



## **Professor James Norman Goodier (1905 – 1969)**

See:

[https://en.wikipedia.org/wiki/James\\_N.\\_Goodier](https://en.wikipedia.org/wiki/James_N._Goodier)

Applied Mechanics  
Stanford University

### **Biography from Wikipedia:**

James Norman Goodier (October 17, 1905 – November 5, 1969) was professor of applied mechanics at Stanford University known for his work in elasticity and plastic deformation.

He was born in Preston, Lancashire, England and studied engineering at Cambridge University. He was awarded a Commonwealth Fund Fellowship which enabled him to continue his studies at the University of Michigan where he earned his doctorate in 1931 under the direction of Stephen Timoshenko with a dissertation titled Compression of Rectangular Blocks, and the Bending of Beams by Nonlinear Distributions of Bending Forces. Timoshenko moved to Stanford University in 1936 and Goodier eventually succeeded him there. He was co-author of two classic books in this field: "Theory of Elasticity," with Timoshenko, 1951; and "Elasticity and Plasticity," with P. G. Hodge, Jr., 1958 and was awarded the Timoshenko Medal by the American Society of Mechanical Engineers in 1961. He was chairman of the Applied Mechanics Division of the American Society of Mechanical Engineers 1945-46, and was elected Fellow of that Society in 1964. He had more than fifty doctoral students, one of whom was George F. Carrier.

**Memorial Resolution, Stanford University by Erastus H. Lee, Miklos Hetenyi and Harold C. Schmidt:**

Norman Goodier died on Wednesday, November 5, 1969 after a brief illness. He was born on October 17, 1905, in Preston, Lancashire, England where he attended municipal schools and won scholarships to study at Cambridge University. In 1927 he was awarded the B.A. degree with First Class Honours and also several University prizes, including the Rex Moir Prize as the most outstanding engineering student of his year. He continued his studies in Cambridge under the direction of Professor C. E. Inglis. He was awarded a Commonwealth Fund Fellowship, commonly regarded as the American answer to the Rhodes Scholarships, which, in 1929, took him to work with Professor S. P. Timoshenko at the University of Michigan. In 1931 he was awarded both the Ph.D. degree by Cambridge University and the Sc.D. by the University of Michigan. After a period of seven years as Research Fellow in Applied Mechanics at the Ontario Research Foundation, Toronto, he returned to academic life in 1938 as Professor of Applied Mechanics at Cornell University, where he was later appointed Head of that Department, and of the Department of Machine Design. While there he became a United States Citizen in 1946. He came to Stanford in 1947 as Professor of Applied Mechanics and Mechanical Engineering, which position he held throughout the rest of his life. During his tenure as Chairman of the Division of Engineering Mechanics from 1954 until 1965, he built up at Stanford a widely acclaimed group in applied mechanics.

Norman Goodier was an outstanding teacher. This attribute received national recognition early in his career when, in 1946, he was the first recipient of the George Westinghouse Award in Engineering Education. He was selected by the American Society of Engineering Education "for his work in broadening the scope of sound engineering instruction; for the skill with which he passes on to his students something of his own spirit of pioneering achievement and his high standards of excellence; and for the inspiration his efforts and his example have given to students and co-workers alike." This early promise was fulfilled at Stanford where he taught basic courses in applied mechanics, and also introduced to the curriculum new areas such as stress wave propagation and elastic and plastic instabilities which became extremely successful offerings. In his lectures he concentrated on concepts and explained them with great lucidity, so that his courses were always interesting and popular with students. His reputation was as a theoretician, and yet, largely through consulting activities, he had broad practical experience which often emerged in the classroom to further heighten the interest of his students. He guided the studies and research of more than fifty Ph.D. candidates. He insisted on seeing his research students once each week, even though no new research results may have emerged between sessions, and on such occasions he would talk about applied mechanics in general and take a personal interest in his student's development. He followed the professional progress of his former research students, continued to take a personal interest in them, and was always pleased to meet and talk with them again.

Norman Goodier has a world-wide reputation for his research contributions concerned with elasticity and elastic stability, thermal stresses, wave propagation in solids, the mechanics of crack propagation and dynamic elastic-plastic buckling. These have appeared in numerous research papers, and they received international recognition in 1961 through the award to him of the Timoshenko Medal by the American Society of Mechanical Engineers. This Medal is awarded to individuals, without restriction as to nationality or profession, in recognition of distinguished contributions to Applied Mechanics. Further honors bestowed on Norman Goodier were a Fulbright Award for research at Cambridge University 1955-56 and D. Eng., Honoris Causa, by his alma mater, the University of Michigan, in 1967. He was co-author of two books: "Theory of Elasticity," with S. Timoshenko, 1951; and "Elasticity and Plasticity," with P. G. Hodge, Jr., 1958. The former, now in its third edition, is considered by many to be the leading textbook in this field.

Norman Goodier was an active participant in national professional activities. He was Chairman of the Applied Mechanics Division of the American Society of Mechanical Engineers 1945-46, and was elected Fellow of that Society in 1964.

As a colleague and companion, Norman Goodier shared with us a rich heritage of music, art, poetry and

literature. In conversation he was never at a loss to reach deeply into his reservoir of reading material for some apt quotation which illustrated the problem of discussion at a particular moment. This skill in memory was always exhibited with the sensitivity of a person contributing to a better understanding of a given problem and never as ostentatious display of knowledge for its own sake. He possessed a wry sense of humor and a ready wit, conversation with him being frequently enlightened with an apt anecdote. He was an avid reader and his interests in literature led him into various aspects of contemporary religious thinking as well as general theology. His library of books always contained an "in depth" volume on a given subject. There was never the feeling that he skimmed the surface of a subject. Norman Goodier shunned anything which bordered upon the superficial or in any way suggested the casual "dilettante." His curiosity perpetually sought to explain those problems which have confronted the mature thinking man. As a lover of music he enjoyed concerts and possessed an uncommon knowledge of the history of music literature. His ability to play the piano led him into an exploration of the music of Bach, Beethoven, and Brahms, and some of the more conservative 20th century composers. Norman Goodier was sensitive to the problem of human relations in and out of the classroom. He was sympathetic to student and colleague personal problems and discussed them with a detachment often philosophical but helpful to the individual concerned.

In 1931 he married Marina Timoshenko, daughter of Professor Timoshenko, who survives him, as do their son, Peter, and his two daughters.

From a personal point of view, Norman Goodier was a shy man, gentle, non-aggressive, soft-spoken, considerate of others, and, above all, a dedicated man in the company of university scholars.

#### **Selected Publications:**

J. N. Goodier, Concentration of stress around spherical and cylindrical inclusions and flaws, *Trans. ASME*, 55 (1933) 39–44.

Timoshenko, S., Goodier, J. N. *Theory of Elasticity*, 2nd Edition, New York: Mc Graw Hill, 1951

Goodier, J. N., Hoff, N. J. eds. (1960) *Structural Mechanics*, Proceedings of the First Symposium on Naval Structural Mechanics. Pergamon Press, Great Britain

Goodier, J. N. and I. K. McIvor. "The elastic cylindrical shells under nearly uniform radial impulse", *J. Appl. Mech.*, Vol. 31, No. 2, June 1964

Abrahamson GR, Goodier JN. "Dynamic flexural buckling of rods within an axial plastic compression wave". *J Appl Mech* 1966; 33:241–7.

J.N. Goodier. Dynamic plastic buckling, In: *Proceedings of the Int Conf on Dynamic Stability of Structures*, Ed. G. Herrmann, Pergamon, New York, 189–211, 1967.

Goodier JN. "Dynamic buckling of rectangular plates and sustained plastic compressive flow". In: *Engineering plasticity*. Cambridge: Cambridge University Press; 1968. p. 183–200 *Proceedings of an international conference of plasticity*, Cambridge, England, March 1968.

Florence AL, Goodier JN. Dynamic plastic buckling of cylindrical shells in sustained axial compressive flow. *J Appl Mech* 1968;35(1):80–6.