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Sawczuk, Antoni



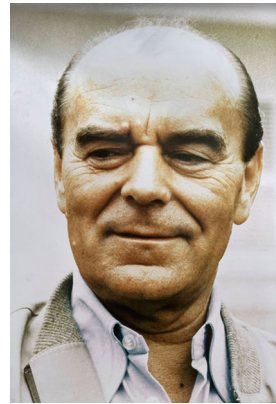
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Antoni Sawczuk (* January 27, 1927, in Komarno near Biała Podlaska, Poland; † May 27, 1984, in Grenoble, France, buried in Warsaw, Poland) was a civil engineer, professor of structural mechanics and mechanics of continuous media. Cofounder of the Polish school of plasticity theory. He made substantial contributions to the limit analysis and postyield behavior of plates and shells, shakedown of plastic structures as well as anisotropic hardening models and continuum damage mechanics using the theory of tensor function representations.

Education

Antoni Sawczuk attended the Hugo Kołłątaj Gymnasium in Warsaw, which he graduated in 1947. He studied civil engineering at the Warsaw University of Technology and received his master's degree in 1951. He obtained his doctor degree in 1958 on the basis of an unpublished thesis "Theory of limit analysis of plates and its technical applications," written under the supervision of Waław Olszak at the Faculty of



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Civil and Industrial Engineering of the Warsaw University of Technology. After obtaining his PhD degree, he went to the United States on a 1-year research scholarship, where he worked on problems of plasticity with Philip G. Hodge Jr. at the Illinois Institute of Technology in Chicago and with William Prager at Brown University in Providence. Upon returning to Poland, he habilitated at the Warsaw University of Technology in 1960 with a dissertation entitled "Linear theory of plastically anisotropic shells."

Professional Career

After completing his university education, Antoni Sawczuk worked as an engineer in the Granary and Mill Design Office. At the same time,

he started his academic career at the Warsaw University of Technology, first as an assistant (1951–1952), later as assistant professor (1952–1960), and associate professor (1961) at the Chair of Strength of Materials of the Faculty of Civil and Industrial Engineering. In parallel, he was working part-time at the Institute of Fundamental Technological Research of the Polish Academy of Sciences (IPPT PAN) in Warsaw as an assistant professor (1956–1960). Since 1961, and for the rest of his professional life in Poland, he was affiliated with the IPPT PAN, first as Head of the research group on engineering applications of plasticity theory (1960–1969) and then as head of two departments—Department of Mechanics of Solids and Department of Theory of Structures (1969–1982). In 1982, Antoni Sawczuk was elected Rector of the International Center of Mechanical Sciences (CISM), Udine, Italy, and held this position until his untimely passing away in 1984. He was visiting professor at the Illinois Institute of Technology (1964–1965), University of Grenoble (1966–1968 and 1976–1977), Nagoya University (1975), University of Poitiers (1978), and University Aix-Marseille (1982–1983).

Scientific Achievements and Distinctions

Antoni Sawczuk's research was devoted both to structural mechanics and continuum mechanics. He applied the theory of plasticity to various problems in engineering structures, including the limit analysis of plates and shells and the shakedown behavior of elastoplastic structures, with a particular focus on plastic anisotropy. In the field of continuum mechanics, his contributions included a hardening rule accounting for anisotropy produced by plastic deformations, the application of the theory of tensor function representations to constitutive relations for solids with oriented structure, and continuum damage mechanics. Also,

Sawczuk was among the first to use computer tomography to evaluate damage in plastically deformed solids. He has published more than 160 scientific papers, including several monographs on inelastic behavior of structures, e.g., Sawczuk and Jäger (1963) and Olszak and Sawczuk (1967), which became reference positions in the technical literature. He served as a member of editorial boards of several scientific journals, such as the *Journal of Structural Mechanics*, *Nuclear Engineering and Design*, *Computer Methods in Applied Mechanics and Engineering*, *International Journal of Mechanical Sciences*, *Journal de Mécanique Théorique et Appliquée*, *Archives of Mechanics*, and *Zeitschrift für Angewandte Mathematik und Mechanik*.

Antoni Sawczuk was elected as a Corresponding Member of the Polish Academy of Sciences in 1969 and became a Full Member of the Academy in 1983. He received *Honoris Causa* Doctorate from the Institut National Polytechnique de Grenoble (1978). As a leading representative of Polish mechanics, he was a member of many international associations including International Union of Theoretical and Applied Mechanics (IUTAM), RILEM (Réunion Internationale des Laboratoires d'Essais et de Recherches sur les Matériaux des Constructions), CEB (Comité Européen du Béton), and IASS (International Association for Shell and Spatial Structures).

Cross-References

► [Prager, William](#)

References

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- Sawczuk A, Jäger T (1963) *Grenztragfähigkeits-Theorie der Platten*. Springer, Berlin