At a meeting of the FACULTY OF ARTS AND SCIENCES on December 12, 2000, the following tribute to the life and service of the late Bernard Budiansky was spread upon the permanent records of the Faculty.

BERNARD BUDIANSKY

BORN: March 8, 1925
DIED: January 23, 1999

Bernard Budiansky was an unabashed enthusiast about his profession, family, friends, and many other good things in life. He made innovative contributions to nearly every subfield of solid mechanics — the science of how materials and structures stretch, shake, buckle, and break. His work as an applied mathematician and mechanical engineer strongly influenced structural engineering and materials technology, and even seismology and biomechanics. He died from cancer at 73 years on 23 January 1999.

Bernie was born in New York on 8 March 1925 to Russian immigrant parents who soon separated, and was raised by his mother and grandfather. He obtained a Bachelor of Civil Engineering degree from CCNY in 1944 when he was barely over 19, a remarkable fact which, characteristically, none of us ever recall his mentioning.

He was a child of the heroic era of large engineering structures, and his love of structural mechanics was to be lifelong. But while at CCNY he became equally enamored with mathematics and physics, and could not fail to be attracted by the then-new challenges of aeronautical structural mechanics. Accordingly, he jumped at a first job offer as an aeronautical research scientist with a newly formed unit of the National Advisory Committee for Aeronautics (NACA, forerunner to NASA) at Langley, Virginia, concerned with high speed flight.

Although Bernie departed New York at a tender age, the imprint on him was indelible. His love for the city, its cultural references, its humorists (Henny Youngman, especially), and its lifestyle was to stay an integral part of him, along with an abiding pride in his generation at CCNY.

The NACA years began his rapid rise to eminence, with new understanding of the dynamics of elastic plates, shells, and their combination in various thin-walled structures essential for aviation. His work there, and later at Harvard, addressed failures by buckling, especially the strong sensitivity to small initial imperfections, the mathematical foundations of elastic shell

theory, and the vexing problem of flutter of airplane wings.

He took an educational leave from NACA to enroll in 1947 in the newly established graduate program in Applied Mathematics at Brown University; but he lingered no longer there than at CCNY, completing his Ph.D. in 1950. (Years later when Brown established a Graduate Citation to recognize distinguished graduate alumni, Bernie was the first recipient.)

Bernie returned to Langley in 1950 and, in 1952, was appointed Head of the Structural Mechanics Branch. That year was far more memorable because he married the charming, erudite, and mathematically trained Nancy Cromer, a South Carolinian who worked in the group assisting with computations at NACA. They made for an enduringly warm and wonderful couple, deeply interested in literature and the arts, in politics, travel and good food, and with Nancy being a cheerful participant in Bernie's love of horse races.

He came to Harvard in 1955 as a tenured Associate Professor in the Division of Engineering and Applied Physics (now DEAS). Bernie's renowned wit and clarity quickly established him as one of the finest teachers in the Division, even if his forcefulness and passionate expressions of opinion were found a bit intimidating by those who had not yet discovered the underlying warmth. The acerbic nature of his wit, and perhaps growing impatience, did loom larger in his later years. He remained as fulfilled as ever with his lectures to graduate students, who knew of him already as a legend, but expressed frustration that the undergraduates just didn't seem to be getting his jokes any more. We wondered who might tell him that perhaps they were too terrified to laugh!

Bernie dedicated himself to building the mechanics program at Harvard. He helped recruit his NACA colleague, the late J. Lyell Sanders, and had a major role in recruiting the current tenured members of the group. Bernie's area of solid and structural mechanics at Harvard has been influential on the world stage well out of proportion to its size. A distinguished academic, when learning of his death, referred to that area as "the house that Bernie built," and nothing could be closer to the mark. Indeed, Bernie's dedication and charm made the entire Harvard mechanics group an unusually cohesive group of faculty members.

In addition to his seminal work in structural engineering fundamentals, he also made widely cited contributions on the way that fissures and joints in rocks affect the propagation of seismic waves, which has become a standard basis for inferring rock properties in the Earth, and contributed to understanding stressing and deformation in the inflation of the human lung. His work of the last 20 years was focused on problems in the domain of materials science, explaining mechanical properties of solids in terms of microscopic mechanisms. Bernie referred to this important area as "Micromechanics." He was one of its pioneers, and contributed to explanation of the fracture of ductile metals and the toughening of normally brittle ceramics and composite materials.

Appropriately, Bernie was elected to the National Academies, of Science in 1973 and Engineering in 1976, and as a Foreign Member of the Royal Netherlands Academy. He won the highest scientific awards for achievement in mechanics, namely the Timoshenko Medal of the American Society of Mechanical Engineers (ASME) and the von Kármán Medal of the American Society of Civil Engineers, and won the ASME Medal recognizing "eminently distinguished engineering achievement." He received honorary doctor of science degrees from Northwestern and the Technion at Haifa. He served for many years on NASA advisory committees on aircraft structures and space technology, including during the time of the Apollo moon landing.

Bernie was a wonderful and valued colleague and friend, funny, acerbic and kind, a great original whose likes we can hardly expect to see again. He delighted in sharing his enthusiasm for current literature, good food and other pleasures with graciousness and charm. Intellectually, and as a scientist, he was still in his prime when fate took him at 73. He is survived by Nancy and their children Michael and Stephen.

Respectfully submitted,

Frederick H. Abernathy
Henry Ehrenreich
John W. Hutchinson
Richard J. O'Connell
James R. Rice, Chair