

## BOOK REVIEWS

Title: "Earthquake Design Practice for Buildings"

Series: Civil Engineering Design Guide

Author: David E. Key

Publisher: Thomas Telford, London, 1988

Price: UK 35.00 pounds (Overseas 40.00 pounds), clothbound

ISBN: 0 7277 1315 9

### Chapter Headings:

1. The lessons from earthquake damage
2. Ground motion
3. The calculation of structural response
4. Isolation and energy absorbers
5. Conceptual design
6. Design codes and lateral force design
7. Reinforced concrete design
8. Structural steelwork design
9. Foundations
10. Masonry
11. Non-structural elements
12. Non-building structures: a guide

The author is a Research Fellow in earthquake engineering at Bristol University and combines this with continuing activity as a consulting engineer. He also has a background of chairing the Seismic Code Committee of Trinidad and Tobago which developed the first earthquake design standard for buildings in the region, as well as having been a recent chairman of the British Society for Earthquake and Civil Engineering Dynamics.

The book is aimed at practising engineers who want to learn the basic concepts of earthquake engineering and how these differ from ordinary design concepts. The basic areas of design detailing, lateral force load design and conceptual design are covered along with more specialist subjects with a view to enabling the reader to go further into them if he/she wishes, or perhaps even more importantly, whether to consult a specialist in the subject.

Most New Zealand graduates should be familiar with much of the material covered in this book but they may not be familiar with all of it. Besides quoting extracts from some NZ codes, there is considerable reference to work carried out by NZ engineers such as Park, Paulay and Priestley. Considerable reference is made to articles and study group reports published in the NZNSEE Bulletin. However, research and codes from other parts of the world are also referred to.

The book is well written and presents the concepts clearly. It is illustrated with a large number of photographs, diagrams and graphs. Many photographs show damage in Mexico City after the 1985 earthquake, in

addition to that from some other earthquakes, and are used particularly to illustrate the first chapter. There are many references as well as short bibliographies at the end of each chapter. These are arranged alphabetically for easy reference.

The book can be recommended as a sound guide not only to practising engineers who are unfamiliar with seismic design concepts but also to those who are, together with engineering students and teachers who want a concise design guide to what is sound practice.

Title: "Earthquake Resistant Design for Engineers and Architects" (second edition)

Author: David J. Dowrick

Publisher: John Wiley & Sons, Chichester, 1987

Price: 28.50 pounds sterling, clothbound

ISBN: 0 471 91503 3

### Chapter Headings:

1. Seismic risk - the causes, strength, and effects of earthquakes.
2. Seismic activity in a regional setting.
3. Determination of site characteristics.
4. Design earthquakes.
5. Earthquake resistant design philosophy - choice of form and materials.
6. Seismic response of soils and structures.
7. Concrete structures.
8. Masonry structures.
9. Steel structures.
10. Timber structures.
11. Earthquake resistance of services and equipment.
12. Architectural detailing for earthquake resistance.

This is the second edition of a book first published in 1977. The author is a well known structural engineer now based in Wellington. He currently works for the Physics and Engineering Laboratory of the DSIR but has had wide experience as a consulting engineer in the United Kingdom and New Zealand.

The first edition grew out of a design guide for architects and engineers in the international consultancy of the Ove Arup Partnership. The book has an international outlook with examples of design practice and research results taken from around the world. The material is divided almost evenly between seismology and ground motion, and different types of building structures. Thus it attempts to cover a very wide range of engineering from basic

concepts of ground motion and structural dynamics to recent advances in research and the design of complex structures.

In this new edition, there has been not only an updating of the material and the references, but also the addition of much new material. This is particularly so with regard to the treatment of seismo-techtonics, hazard analysis, design earthquakes, design philosophy, base isolation and geotechnical engineering.

The book provides a very good review of recent research and current design practices in earthquake engineering drawn from around the world. It covers a wide range of material from simple concepts to the more complex. The large number of design equations, figures and tables make this a very good reference book though it is perhaps too concise to be a textbook. The references at the end of each chapter are extensive, up-to-date and include a good share of New Zealand material. Unfortunately the references are not in either alphabetical or chronological order and there is no index of authors, though this would have been task given the number of references.

The book is well presented with very good line drawings and graphs. Unfortunately no photographs of earthquake damage have been used to illustrate the principles outlined in the text. There is a very useful appendix that covers special structures such as bridges, chimneys and towers, and low-rise buildings including houses. A second appendix presents some miscellaneous information including statistical methods for probability studies.

The book can be recommended to all practising engineers as a handy reference and guide, as well as a source of references for further study on specific topics.

Title: "In Spite of His Time - A Biography of R.C. Hayes, Earthquake Pioneer, Astronomer, Musician"

Author: Margaret Hayes

Publisher: New Zealand Geophysical Society

Price: \$24.95

In a technical journal it is not often that one reviews a biography, however it was a very pleasant change to put technical matters to one side and to read instead about Robert Cecil Hayes. While many biographies are detailed, dull and uninteresting, this one not only describes his achievements, scientific and otherwise, but also succeeds in bringing out something of his humanity.

Robert Cecil Hayes (1900 - 1977) was by profession a seismologist who between 1920 and 1960 took the infant science to maturity in New Zealand and established what is now the Seismological Observatory. In spite of having the most limited resources, he built a firm foundation for almost every kind of seismological research that has been undertaken in New Zealand since. While he achieved international recognition, Hayes suffered from a lack of local recognition in his early career. In this biography we can read of the effect this lack of recognition had on his career and on him as a person. Ultimately he received New Zealand's highest award for science, the Hector Medal of the Royal Society, for pioneering Seismology in New Zealand - but this came 15 years after he retired!

He was also an astronomer who from his own observations with a modest telescope compiled a catalogue of all the nebulae clusters and double and coloured stars visible through it. He had a passion for clocks and he looked after the NZ time service for most of his career.

This biography by his widow records how Hayes, a meticulous and very private man, viewed the evolution of New Zealand society through two World Wars and a major depression and during this time saw science in New Zealand develop from a largely amateur to a professional activity. In doing this, we read also of some of the Hayes family history, both past and present, along with an account of many other people who had something to do with the life of the Hayes family.

The book is written in a chatty style that makes it easy to read; it is also interesting to read. While the author has had to rely on other people for some of her account, much of it is about her life and times as well and this comes through as she writes about her late husband. This biography makes interesting reading and can be recommended to anyone who has an interest in New Zealand science - or for that matter to anyone who has an interest in our history and development and the people who have contributed to it.