POLITICS, ESTHETICS, STATICS
FUNDAMENTAL PRINCIPLES OF A BEAUTIFUL BRIDGE ?

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ABSTRACT

The collaboration between engineers and architects, the search for effective static schemes, the development of technologies in both the numerical and the theoretical fields and the transfer to civil engineering of technologies well known in other sciences fields, could well be the future trends in our profession and especially about the evolution of the structural design…

Even if the bridges or the footbridges are only one facet of civil engineering, it is undoubtedly in this field that the variety of the structures is most significant and which emphasizes most easily the developments in the technology of construction. From the end of the 18th century, when steel bridges first began to be built, up to the second half of the 20th century, bridges have always been in the process of constant and rapid development. This development is due sometimes to the development of structural designs, sometimes to the development of new materials, sometimes to new technologies. But this development cannot be conceived without a thorough knowledge, at the same time, of the theoretical behaviour of structures and an overall approach of basic safety knowledge. Finally, the field of the civil engineering is closely dependent on the economy or in a more general way on the policy in the etymological sense of the term. The structure created must meet a functionality defined by the owner who has at his disposal a maximum allowable cost and who wishes to bring into service his structure within the shortest time.

If no one seems anxious to conquer new records for the height of a tower, the length of the span of a structure, the weight for a launched structure, the interest when designing a structure is certainly elsewhere:

- In the design of a structure which can be understood without using a computer program,
- In the design of a assemblage, simple to be built but which enables a natural transfer of forces,

In the multi-disciplinarity of the fields that the civil engineer seems to have to consider in order to go further in the analysis of the behaviour of structures.

Some recent bridges such as a classical steel box-girder bridge et Revin in the North of France, a steel cable-stayed bridge, in the North of Belgium, whose the main span is 600 m long with a very large curvature in the horizontal plane, a new tied arches bridge in the Netherlands, a arch bridge in Reunion Island will illustrate the ideas and the design concerning these fundamental principles.