the father of high-pressure physics. What is not generally recognized is that Bridgman was also intimately connected with the foundations of shock compression as a scientific tool and he predicted major events in shock research that occurred up to 40 years after his death. In 1956 a phase transition in shocked Fe was reported at 13 GPa. PWB said a phase transition could not occur in a microsecond, thus setting off a controversy. The scientific legitimacy of shock compression resulted 5 years later when static-pressure researchers confirmed with x-ray diffraction the existence of a high-pressure Fe phase. PWB gave Altshuler the idea of using nuclear explosives to generate super high pressures, which morphed into giant lasers. PWB anticipated combining static and shock methods, which day is done with with diamond anvil cell/laser. One variation of that pre-compression method is a reverberating shock in which the first shock "pre-compresses" a soft sample and subsequent reverberations compress it isentropically.

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