

## GÁBOR KAZINCZY

1889–1964



Gábor Kazinczy graduated in 1911 from the Technical University, Budapest as a civil engineer. He acted for almost 40 years as a research and practicing engineer.

On the basis of his tests, he introduced the concept of plastic hinges, and elaborated the fundamentals of the limit analysis of structures.

One of the papers to be presented is an excerpt from a paper to introduce the concept of plastic hinges. The other, text of a lecture from 1936, has been concerned with the critical evaluation of the plastic analysis of structures. Theoretical and experimental analyses have been spent on the problem of residual deformations.

Gábor Kazinczy was born in Szeged (Hungary), January 19, 1889. He studied at the Technical University, Budapest and graduated as a civil engineer in 1911. As a young engineer he entered municipal service mainly engaged in checking structural design of new constructions in Budapest. In 1931 he obtained the Doctor degree from the Technical University, Budapest. In 1939 he was appointed associate professor. He died in Sweden, May 26, 1964.

His scientific activity is of fundamental importance in the development of the plastic theory of structures.

In 1913 — in course of evaluating a load test — he made the significant observation that the load carrying capacity of a built-in rolled steel beam was not exhausted by reaching the yield moment at one cross section (Betonszemle, No. 4–5–6, 1914). He was of the view that as a result of the yield moment in the cross sections so-called plastic hinges developed. The load carrying capacity of the complete beam is not exhausted until it is not entirely transformed by

successively developing hinges to a chain of hinged bars. This realization and its explanation made Kazinczy the founder of a discipline, the limit analysis of structures.

Later Kazinczy extended his theory originally established for clamped beams to other hyperstatic structures. His research results were first submitted to the international professional publicity at a 1929 Congress in Vienna. Thereafter, and in particular, in compliance with his suggestions made at the 1930 Congress in Liège, scientists have got increasingly interested in the limit analysis of hyperstatic structures.

Another highly important result of his research was that the plastic analysis for reinforced concrete structures could also be extended. He reported his relevant test results first at the 1931 Congress in Paris, then in the review "Beton und Eisen" in 1933.

During World War I, he was engaged with safety problems but he did not publish his results earlier than 1929, at a Congress in Vienna. His studies on the analysis of circular cylindrical shells are also of interest. His last study offers a simple method for the analysis of reinforced concrete cross sections in skew bending. The number of his publications is 84, not counted the great many lectures delivered at Hungarian and international meetings. (The complete list of his publications appeared in *Acta Techn. Acad. Sci. Hung.* Vol. 53 (1966) pp. 455—460). His wide range of interests and abilities is seen from his concerns, in addition to theoretical and experimental analysis of structures, also in material testing, fire safety, labour safety, as well as in site management, technology and economy problems of constructions.

Gábor Kazinczy was one of Hungarian engineers endowing the engineering science with new findings in many fields. His experimental results provided real value to his theoretical statements. His outstanding activity has won him the respect of successors prompted to apply and to further develop his achievements in a manner worth his memory.

In the following, two details of the works of Gábor Kazinczy will be presented. One is an excerpt from a Hungarian paper published in the review *Betonszemle*, 1914. Particulars and numerical evaluation of the tests have been omitted, only a short outline of the tests, development of the concept of plastic hinges and determination of the actual load capacity of built-in beams will be reproduced.

The second paper is an English translation of parts of a German paper submitted at the 1936 Berlin Congress of the International Association for Bridge and Structural Engineering (Final Report, pp. 56—69. Berlin, 1938. W. Ernst und Sohn).

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