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BOOK REVIEWS

Source Book in Geology 1900–1950. Edited by Kirtley F. Mather, Harvard University Press, Cambridge, 1967, 435 pp. $12.50.

This source book covers the time period 1900 to 1950. It quotes sixty-five important papers. I would class twenty-seven of them as having to do with surface geology (geomorphology and sedimentation); nine pertain to geophysics, including dating by radioactivity; eight deal with tectonics and structure; thirteen relate to petrology and mineralogy; and three each to paleontology and to mining-petroleum geology.

In my own field at least the papers are well chosen. Particularly, I approve the inclusion of R. D. Oldham's 1906 paper on "The Constitution of the Interior of the Earth as Revealed by Earthquakes." It should be read by all seismologists who do not know it for it contains the whole story except for the classic paper by A. Mohorovičić ("Das Beben vom 8.X.1909", Jahrbuch des Meteorologischen Observatoriums in Zagreb (Agram) für das Jahr 1909, Zagreb (1910)) (not cited). Since then we have been refining it. I am aware of the argument that young men should not read the classics of their fields because it would discourage them in their feelings of victory in discovery of "new" ideas. But I do not endorse this view.

As for care in the references, my name is misspelled three times and the reference to *Bull. Geol. Assn. Am.* (footnote, p. 402) should read "Soc." instead of "Assn.". If this is an isolated case it is trivial. Concerning this reference which is to a one paragraph abstract: since the text above states that "the matter should be investigated further", I may add that it was, in the *Bulletin of the Seismological Society of America*, Vol. 40, pp. 291–298, October, 1950.

Perhaps a better reference than the one given to the Elastic Rebound Theory of Harry Fielding Reid (The California Earthquake of April 18, 1906, Carnegie Institution of Washington Publication 87, Vol. 2 (1910), "The Mechanics of the Earthquake", pp. 29–32) would have been University of California Publications, *Bull. Dept. Geol. Sci.* **6**, 413–433 (1910).

Anyone could list additional works he considers worthy of inclusion but the point is that all of those included are worthy.

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The Prince William Sound, Alaska, Earthquake of 1964 and Aftershocks, in 3 vol., Fergus J. Wood, Editor-in-Chief. Volume II, part A: *Engineering Seismology*, U. S. Department of Commerce, Environmental Science Services Administration, Coast and Geodetic Survey, U. S. Government Printing Office, Washington, 1967; 392 pages; map and phonograph record $5.50.

This second part of the comprehensive report on the Alaskan earthquake being issued by the U. S. Coast and Geodetic Survey was prepared by practicing engineers for the structural engineering profession. The papers have been assembled by Karl V. Steinbrugge, who has contributed an introduction giving a concise summary of background information on the earthquake engineering aspects of the earthquake. Approximately one-half of the volume is devoted to a survey of Building Damage in Anchorage, by K. V. Steinbrugge, J. H. Manning, and H. J. Degenkolb, with the assistance of a committee from the Structural Engineers Association of California. This section gives an extensive photographic coverage of the building damage, along with many floor plans, construction drawings, and sketches noting design details of special relevance to building damage. The calculations forming the basis for the conclusions reached in the case studies of particular structures are not included, but some examples are given in an appendix of seismic calculations for a typical shear wall in a tall building. The landslides in Anchorage, which were an especially noteworthy aspect of the earthquake effects, are covered in considerable detail in a chapter by S. D. Wilson. Included along with a photographic presentation are details of the soils investigations, studies of slope stability, mecha-

nism of the slides, and remedial measures. The behavior of certain special types of structures are discussed in chapters by J. E. Rinne on oil storage tanks, and by J. F. Meehan on public school buildings. W. K. Cloud brings together the limited available data on ground motion records, including accelerograms and spectrum curves for several small aftershocks. The results of measurement of the fundamental natural periods of several buildings in Anchorage are reported. A second chapter by Cloud gives the results of forced vibration measurements of a damaged multi-story building in Anchorage, with resonance curves, mode shapes, and natural periods and damping of lateral and torsional modes of vibration. In a chapter by J. A. Blume, these experimentally determined values for the damaged building are compared with estimated pre-earthquake properties of the structure as inferred from a dynamic analysis. A chapter by H. Kawasumi and E. Shima of the Earthquake Research Institute of the University of Tokyo gives the results of the microtremor measurements in the Anchorage region, along with spectrum curves and a study of possible relationship between spectrum peaks and calculations based on estimated thickness of sub-soil layers and approximate shearwave velocities. Included with the volume is a $33\frac{1}{3}$ rpm phonograph record reproducing a tape recording made during the earthquake which gives some interesting sidelights on human responses to earthquakes as well as some valuable information on the time duration of the heavy ground shaking. The Alaskan earthquake contains many lessons for earthquake engineers, and the availability of so much factual information at a bargain price is a notable contribution.

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Seismic Love Waves, by Z. S. Andrianova, V. I. Keilis-Borok, A. L. Levshin and M. N. Neigauz, translated from the Russian by F. M. C. Goodspeed, Consultants Bureau, New York, 1967, 91 pp.

This monograph is devoted to a methodical mathematical study, using the spectral theory of linear differential operations, of surface Love waves. The authors are affiliated with the Institute of Chemical Physics and the Institute of Physics of the Earth of the Academy of Sciences of the USSR.

Chapter 1 develops the basic theory of Love waves, Chapters 2 and 3 describe how Love waves are used to infer the structure of the crust and upper mantle and Chapter 4 treats the relations between observations and parameters of the source. An appendix contains results which were not present in the original Russian edition discussing the effects of sphericity and absorption and the calculation of partial derivatives of phase and group velocity with respect to the elastic parameters of the media.

A brief view of the approach used in this monograph can be given as follows. Consider the familiar equation for Love waves in a layered media

$$\frac{d}{dz}\left(\mu(z)\,\frac{dV}{dz}\right) + \{\sigma^2\rho(z) - \xi^2\mu(z)\}V = 0 \tag{1}$$

where $\mu(z)$ is the rigidity, $\rho(z)$ is the density, ξ is the wave number and σ the characteristic frequency. Boundary conditions are that $dV/dz = 0$ at $z = 0$, continuity of V and $\mu dV/dz$ at interfaces and vanishing of the displacement at infinity. The investigators define a continuous function

$$\theta(z) = \arctan\left(\frac{\mu(z)\,\dfrac{dV}{dz}}{V}\right) \tag{2}$$