and overturning moments.

3. Ohmori, N., "Studies on the Reinforced Concrete Slitted Shear Walls", Kajima Institute of Construction Technology, Japan, February 1976, 109 pp. The report summarises research results and presents design methods for reinforced concrete slitted walls.
4. Nakahara, Y., Ohtomo, T. and Yokota, S., "Development of New Method for Underwater Concreting - KDT Tremie Method", Kajima Institute of Construction Technology Report No 22, Japan, September, 1976, 38 pp. An account is given of the KDT Tremie Method comprising pipes of double tube structure, the inner tubes being flexible hoses and the outer tubes being slitted steel pipes.
5. Sato, K.et al., "Experimental Study on Beam-to-Column Connections Using Cast Steel T-Stubs", Kajima Institute of Construction Technology Report No. 23, Japan, November 1976. Results are presented of tests of steel beam-column connections utilising a simplified system with ordinary high strength bolted T-stub flange-to-column connection but with a special cast steel attachment called HISPLIT.
6. "Annual Report of Kajima Institute of Construction Technology", Vol. 24, 1975, 283 pp. Summaries are given of 48 research projects conducted by the Kajima Institute including seismic analyses and design studies (mainly in Japanese but abstracts are given in English in a separate volume).
7. "Strong-Motion Earthquake Records in Japan 1975", Vol. 20, National Research Centre for Disaster Prevention, December 1976, 78 pp. Details of 36 strong-motion accelerograph recordings in Japan in 1975 are given along with the earthquake characteristics.
8. Ambraseys, N.N., and Moinfar, A.A., "Iran Earthquakes 1969", Publication No. 63, August 1976, Technical Research and Standard Bureau, Plan and Budget Organization, Tehran, Iran, 21 pp. Macroseismic data and information from the five seismic recording stations at present in Iran is given for earthquakes during 1969.
9. "Acta Geophysica Sinica", Vol. 19, No. 3, 1976, 87 pp. (In Chinese.) Seven papers are presented on Chinese research on earthquake characteristics. Included in these is "Success of Prediction and Disaster Prevention of Liaoning (Haicheng) Earthquake - An Outstanding Achievement of the Great Proletarian Cultural Revolution".
10. Sandoval, J. H., "Sistema De Informacion Sobre Sismos", Universidad Nacionale Autonoma De Mexico, No. 348, January 1975, 82 pp. (In Spanish.) An information system for storing seismic data is described. Earthquakes from Mexico, Ecuador and Nicaragua registered between 1900 and 1974 are included in the system. A description of the computer program and user's manual is given.
11. Meli, R., "Comportamiento Sismico De Muros De Mamposteria", Universidad Nacional Autonoma De Mexico, No. 352, April 1975. (In Spanish.) Results of a research programme on the seismic behaviour of masonry are presented. The study included the mechanical properties of mortars and masonry units, behaviour of masonry assemblages under compressive and shear stresses, tests of full scale walls and walls encased in concrete frames under monotonic and cyclic lateral loading. Recommendations are made for design.
12. Rosenbleuth, E., "Diseño Optimo en Ingeniería Sísmica", Universidad Nacional Autonoma De Mexico, No. 354, July 1975, 21 pp. (In Spanish.) This paper presents an approach to optimization of structural design. Two limit states are considered, namely non-structural damage and collapse, and two basic design parameters, stiffness and resistance. Determination of seismicity is also discussed.
13. Bielak, J., "Modal Analysis for Building-Soil Interaction", Universidad Nacional Autonoma de Mexico", E17, July 1975, 39 pp. An approximate method of modal analysis is presented for the earthquake response of linear building-foundation systems. By making use of the modal shapes of the fixed-base superstructure, modal damping in the system is expressed as a weighted sum of the critical damping ratios of the superstructure plus an additional term representing the energy dissipated by the soil.
14. Faccioli, E., and Resendiz, D., "Soil Dynamics (Behaviour Including Liquefaction)", Universidad Nacional Autonoma de Mexico, E15, May 1975, 70 pp. Extract from the book "Seismic Risk and Engineering Decisions", this section deals with soil stress-strain relationships under stable conditions, local amplification, compaction and loss of strength, including liquefaction and cyclic mobility potentials, and soil exploration.
15. Stelzner, J., Güth, D. and Weyrauch, J., "Seismological Bulletin 1970 Station Moxa (MOX)", Central Earth Physics Institute of the Academy of Sciences of the German Democratic Republic, Berlin, 1976, 302 pp. This is an annual publication of seismological records at the Central Station, Moxa.

BOOK REVIEWS

DYNAMICS OF STRUCTURES by Ray W. Clough and Joseph Penzien. McGraw-Hill 1975. 634 pp. illus.

In a preface to the text, these two eminent professors fairly describe both the scope and the depth of its contents. The book arises from course notes for a programme of instruction in structural dynamics at the University of California, Berkeley. Entry to the main body of the text is through a concise initial chapter giving an "Overview of Structural Dynamics". This conveniently sets out the principles behind the present use of structural dynamics and most helpfully explains the organization of the chapters that follow. The book is then divided into four parts of increasing complexity, starting with a study of single-degree-of-freedom systems and progressing logically through multi-degree-of-freedom systems, distributed-parameter systems and random vibrations. Although aimed primarily at the structural engineers, as a short but valuable chapter on "Seismological Background" indicates, the book would provide a valuable theoretical

reference manual for anyone involved in a field of dynamic loading. However, potential buyers will be disappointed if they believe that they will get a quick means of looking up and solving their particular dynamics problem. The text is fundamentally a course in theoretical mechanics which needs to be appreciated as such. Derivations of formulae are meticulously attended to - helped by simple, but most adequate, line diagrams where necessary. The individual reader, using the book as a course of study, will find the frequent worked examples an excellent help but will have to find someone else to tell him whether his answers to the most realistic problems set at the end of each chapter are correct.

This is not a book for the faint-hearted who blanches at the sight of matrix notation. It contains a text that must be familiar to any practising engineer involved in setting up dynamic analysis computer models of his structures but the dilettante should leave it to the university Master's student of structural dynamics and perhaps instead tackle the more general text of something in the line of "Earthquake Engineering" edited by R. L. Wiegel.

Retail price approximately $34.

R. D. Sharpe

SEISMIC RISK AND ENGINEERING DECISIONS. C. Lomnitz and E. Rosenbleuth (Editors). Elsevier, 1976, 425 pages.

Reference to technical papers and books will give earthquake engineers a reasonable knowledge of geotectonics, seismology and structural analysis and design. Cinna Lomnitz and Emilio Rosenbleuth claim that the earthquake engineer receives little guidance on what earthquake disturbances he should design for. Whether "Seismic Risk and Engineering Decisions" bridges the gap is open to question, but the book is certainly a substantial contribution to the problem.

There are ten chapters:

Chapter 1. Introduction. The Editors.
2. Earthquakes and Earthquake Prediction. C. Lomnitz and S. K. Singh (28 pages).
3. Geological Criteria for Evaluating Seismicity. C. R. Allen (40 pages).
4. Soil Dynamics: Behaviour Including Liquefaction. E. Faccioli and D. Resendiz (70 pages).
5. The Physics of Earthquake Strong Motion. J. N. Brune (38 pages).
6. Seismicity. L. Esteva (46 pages).
7. Tsunamis. R. L. Wiegel (62 pages).
8. Structural Response to Earthquakes. E. H. Vanmarcke (52 pages).
9. Design. R. V. Whitman and C. A. Cornell (42 pages).
10. Seismological Instrumentation. T. V. McEvilly (34 pages).

The expertise of the chapter authors guarantees a valuable treatise on earthquake engineering. There is some variation in treatment but generally the emphasis is on practical issues and the text is well illustrated with tables and diagrams.

I found chapter nine, on seismic design decision analysis, the most interesting chapter as it brings together much of the recent work in this rapidly evolving field. The theory is there but the chapter includes many examples which illustrate well the potential for this type of investigation. The results of several risk studies are presented, and Whitman's work on the marginal cost of earthquake resistance is reviewed. There is also a rather speculative section on the "maximization of utility" in the provision of earthquake resistance in structures. The results of these studies are of little consequence in the New Zealand context, but the approach is of interest and potentially relevant to the establishment of economic loading levels in this country.

I also found chapter three interesting and controversial. Quaternary faulting in California and Turkey is outlined in some detail, and there are smaller sections on Japan, Phillipines and China. His thesis is that surface faulting during large shallow earthquakes ".... is more universal than has been recognised", and that a detailed study of quaternary faulting provides a basis for the proper delineation of seismic zones. As a side issue he develops an interesting discussion on long-term variations in seismicity.

Chapter four contains sections on soil stress-strain relationships, local amplification of ground motions, compaction and loss of strength, and soil exploration. Numerical models for predicting soil behaviour during earthquake motions are illustrated with many examples drawn from the literature.

Chapter five is a good introduction to this complex subject and not too technical. Chapters six, eight and nine require some knowledge of probability and statistics. Chapter eight is concerned with the prediction of the response of structures with known dynamic characteristics to partially specified ground motions. Three procedures are reviewed, the response spectrum approach, time integration based on one or more accelograms, and random vibration and analysis. Tsunamis (either generated in the ocean or in bays and reservoirs) are covered in detail in Chapter seven.

Engineers involved in seismic risk analyses may find, as I have, that the book tends to skirt around the issues where guidance is most needed. For example, what is the likely effect of focal depth on the characteristics of strong motions, and on their attenuation characteristics? What parameter(s) measure best the damage potential of an earthquake? The dynamic behaviour of soft soils is another subject where the engineer needs guidance.

There is no doubt that the book contains a vast amount of information and that it will be valuable reference text. It is easy to read and well laid out, but expensive at $NZ68.

R. J. Bentley