

# Publishing particulars of paper under discussion

## Vol 55 (3) 2013, Pages 96–102, Paper 841: Structurally efficient housing incorporating natural forms

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### COMMENT

The above-mentioned paper deals with the catenary shape to structural forms to obviate tensile and bending stresses.

The authors make the following statement on page 98: *"Unfortunately, the practice of implementing natural forms seems to have faded in the early 1900s – an incomprehensible digression in structural design."*

This statement is incorrect!

In the 1950s Mr R I D M Myburgh, then in charge of the Design Division of the Department of Water Affairs, designed multiple-dome dams on the same principles. He loaded a steel-wire mesh model of the structure with weights representing the forces on the dam – own weight and water load. The mesh model took on a shape, which, when reversed, would be wholly in compression. This shape was measured and expressed as

quadratic equations of a series of horizontal ellipses, which were then used in setting out the structure. A vertical section through the centre of the arch is parabolic. Three dams of those shapes were successfully completed – the Wagendrift Dam on the Bushmans River, the Stompdrift Dam on the Olifants River near Oudtshoorn and the Kat River Dam on the river of that name in the Eastern Cape. I was privileged to have been on the construction of the Stompdrift Dam, consisting of three domes, supported by buttresses. These concrete domes are extremely thin, illustrating the economy of materials! All three dams have now successfully been in service for about fifty years!

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## DISCUSSION

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