

**NEW APPROACHES TO STRUCTURAL MECHANICS,
SHELLS AND BIOLOGICAL STRUCTURES**

Edited by H.R Drew and S. Pellegrino

CONTENTS

Foreword	ix
-----------------------	----

CALLADINE'S CONTRIBUTION

Calladine, C.R.

Some Thoughts on Research	1
---------------------------------	---

Publications by C.R. Calladine	11
---	----

STRUCTURAL MECHANICS

Abbassian, F., Willson, S. and Crook, A.J.L.

Collapse Behavior of Expandable Slotted Tubes	23
---	----

Augusti, G., Mariano, P.M. and Stazi, F.L.

Laws of Evolution of Cracks in Plates in Terms of Stress Resultants	43
---	----

Cocks, A.C.F.

Nesting Surfaces and Constitutive Laws for the Inelastic Behaviour of Composite Materials	57
--	----

Como, M.

On the Rotation Capacity of Reinforced Concrete Structural Elements	67
--	----

Fleck, N.A., Ashby, M.F. and Deshpande, V.S.

The Topology of Cellular Structures	81
---	----

Fowler, P.W. and Guest, S.D.

Symmetry Analysis of the Double Banana and Related Statically Indeterminate Structures	91
---	----

Greenwood, J.A.

Large Deflections of a Cantilever	101
---	-----

Heyman, J.

Rose Windows	115
--------------------	-----

Leckie, F.A.

Joining of Metal Matrix Composites	127
--	-----

Liddell, I.

Utilising Tension in Lightweight Structures 139

Livesley, R.K.

Elastic Minimum-Weight Design: an Encounter with Alan Turing . 155

Lowe, P.G.

Engineering and Education 165

Mandal, P.

Prediction of Buckling Load from Vibration Measurements 175

Pavlović, M.N., Tahan, N. and Kotsovos, M.D.

Non-Collinearly Loaded Laminae 189

Ponter, A.R.S. and Chen, H.

Linear Matching Methods for Shakedown Analysis 203

Seffen, K.A.

Analysis of Coiled Piezoelectric Structures 215

Stronge, W.J.

Frictional Impact in Mechanisms 229

Tarnai, T. and Szabó, J.

Rigidity and Stability of Prestressed Infinitesimal Mechanisms 245

Wong, Y.W. and Pellegrino S.

Amplitude of Wrinkles in Thin Membranes 257

SHELL STRUCTURES**Arbocz, J. and Starnes, J.H.**On a High-Fidelity Hierarchical Approach
to Buckling Load Calculations 271**Fay, J.P., Puria, S. and Steele, C.R.**

Cat Eardrum Response Mechanics 293

Harrigan, J.J. and Reid, S.R.

Inversion of Metal Cylinders 303

Holst, J.M.F.G., Rotter, J.M., Gillie, M. and Münch M.

Failure Criteria for Shells on Local Brackets 315

Miura, K.	
PCCP Shells	329
Palmer, A.	
Pogorelov's Theory of Creases, and Point Loads on Thin Cylindrical Shells	341
Rotter, J.M.	
Shell Buckling and Collapse Analysis for Structural Design	355
Shrivastava, S.C.	
Bifurcation Buckling of Spherical Sandwich Shells under External Pressure in Plastic Range	379
Singer, J., Abramovich, H. and Weller, T.	
The Prerequisites for an Advanced Design Methodology in Shells Prone to Buckling	393

BIOLOGICAL STRUCTURES

Klug, A.	
Chris Calladine and Biological Structures: A Personal Account ...	413
Drew, H.R.	
Calladine's Entry to the World of DNA	421
Hotani, H., Nomura, F., Takeda, S., Inaba, T., Takiguchi, K., Itoh, T.J. and Ishijima, A.	
Morphological and Topological Transformation of Liposomes	435
Hunter, C.A. and Packer, M.J.	
Computational Approaches to Predicting Sequence-Structure Relationships in DNA	447
Luisi, B.F.	
Understanding Biological Machines Using Household Items: Some Insightful Constructions from the Calladine Workshop	457
Lutter, L.C., Tchernaenko, V., Radlinska, M., Drabik, C.E., Bujnicki, J. and Halvorson, H.R.	
Measurement of DNA Bend Angles Using DNA Topology	475
Namba, K.	
Structural Insight into the Mechanism of Supercoiling of the Bacterial Flagellar Filament	485

Stewart, M. and McLachlan, A.D.	
Coils and Supercoils in Proteins	499
Thompson, J.M.T.	
Supercoiling of DNA Molecules	513
Author Index	525