

Underground Sound. Application of Seismic Waves. J.E. White. Methods in Geochemistry and Geophysics, 18, Elsevier, Amsterdam, 1983, xvi + 253 pp., US \$59.50 (USA and Canada), Dfl. 140.00 (hard cover).

In the preface J.E. White says that the motivation for writing the book was sparked by the continuing inquiries from around the world concerning the availability of a former book of his, entitled 'Seismic Waves'. The content of this new book draws heavily on the earlier one, and the subjects which are treated are almost identical. However, as might be expected the newest theories and experimental results are incorporated into this updated version. This has resulted in an extended treatment of some of the subjects and sometimes a complete rewriting of a chapter.

The subjects which are treated concern the behaviour of seismic waves, their propagation, attenuation and radiation. After an introductory chapter in which some mathematical tools, such as the Fourier transform and convolution are briefly described, the second chapter deals with the characteristics of plane waves in isotropic and in transversely isotropic elastic media. The author describes their behaviour at plane boundaries separating two solids or separating a solid and a fluid, and their behaviour at a stress-free boundary. This chapter gives the mathematical framework for the other chapters. In Chapters 3 and 4, which I think are the best part of the book, the author reviews the many articles in literature which study the relationship between the properties of rocks and seismic wave propagation. In Chapter 3 he looks at laminated solids, granular media, fractured rocks and liquid suspensions and shows how the elastic constants and wave speeds can be derived for such materials. In Chapter 4, which deals with loss mechanisms and attenuation, he reviews experimental data on the nature of attenuation and discusses several theoretical models to clarify the mechanisms of energy loss.

Borehole data are often used to study the properties of rocks. For a correct interpretation of such data an adequate understanding of wave propagation along boreholes is needed. In Chapter 5 the author describes the characteristics of waves in boreholes, looking at tube waves at low frequencies, waves along an empty hole and along a fluid-filled hole. In Chapter 6 he describes the characteristics of the wavefield generated by a point source in an unbounded isotropic or transversely isotropic medium, and the characteristics of the wavefield due to point sources at boundaries.

The book has a pleasant way of reading and the author has kept the mathematics to an intermediate level. In view of the continuing inquiries after his former book and the fact that this new book is more up to date and treats some aspects more extensively, I expect a great interest in this new book, not only among students preparing for a career in exploration geophysics but also among practicing geophysicists who have already experience in seismic exploration.