

PIONEERS CANTILEVER CONCRETE SHELLS

Del Río, Gollo, Nervi, Torroja, Zuleta

PEPA CASSINELLO

*Director of Eduardo Torroja Foundation
c/ Serrano Galvache 4, Madrid 28033, Spain
p.cassinello.p@gmail.com, director@fundacioneduardotorroja.org

Abstract

On IASS 60th anniversary, this paper wants to contribute to remember a small relevant part of the large and fascinating history that motivated its foundation in 1959 [1] [2].

Thin reinforced concrete shells are among the most admired milestones of international Modernist history. The second decade of the twentieth century witnessed the beginning of what might be termed the ‘*Concrete Shells Adventure*’, in which engineers and architects joined forces, bound like links in the same chain forged in pursuit of the most *effective, naked and slender structural form*. They strove to conquer the new freedom of shape and size afforded by reinforced concrete, very much in keeping with the new outlook that gave rise to Modernism in that same decade.

Undoubtedly the greatest feats were the large and slender concrete shells as well as those built in cantilever. Really the shells that fly over the space, not only have a great difficulty of design but also a special and disturbing attractive.

We are going to remember a few pioneers cantilever concrete shells of some outstanding contributions to the sequential and prolific chain of developments that took place simultaneously in different countries. This paper analyzes the contributions of some of them built in stadiums (football or hippodromes) as they are; The Royal Turf Club in Bangkok, Thailand, by Emilio Giovanni Gollo (1922), a set of cylindrical hanged concrete shells. The Florence Football Stadium (1929-1932) by Pier Luigi Nervi [3], whose grandstand roof consists in 24 concrete curved ribs and vaults made by ceramic materials. The Stadium Buenavista in Oviedo (1930-1932) by Ildefonso Sánchez del Río, which was built with cantilevered flat beams [4]. The Zarzuela Racecourse in Madrid, Spain, by Eduardo Torroja (1933-1935), a continuous cantilevered concrete shell with a geometry perceptibly close to a hyperboloid [5]. The Colombian Baseball Temple in Cartagena de Indias by Guillermo González Zuleta (1947), a cantilevered concrete shell which was lightened by the inclusion of small ceramic pieces.

These master pioneers used different cantilevered structural forms and that together constitute an unforgettable lesson from the past in which their ability to innovate is intimately linked to their structural and construction knowledge, as well as their special creative intuition.

References

- [1] J. F. Abel, Félix Candela and the IASS. Article in book “*Félix Candela Centenario- Centenary*”, Universidad Politécnica de Madrid, Spain 2010, p.p 143-147
- [2] D.P. Billington: “The founding of the IASS. Eduardo Torroja and the context until 1959”. “Fifty years of Progress for Shell and Spatial Structures, IASS 50th Anniversary Jubilee Book, Mogan I., and Abel J.F. (eds) 2010.
- [3] T. Iori, “*Pier Luigi Nervi*”, Motta Architettura, Milan, Italy 2009, p.p 34-37
- [4] P. Cassinello, “*Ildefonso Sánchez del Río*”, Fundación Juanelo Turriano, Madrid, Spain 2011
- [5] P. Cassinello, “*Eduardo Torroja Museum*”, Fundación Eduardo Torroja, Madrid, Spain 2016