cepts, referring the reader instead to the appropriate sources for fuller details. He has chosen to deal in succeeding chapters with the response to wind of single leaves, whole plants, and finally crops. Although this approach is logical and undoubtedly has merit, it invites overlap, repetition, and fragmentation of the subject. Grace has skillfully minimized the first two problems, but some readers may question the wisdom of splitting the description of the important exchange processes, with some exchange processes described in a discussion of the single leaf (pp. 45–54) and some described in a discussion of the canopy (pp. 91–103). Again there would be some advantage in bringing together the important discussion of the effect of wind on water use, which is based largely on the theoretical and modeling work of J. L. Monteith and D. M. Gates on single leaves (pp. 61–69), and the discussion of the complex question of water use by sheltered plants, which is well handled in the section on the physiology of sheltered crops (pp. 130–135). Descriptions of various mechanically induced injuries and adaptations are present in all four chapters and collectively form a valuable compilation of both the well-recognized and some little-known physical effects of wind.

The final chapter, on ecological aspects of wind, will be of interest primarily to botanists concerned with the contribution of wind to the zonation of vegetation in mountain and coastal regions. In relation to the space allowed for the other topics discussed in the book, this topic is dealt with rather fully. The chapter also includes a short résumé of the effect of topography on wind flow that would be more appropriately included in the first chapter. On the other hand, some discussion of the ecological importance of wind dispersal of pollen and plant pathogens, and of insect fallout and concentration in sheltered zones, would be a useful addition to this chapter.

The author's holistic approach is commendable: possibly information in addition to the physics of particle movement could have been given on wind erosion, especially considering that the single major reason for windbreak use around the world is to control soil blow and its consequences. For example, recent experiments suggest that airborne soil particles can act as direct inoculating agents for certain plant pathogens. Only passing mention is made of the differential response to shelter shown by cultivars of a given species, in spite of the increasing evidence for this and the possibility of breeding plants with physiological and morphological features that can exploit still further the shelter benefit. Again only one example of shelter affecting crop quality is mentioned, although several are known from the Russian literature.

Aside from these fairly minor omissions and the organizational problems, the author has succeeded in his objectives and has produced a readable, coherent, sound book. He rejects the widely held view that conservation of water is the main benefit of shelter; instead he musters and analyzes the factors responsible for the shelter effect while acknowledging that their actions and interactions are still imperfectly understood.

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Mass Movement Phenomena

Rockslides and Avalanches. Part 1, Natural Phenomena. BARRY VOIGHT, Ed. Elsevier, New York, 1978. xviii, 834 pp., illus. $98. Developments in Geotechnical Engineering, 14A.

The purpose of this book is to provide a standard reference for studies of natural mass movement phenomena, especially rockslides and avalanches. The 25 papers by 32 authors are of two types, descriptive and analytic, and the best papers are both, although in varying proportions. Some of the descriptions are new and, in those cases where they are superimposed upon previous descriptions of the same rockslide, will be permanent references to important details of the slides. In this category are descriptions of several classic slides: the Elm, Sherman, and Huascarán avalanches, the Frank, Gros Ventre, Madison Canyon, Mayunmarca, and Blackhawk rockslides, and the Heart Mountain thrust sheet. These chapters are necessary reading for students of landslides. The mechanical analyses are generally unoriginal, although they provide direction for new field observations, as they should. The book thus represents a heartening acceleration of a fundamental change in geology from arm-waving speculation to application of basic science.

I was delighted with the chapter by K. J. Hsü on Albert Heim's classic description and mechanical analysis of the avalanche at Elm, Switzerland. In many ways Heim's approach is reflected in the best papers in the book. But Hsü's chapter is not simply a translation of Heim from the German; rather, Hsü has freely interjected his own ideas to produce a classic in its own right. Voight's study of the Gros Ventre slide in Wyoming technically is probably the most thorough analysis of a large slide, clearly presenting the detective work required to decipher the feeble record of even a historic event. Besides, Voight livens up dry observation and theory with anecdotes, such as the predictions of impending disaster by "Uncle Billy," a bear hunter whose cabin turned out to be directly in the path of the slide. The most clever applications of mechanical analysis are by G. Plafker and G. E. Ericksen, who describe the 1970 Huascarán avalanche in Peru. Using aerial photography, for example, they measured the lengths of mud-free shadows of large rocks to determine the trajectories and launching sites of boulders that rained down upon the community of Huashau. These and other data indicate that parts of the avalanche were traveling at speeds of up to 1000 kilometers an hour.

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Biosocial Bases of Criminal Behavior. Sarnoff A. Mednick and Karl O. Christiansen, Eds. Gardner Press, New York, 1977 (distributor, Halsted [Wiley], New York). xx, 298 pp. $22.95.

Chance, Cause, Reason. An Inquiry into the Nature of Scientific Evidence. Arthur W. Burks. University of Chicago Press, Chicago, 1977. xvi, 694 pp. $27.50.

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