somewhat uncomfortable. Responses as indicants of discrimination are indeed important in Eleanor Gibson's thinking, and even though it is the stimulus that is learned, we (the scientists, that is) must learn about the learning by paying close attention to the nature of the discriminative response used by the experimental subject.

Why this difference, James Gibson emphasizing direct cognition, and Eleanor Gibson emphasizing discriminative perception? Certainly it is in line with their backgrounds, one having come from a partly introspectionist training at Princeton, the other from a stimulus-response tradition at Yale. But more than that, it reflects the inherent limitations the student of development must accept in studying perception in either animals or children, particularly preverbal children. It is essentially impossible to find out how a child or an animal knows the world; but it is quite easy (relatively speaking) to find out whether an organism can discriminate aspects of the world, and the discrimination learning procedures are the ones to use. With adults, capable of accepting complex instructions and of giving verifiable complex responses, we can learn much more about the nature of knowing, about perception as cognition.

So Eleanor Gibson is emphasizing a point of view entirely appropriate to her subject matter, but one that is perhaps still methodologically limited. Nevertheless, her thinking about the nature of perceptual development has gone far beyond any such limitations, and we are indebted to her for an excellent addition to the study of perception and its development.

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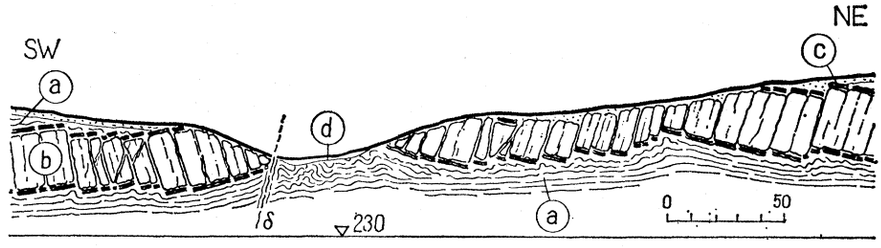
Instabilities

Landslides and Their Control. QUIDO ZÁRUBA and VOJTECH MENCL. Elsevier, New York, and Academia, Prague, 1969. x + 206 pp., illus. $14.50.

This book is organized about a fourfold geological classification of landslides, to wit: superficial slides; slides in weak rocks; slides in solid rocks; and other types. Superficial slides include creep of debris, sheet slides, earth flows, and debris flows. Slides in weak rocks are divided into those on cylindrical shear surfaces, those on ancient slide surfaces, and those caused by bulging or



Squeezing out of marly shales on the valley bottom of the Lucina River near Ostrava, Czechoslovakia. *a*, marly shales (Lower Cretaceous); *b*, teschenite; *c*, contact metamorphosed slates; *d*, disturbed shale beds in the valley bottom. [From *Landslides and Their Control*]

squeezing of soft layers. Solid rock slides are those controlled by geological structure, slides associated with the long-term deformation of mountain slopes, and rock falls. Under the fourth category are solifluction phenomena, quick clay slides, and subaqueous slides. One of the most interesting chapters gives geological examples of every type, including many totally new to this reviewer.

Since slides are geomorphic features, terms expressing the stage and degree of development are useful. Thus the authors refer to *active*, *dormant*, and *fossil* slides. Dormant slides are those for which the basic causes persist, so that there is a possibility of renewed movement. Fossil slides, in contrast, cannot revive under present climatic conditions. The degrees of development of landslides are defined as *initial*, *advanced*, or *exhausted*, according to the relative degree of cracking and of emptying of the head area. In the initial stages, the factor of safety can be estimated from the degree of development. Slides may be active, fossil, or dormant in any of the three degrees of development.

The type of slides in weak rocks caused by bulging or squeezing up of soft layers is illustrated by fig. 5-36, reproduced here, which shows a slide associated with a "valley anticline"—an anticline caused by upward bulging of shale accompanying unloading by erosion. This process is accompanied by a tension cracking in the more rigid strata in the valley sides. A very similar occurrence in Dallas, Texas, accompanied the collapse of an excavation several years ago.

The authors do not pretend to present a highly technical work with the latest refinements in analysis and corrective measures, but they are careful to give extensive references on these subjects and to provide a review of the basic phenomena which will be helpful to those who have not closely followed these areas. Almost no attention has been paid in landslide literature to the measurement of stresses accompanying landsliding. The authors give examples of their own stress measurements in slides using rock-mechanics methods; they point out that these methods are well suited in view of the small deformation moduli and therefore relatively large displacements that accompany the release of strain when stress measurements are carried out in clays and weak rocks. The book also reviews various methods of stabilizing slides, giving examples from practice. These methods include excavation, drainage, plantings of vegetation, construction of retaining walls and similar structures, the use of rock bolts, stabilization of slopes by piles and hardening of soils by grouting and electrical techniques, and finally the rupture of the slip surface by blasting.

In summary, the book is a complete study of the enormously interesting subject of landslides, including not only those slides produced in the natural terrain and considered as geologic phenomena but those produced by man and his activities as well. It is very well written from both the geological and the engineering point of view and is thorough in both fields to a degree seldom achieved in a single work.

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Troposphere and Stratosphere

Climate of the Free Atmosphere. D. F. REX, Ed. Elsevier, New York, 1969. x + 450 pp., illus. $52.50. World Survey of Climatology, vol. 4.

In the 15-volume series *World Survey of Climatology*, 3 volumes are devoted to "general climatology," 11 to regional climatologies, and 1 to the climate of the "free atmosphere."

The editor of the present volume has