

IN MEMORIAM

WOLFGANG ZERNA

Founding Member and Honorary Member of the IASS



On November 14, 2005 after a short illness, Professor Emeritus Dr.-Ing. habil. Dr.-Ing. E.h. mult. Wolfgang Zerna, a founding member and honorary member of the IASS, passed away, one month after completion of his 89th year.

With his death, the international engineering community has lost an exceptional engineering scientist, a gifted engineer, and an engaged representative of our profession. At the beginning of his professional career, Zerna's love was the challenge of theoretical mechanics, but his main achievements are important contributions to the progress of reinforced and prestressed concrete structures. There he developed prestressing systems, applied this new construction tool to the design of large structures in post-war Germany, and extended it to a new application in the field of nuclear power constructions. In the early epochs of computer applications he was one of the initiators of the field of computational structural engineering.

His early international scientific engagement opened the gates to young German scientists, after the catastrophe of the Second World War. His early engagement in European technical standards for reinforced concrete structures knit ties to neighboring countries, bringing their thoughts back into German civil engineering.

Wolfgang Zerna was born in 1916 in Berlin and received his education there. Before being drafted to the army in 1940, he finished his studies in civil engineering at the Technical University of Berlin with the diploma. His teachers there, Dischinger, Schleicher, Agatz and Tölke, all internationally recognized scientists, impressed the young Zerna and influenced his later career that combined structural mechanics and structural engineering.

After four years of service in both the war and as a prisoner-of-war in the US, Zerna returned to Germany in 1947 and became teaching assistant in structural mechanics to A. Pflüger at the Technical University of Hanover. There in the same year, he was awarded the title of Doctor of Engineering with a thesis entitled "Membrane Theory of General Shells of Revolution." Only one year later in 1948, he finished his habilitation thesis with a basic work on the mathematical foundations of elasto-statics.

In 1949 he became a visiting research associate at the Department of Mathematics at the British University of Durham. There in collaboration with A. E. Green he started to write the monograph *Theoretical Elasticity*, which appeared in 1954 and soon became recognized worldwide as a source for researchers in continuum mechanics. As a continuation of his habilitation thesis, Zerna incorporated in this monograph a tensor-based theory of thin shells, which was highly innovative and made him world-famous at a very young age.

After returning from Britain, Zerna started his professional career as civil engineer in the German construction industries, first at Polensky und Zöllner GmbH in Cologne, then at Ph. Holzmann AG in Frankfurt. There he soon became responsible for development and progress of the Holzmann prestressing system, and all prestressed

reinforced construction projects of the entire company. During those early years of reconstruction of war-destroyed Germany, his design ideas influenced many large bridges and further important engineering structures.

In 1957 Zerna was appointed as Professor of Reinforced and Prestressed Concrete Structures at the Technical University of Hanover, where he started those scientific activities of modern structural engineering that made him known far over the German borders. Here he engaged himself in the foundation of electronic computational techniques in structural engineering and combined such early simulation concepts with electronically recorded structural measuring techniques. His institute in Hanover was the first engineering research center to be granted its own digital computer, a then-famous "Zuse Z 22," from the DFG, the German National Science Foundation. In those years in Hanover, Zerna and his team developed pioneering works in the construction of large natural-draft cooling towers and in the analysis of prestressed reinforced concrete containments for nuclear power plants. While engaged in the University of Hanover, he served as Department Chairman, as Dean of the Faculty of Architecture and Civil Engineering, and in many other University Committees. Moreover, he deepened his scientific interests and laid the foundation of his practical consulting activities.

After having been appointed in 1963 as a member of the Founding Senate of the newly established Ruhr-University in Bochum, in 1967 Zerna became the first professor of civil engineering at this university, the first in Germany to be located on a single new campus. In Bochum, Zerna continued with great enthusiasm his scientific research projects while teaching with his associates the new students. He structured a new Civil Engineering Department with many of the characteristics he knew from British Universities. In the community of the Institute of Structural Engineering he developed his team there towards a highly recognized engineering research center with combined theoretical, numerical, and experimental research projects. His scientific achievements in those days were honored by several honorary doctorates.

At the same time, he intensified his practical activities as an engineering consultant, as a proof

engineer, and as an author of scientific engineering publications. In Bochum he also started two successful consulting engineering offices, which today still flourish and will try to continue his work after his death. Wolfgang Zerna's charismatic personality, his natural intelligence, his creativity, and his convincing argumentation created a high effectiveness in all his co-workers. His magnificent personality and his wise tolerance opened creative spaces to each of his associates.

Zerna served during his long active life in a countless number of honorary appointments, such as Member of the Scientific Council to the Federal Government, Member of the Forum for the Advancement of Peaceful Use of Atomic Energies, Member of the board and Director of the of the VDI-Society of Civil Engineering (the German national civil engineering society). He was a founding member of the IASS and a member of the Academies of Science in two German States, the American Concrete Institute, and the German National Committee on RC Concrete. Among his honors, too numerous to list fully here, was his election in 1988 to Honorary Membership of the IASS in recognition not only of his outstanding accomplishments in the field of shell structures but also of his service both on the IASS Executive Council and in formative stages of IASS Working Group 3 on Reinforced Concrete Cooling Towers.

In 1983 at the age of 67, Zerna became Professor Emeritus of the Ruhr-University. Subsequently, he was active as an engineering consultant but retreated more and more in recent years to his home close to Hanover to spend the evening of his life there with his wife, Margit. There he passed away and was buried in small family circle.

For all colleagues and friends the passing away of Wolfgang Zerna is an irretrievable loss. He was to many of us a scientific father, an experienced engineer, and often the last advisor in complicated situations. All his friends in the IASS as well as in the Department of Civil Engineering at the Ruhr-University will keep Wolfgang Zerna in their hearts, and his personal values will remain a continuing obligation for us.

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