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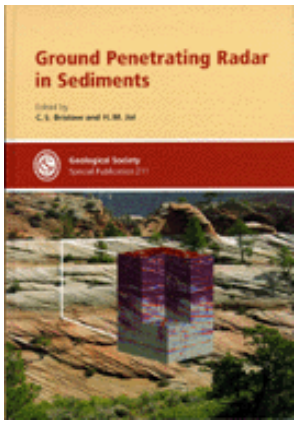

Ground Penetrating Radar in Sediments, edited by C.S. Bristow & H.M. Jol, 2003. The Geological Society of London, Brassmill Lane, Bath (Summerset), United Kingdom BA1 3JN. Hardback, 330 pp. Price GBP 80.00. ISBN 1-86239-131-9.

Ground penetrating radar, better known by its acronym GPR, is rapidly evolving as a tool for gathering shallow subsurface data in geologic, environmental, and geomorphic investigations. In the appropriate sedimentary environments, GPR provides access to information on the composition, structure, and morphostratigraphy of the subsurface environment, yielding clues into its formative elements. One key to the increasing use of the technique is that GPR is non-invasive, and can therefore be deployed in environmentally sensitive and restricted environments, such as national parks and preserves. As a response to the growth of the field, a research meeting was hosted by the Geological Society of London and the University College of London in 2001. The result of that gathering is this volume of collected papers from participants of that meeting. The topics covered in this volume are as varied as the participants, who range from theorists to practitioners.

One strength of the text is the lead off section with its introduction and general methods chapters, both written by the editors. The introduction sets the stage of the book, presenting an overview of the structure of the volume and the topics included. Following that is a chapter providing an overview of the basics of ground penetrating radar theory and practice. This chapter makes use of the experience gained by the authors from over a decade of GPR applications in different environments, and provides a solid primer for the uninitiated as well as a review for the moderately experienced. This primer is reinforced through discussion of theory and practice in many of the papers (e.g., Degenhart et al.)

Following these introductory chapters, the volume is organized by stratigraphic environments and applications: aeolian and coastal, fluvial and alluvial, glacial, engineering and environmental, ancient sediments, and methods. As a case-study book, the text is fairly well balanced within each section, and there is a diverse representation of studies presented. Often a failing of volumes of compiled case studies, the local, focused nature of these papers is offset by the global occurrences of the features or sedimentary environments discussed. Papers such as the studies of the alluvial fan in British Columbia (Èkes & Friele) and glaciofluvial braided channels in Germany (Heinz & Aigner) establish templates, in a sense that could be applied to studies of similar features or settings elsewhere. A number of topics, including GPR applications to study dune reactivation (Botha et al.) and coastal (Moller & Anthony) and palaeolake (Smith et al.) sedimentary features, caught my attention and provide examples of approaches that can easily be transferred to my research. Similar statements could be made for those involved in the studies of modern (jökulhaups, fluvial) and earlier (rock glacier) processes and landforms.

Reflecting the reality of using the technology, there are also cases of difficulties presented in their discussions. Havholm et al. note surprise at the shallow (i.e., < 5 m) signal penetration in a dune environment, a sedimentary setting that should produce deep signal penetration (e.g., 15-20 m; Botha et al.). Havholm et al. attribute the lack of signal attenuation to pedogenic silts,

clays, and sesquioxide accumulations. Èkes & Friele also discuss interpretation of reflectio- free facies resulting from various interferences within the subsurface. The limitations of the technology are further discussed within the theoretical framework sections of various papers.

The quality of the graphics varies in the text. The best figures are doublets, with radar profiles shown in parallel with annotated interpretations. Problems arise when long profiles are not given the necessary space to adequately show details that are often minute. Smith et al. use larger-scale foldouts of the data traces, resulting in a more favorable and easily read presentation of data. Some images are too dark or have too little contrast to be effective, even with annotation.

There are areas and applications that are missing from this collection, such as the use of GPR in studying glacial structures, archaeological investigations, or imaging of modern lake and stream sediments. But as with many new and rapidly adapted and adopted technologies, the fields of study lacking representation lend support for holding future research meetings such as the one that spawned this volume. Overall, this is a well produced volume that provides a great deal of utility for both the experienced practitioner and the novice planning their first foray in the field.

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