Preface

The 1950s and 1960s are sometimes referred to as the "Golden Age of Shock Wave Physics," characterized by ample private and government funding and with new insights and discoveries arriving on a regular basis. . . an exciting period, indeed.

After a period of relative quiet during the 1970s, shock wave research resumed its expansion in the 1980s, with substantial support shown for the science worldwide. To some degree, however, the emphasis had changed from basic to applied studies. While numerous studies of a basic nature were still being pursued, the application of shock wave research to practical matters such as spacecraft shielding, fragmentation of spacecraft by explosions and by impact with space debris, and the development of advanced kinetic energy weapons, has provided a major support for the research efforts.

Perhaps the most significant advance during this period was in the incorporation of physical models of shock wave behavior into finite difference and finite element routines, run both on supercomputers and on desktop personal computers. The capabilities of these routines to provide three-dimensional representations of complex target and projectile geometries have produced quantitative answers in areas previously not studied. Support for these computer techniques and the models they employ has grown in proportion to their utility.

New launchers and diagnostics have become available to the experimenter, substantially expanding measurement capability. Nanograms are launched at 100 km/s by Van de Graaff generators, milligrams are launched at 15–30 km/s by exploding foils and by laser acceleration, and grams are launched at 10–13 km/s by three-stage guns. As with their predecessors at lower velocities, new insights will be obtained into material behavior, pushing back the frontiers.