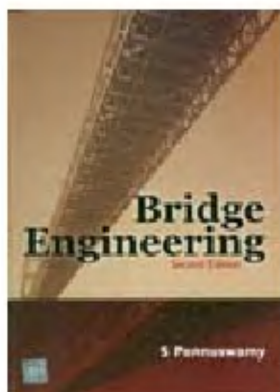


was shown that the amount of baryons detected at low redshift only makes up one-tenth of the total number of baryons at high redshift. It has been posited that these missing baryons might lie in the filamentary structures connecting virialized groups and clusters. Some of these have already been detected in the damped Lyman- α systems; however, there has been no convincing detection of hotter gas till date. The possibility that this hotter gas may be detected in the very near future makes this review timely.

In summary, I feel that this volume contains several interesting and competent articles that will be of interest to experts as well as those who are looking for material to learn about a field. For the latter audience, I might add that they will need to supplement these articles with other material, since most of these reviews are fairly concise and technical, and have been written mainly for an informed audience.

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Bridge Engineering. S. Ponnuswamy. Tata McGraw Hill Publishing Co Ltd, 7 West Patel Nagar, New Delhi 110 008. 2008. 747 pp. Price: Rs 750.

This book has come at the right time, when infrastructure development is the need of the hour presently, particularly because most of the urban centres have become hubs for industrial development. Infrastructure planning with emphasis on design of traffic network, although appar-

ently seems to be in the realm of common sense, has certainly a lot of physics. It may not be out of place to cite an article 'Physics is dead, long live physics' by Mark Buchanan (*Nature-Phys.*, 2008, 4, 159), wherein the author cites the work of two other physicists, James Lighthill and Gerald Whitham, who developed the first fluid model for traffic in 1955 in a paper entitled 'On kinematic waves: II. A theory of traffic flow on long crowded roads' (*Proc. R. Soc., Math. Phys. Sci.*). The intention of quoting the above is to emphasize the fact that transportation engineering, of which bridge engineering is a part, is not dead, although quite traditional in approach. The present book has brought out the scientific flavour inherent in all the aspects of bridge engineering, which is apparent in most of the chapters, and particularly in those dealing with superstructure – design aspects, construction, inspection and maintenance.

The book contains 23 chapters, which is rather too large a number. The introduction highlights the importance, appropriateness and relevance of the different types of bridges. Various types of bridges in India and abroad are illustrated. A brief history of the bridges is thought-provoking. Further, the author goes on to explain the various steps involved in bridge construction starting with pile selection, hydrological survey and design, soil investigation and choice of foundation. The author nicely takes the reader to an important aspect of bridge design, viz. choice of the type and loading standards. In the Preface to the first edition, the author has presented a table containing failures of bridges in the US due to various reasons. It is a useful piece of information.

The chapters on choice of foundation for piers and abutments, as well as on types of bridges and loading standards are useful to practising engineers. The information although well known, is explained lucidly with good commentary supported by sketches. Superstructure design which requires the knowledge of architecture and structural engineering, is always not easy. In my view, the book has really come in time to educate an engineer about both. Some of the case studies of bridges elsewhere, like the one on Mississippi River at Washington Avenue, are not available in other books.

The book looks quite complete in all aspects and I do not think that I can sug-

gest any other addition, except that the number of chapters could have been lesser by merging a few of them. For example, all foundations, viz. open, pile and well could have been in one chapter and similarly superstructure, construction, maintenance and inspection could have been in another chapter. Loading standards should have been a part of the superstructure, design and not part of types of bridges. A few inconsistencies in titles are observed. For example, in Chapter 9, the title is 'Open foundation', while in Chapter 10, it is 'Pile foundations' and again in Chapter 11, it reads 'Well foundations'. It could have been uniformly in plural tense. Some of the titles are too long like that of Chapter 8; the title looks like a complete sentence. Similarly, the title of Chapter 6 could have been better were it just 'Foundation for piers and abutment', because the theme of the chapter is simply not the 'choice', but more than that.

Notwithstanding the above few minor observations, the book is certainly useful when many new bridges, flyovers and grade separators are being added in all the urban centres. Infrastructure needs to be properly taken care of and many consultants in the business are involved. The book certainly can be recommended to be read by all these practitioners and will be a useful addition to the library in a university, research institution or R&D laboratory.

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Mild Stress and Healthy Ageing: Applying Hormesis in Ageing Research and Interventions. Eric Le Bourg and Suresh I. S. Rattan (eds). Springer Science. 2008. 187 pp. Price not mentioned.

As there is a rapid rise in the elderly population and incidence of related old-age diseases, the challenge is to maintain a healthy lifespan. In this context, the present book is timely, written by experts in the subject and presents state-of-the-art research on hormesis and ageing. Although the book is multi-authored, the

chapters are highly coordinated. It aims to explore whether hormesis can be used for healthy ageing of human beings and presents excellent and interesting information on hormesis with respect to ageing. The editors are leading researchers and popularly known for their longstanding contributions in the area of ageing and hormesis.

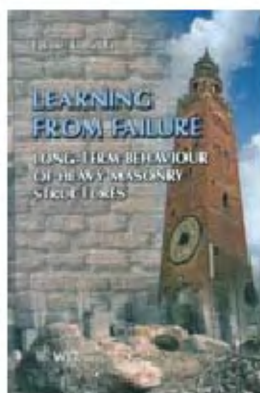
The book comprises ten well-written chapters covering a wide range of topics on hormesis and ageing. Each chapter is thoroughly discussed and provides new information. The first two chapters deal with detailed introduction of hormesis and ageing, the next five chapters discuss hormetic effects of various types of stresses, and the last three chapters are concerned with clinical applications of hormesis. The book concludes how hormesis can be useful for healthy ageing, though the underlying mechanism of action is not clearly understood.

The book begins with an excellent introduction and brief historical analysis of hormesis and ageing by the editors. The second chapter by Edward Calabrese, further explains the phenomenon of hormesis and focuses on its use in gerontological research. The third chapter written by Alexander Vaiserman, describes the beneficial effects of low-dose irradiation on the longevity of fruit flies, nematodes, rodents and human beings. The next chapter by Eric Le Bourg presents results of hormetic effects of hypergravity on ageing and longevity of *Drosophila melanogaster*. The following chapter by Jesper Sorensen and colleagues focuses on the use of extreme temperatures, either hot or cold, in *D. melanogaster*. The next chapter by the editor Suresh Rattan himself, describes the effects of mild stresses on human cells, mainly fibroblasts. Focusing on rodents and human beings, Li Li Ji shows that an increased physical activity can act as a mild stress with hormetic effects. The last three chapters are concerned with clinical applications of hormesis. Brian Morris discusses the use of hormetic compounds for health benefits. Pasquale Abete and Franco Rengo present evidences to show how mild stress can be used to protect the ageing heart from pathological insults. Akmal Safwat argues that low-dose whole-body irradiation enhances the efficiency of the immune system. In conclusion, all the authors emphasize the perspectives for human beings, mentioning that hormesis can be used as an effective anti-ageing,

health-promoting and lifespan-extending strategy. The book is thought-provoking and opens an exciting new area for detailed study. It is highly useful for young researchers in biogerontology as well as for established biogerontologists to analyse their results in the light of hormetic effects. Thus the book is worth reading by not only biogerontologists, but by all those who are interested in understanding the hormetic approach for healthy ageing.

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Learning from Failure – Long-term Behaviour of Heavy Masonry Structures. L. Binda (ed.). WIT Press, Ashurst Lodge, Ashurst, Southampton, S040-7AA, UK. 2008. 256 pp. Price: £84.00/US\$ 168.00.

This book is an interesting compilation, which is completely dedicated to the study of long-term behaviour of historic masonry buildings. Decades of research experiences of several authors have been aptly divided into well-defined themes in nine chapters. The themes and the subjects of discussion in the book stem from the long-drawn studies conducted in understanding the collapse of centuries of old, heavy and tall masonry towers in Italy and other European countries. Walls of historical masonry structures are characterized by thick sections in order to reduce the intensity of stresses due to

various types of loading actions. Safety against collapse of such masonry structures is generally taken for granted when the masonry is thick and under low intensity of stresses. Long-term progressive damage due to creep stresses/strains and cyclic nature of loading with time can lead to collapse of even the heavy masonry structures. This point has been clearly brought out and demonstrated through discussions on experimental work, progressive monitoring of structural deterioration of some old masonry towers, and through analysis and modelling using numerical tools.

Experimental work on collapsed and existing structures, analysis/prediction of collapse and creep stresses using numerical techniques, monitoring long-term damage, repair techniques and application of probabilistic model to study the long-term behaviour represent the main themes discussed in nine chapters. Mechanical tests on materials (bricks, mortars and masonry prisms) collected especially from the collapsed Civic Tower of Pavia (Italy) and other *in situ* tests on existing heavy masonry towers throw light on masonry strength, stress-strain relations, and deformation characteristics under fatigue and creep. A new method of *in situ* testing using flat-jack test technique is an innovative approach to understand the mechanical behaviour of masonry under compression. Assessing residual life of the masonry has also been highlighted.

Step-by-step in time technique has been demonstrated to investigate time-dependent creep effects on redistribution of stresses, which throws light on long-term damage due to creep in masonry structures. The importance of monitoring and generating quantitative data on response of masonry structures subjected to various actions (load, thermal actions, micro-tremors, wind, etc.) using both static and dynamic monitoring techniques is clearly brought out. Use of numerical tools in assessing structural health and devising the monitoring scheme has been illustrated through some case studies. Discussions pertaining to such monitoring methods and the usefulness of such data to assess the health of the structure provide helpful guidelines for remedial actions and conservation of historical masonry structures.

The counteraction of creep damage in historical masonry structures is a serious concern for suggesting conservation measures. Bed joint reinforcement technique