

Professor Robert Wellesley Mann
receives the
James R. Killian Jr. Faculty Achievement Award of the
Massachusetts Institute of Technology for the year 1983-84

Awarded at the Faculty Meeting of May 18, 1983

The Killian Faculty Achievement Award for 1983-84 "to recognize extraordinary professional accomplishments by full-time members of the MIT faculty", is given to Robert W. Mann, Whitaker Professor of Biomedical Engineering, in the Department of Mechanical Engineering.

Robert Mann's whole person and career stand for excellence in engineering design. It is a subtle synthesis that leads to real, working, and needed engineering devices, a synthesis that is based on analysis and understanding, but goes beyond to judgement, to a sense of values, and to sustained leadership. Those are what Robert Mann has brought to his work at MIT, work known world-wide for two decades, and recognized by consultancies, editorships, chairmanships, and awards too numerous to list. His contribution to engineering education at MIT goes back to the late fifties; it was he who pioneered in the direct involvement of engineering students in design by the development of design and project laboratories, now fixtures here and standard around the world. His own original design work led from early standard designs of the internal power supplies of surface-to-air missiles--schemes in use today after a generation--to a wide involvement in a new and exciting branch of engineering, one indicated by the two great practical arts touched by science, a fusion of engineering with medicine. He has led in the establishment of this exacting, practical and compassionate field, joining in his own design efforts the three distinct branches of information, mechanism, and materials, all put to the task of providing the powerful aid of modern engineering to human beings in need. In this task he has acquired the admiration and devotion of two whole expert communities, a fact that came clearer and clearer as this committee sought opinions about Robert Mann and his work.

Robert Mann is an MIT engineer, through and through. He was born in Brooklyn in 1924; he graduated from Brooklyn Technical High School, to take his first job at eighteen at a drafting board in the Bell Telephone Laboratories. He served three years with the U.S. Army Signal Corps, to come back from the Western Pacific to take up his old job on West Street. In 1947 he entered MIT, one of the mature GI undergraduates of those stirring years. By 1950 he had earned the S.B. with honors in Mechanical Engineering, by 1951 the S.M., and by 1957, the Sc.D., all from the same MIT Department. He became Assistant Professor of Mechanical Engineering at MIT in 1953, and was promoted to Associate Professor in 1958, to Professor in 1963, to become Germeshausen Professor in 1970, Professor of Engineering in 1974, and in 1974 to assume his present chair.

We list a few concrete examples of his wide-ranging design interests and inventive accomplishments over the last twenty years. He turned his design abilities first to sensory aids for the blind. During the early sixties he developed a computer-controlled system for fast printing in braille, a practical braille typewriter, a telephone switchboard augmented by braille symbols for operation by the blind, and a series of ultrasonic aids for moving around without the use of sight. He turned then to the mechanical

problems of the amputee, and led fundamental work in the development of a sophisticated upper-arm prosthesis controllable by the user's own nervous impulses. The two prototypes, the Boston Arm and the Utah Arm, were widely admired. Since then he has studied the structural problems of the knee and the hip by calculation, modelling, and ingenious measurements, in the interest of surgery, rehabilitation and advanced prosthesis. He and his students of design developed a variety of electromechanical toys able to help improve the abilities of disabled children. Most recently he has turned his attention to biomaterials; he teaches not only biomechanics and sensory physiology, but for years he was director of a program uniting a couple of dozen Boston research workers in diverse fields in the study of living materials as engineering components and of their possible surrogates. Out of that effort ongoing research of wide applicability has come. He is currently Director of the Newman Laboratory for Biomechanics and Human Rehabilitation at MIT, and co-director of the Rehabilitation Engineering Center of the Division of Health Science and Technology.

He has in fact been one of the pioneers of an entire new profession. Awards and honors have flowed his way from many sources; here we mention only the Gold Medal of the American Society of Mechanical Engineers, given him in 1977, and the New England Engineering Society Award of 1979.

It would be wrong to end on so solemn a note; this man is too warmly admired by his colleagues to leave it that way. Perhaps we could recall that he was elected President of MIT Student Government way back then in 1949, that he won the Bronze Beaver of the MIT Alumni in 1975, that he is a private pilot, a gardener, and a sailor. He has accepted over the years quite a few responsibilities from the selectmen, the schools, and the church community of his town, Lexington. His list of publications runs close to two hundred papers, with a number of patents.

Margaret Florencourt Mann was a Radcliffe physics undergraduate and has an advanced degree from Harvard Divinity School; the family educational balance is maintained by Robert W. Mann, Jr. with two MIT engineering degrees, in 1975 and 1977, and Catherine L. Mann, whose Harvard degree was won in 1977. Those who enjoy competition with our ancient Cambridge neighbor will be pleased to learn that Catherine is now a graduate student at MIT, in Economics.

The Committee for the Killian Award concludes its work in admiration and pleasure.

Philip Morrison, Chairman
Mildred S. Dresselhaus
Paul A. Samuelson
Nevin S. Scrimshaw
Eugene B. Skolnikoff