BOOK REVIEW

HILLSLOPE FORM AND PROCESS, by M. A. Carson and M. J. Kirkby. Cambridge University Press, Cambridge, 1972. 475 p.

The study of slopes has long been regarded as the core of geomorphology, but it is only in the last 15 years that teaching in the subject has developed beyond the stage of being a mere description of the theories of W. M. Davis, W. Penck and L. C. King. Until now there has been no attempt to produce a comprehensive review of advances in slope studies. The authors have set themselves a high standard by seeking to do for the study of hill slopes what Leopold, Wolman and Miller's *Fluvial Processes in Geomorphology* did for stream channel form and process.

Hillslope Form and Process is divided into: an introduction which discusses systems and concepts; part 1 which is concerned with the sources of energy for debris transport on slopes, and the resistance to transport; part 2 is a study of erosion processes; part 3 is an account of the relationships between processes and lithological and climatic environment and the stage of development of the landscape; part 4 is a synthesis of slope profile development.

The feature which separates this book from all other major works on the subject is its strong emphasis on slope processes. The work of hydrologists, soil scientists, conservators and engineers is drawn together, and a fundamental study of the strength of slope materials and the forces acting to overcome that strength is presented as the foundation for all that follows. The traditional geomorphologist of 10 years ago would hardly realize that he was reading a book about hillslopes until he was well into part 2, but the laying of a firm foundation in the basic laws of physics, mechanics and hydraulics is exactly what has been missing from geomorphology for so long. The comprehensive use of work in soil mechanics makes clear many of the relationships between slope forms, processes and materials which have either been ignored or guessed at in the past, and the simple elegance of the presentation will clarify the basic concepts for all but the most obdurately non-mathematical.

A major feature of the book is the use of process-response models which attempt to predict the hillslope forms resulting from the operation of specific processes. In most cases these models are developed for each process, and although the argument is convincing, the models remain to be tested and the interrelationships

amongst the various processes are so little understood that part 3 of the book has a rather inconclusive feel. This section is in many ways an integrating part, but its descriptive approach serves more to demonstrate the weakness of the climatically determined models of hillslope form than to bring together the discussion of earlier chapters.

The synthesis of part 4 is a valuable review of what the classical geomorphologists really said, rather than of what they are thought to have said, and an original contribution to theories of slope form.

Hillslope Form and Process is a major contribution to geomorphology which reviews and synthesizes contributions from many disciplines. It shows how various approaches have and can contribute to developments in the subject, and as such it must surely become the main work for advanced students.

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