is presented in the book. Furthermore, even if such comparisons had been presented, interpretation of the results would likely be complicated by variations in the type of cognition being evaluated (for example, fluid vs. crystallized) and in the amount of cumulative experience the individual has had with a given task or activity.

A related problem appears to exist with respect to the entire field of everyday cognition because its domain has been neither explicitly defined nor clearly delineated from cognition that is not everyday. This issue is discussed by several of the contributors (J. Hartley, R. West), but the classification of precisely what is, and what is not, everyday cognition remains highly subjective. There does appear to be some agreement that it is not simply the nature of the stimulus material that determines whether what one is studying warrants classification as natural, realistic, or everyday. Thus, the mere substitution of, for instance, meaningful prose for lists of unrelated words in research on memory does not by itself constitute study of everyday cognition. In their respective chapters, J. Sinnott and West also suggest that neither the method of stimulus presentation nor the method of assessment is sufficient to characterize a cognitive task as a realistic simulation of everyday cognitive activity because the motivation for engaging in the cognitive activity may be different when it is performed at the request of a researcher. Indeed, the assumption that cognition may vary as a function of the overall context, which is presumed to be determined not only by the materials and methods but also by the individual's level of motivation, prior experience, relevant knowledge, or personal goals has led some everyday cognition researchers to argue that it may be impossible to stimulate all aspects of the natural context in the restricted and unrepresentative context of a research laboratory. A key theme of the everyday cognition perspective, therefore, is that results from sterile and contrived situations may not generalize to less constrained and more natural environments.

An important unresolved issue concerning the everyday cognition perspective, which is alluded to by several authors in this volume, is how one might be able to evaluate whether a laboratory simulation is realistic with respect to everyday cognitive functioning. Several contributors (Denney, A. Hartley) note that existing psychometric tests of the type often criticized as artificial and unrealistic have been fairly successful in predicting outcomes such as success in school and occupational level. What is sorely missing are additional criteria that might have greater validity as reflections of competence in a wider range of everyday life (D. Kausler). Landauer's chapter suggests that what is needed is a complete inventory of the cognitive requirements of everyday activities accompanied by knowledge of how people actually use cognitive abilities in their natural environments. However, even vast quantities of this type of information may be inadequate if one believes that most cognitive activities can be decomposed into simpler processes or components. If this is the case, then an analysis of the activities of everyday life in terms of the hypothesized processes or components would also be needed to determine the frequency and distribution of these more elementary cognitive components.

Although research falling under the rubric of everyday cognition has been accumulating for nearly 20 years, a definitive conclusion about the contribution of such research to the understanding of human cognitive functioning will likely have to wait until complete and accurate information is available about the actual nature and frequency of everyday activities. Until that time, however, this volume should function as a useful interim report on a very active area of research in the broad field of cognitive psychology.

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Cordilleran Magmatism

Andean Magmatism and its Tectonic Setting. RUSSELL S. HARMON and CARLOS W. RAPELA, Eds. Geological Society of America, Boulder, CO, 1991. vi, 309 pp., illus. Paper, $62. GSA Special Paper 265.

The igneous rocks that underlie the Andean Cordillera from Colombia to southernmost Chile and Argentina contain the most long-lived and spectacular record of processes attending the subduction of an oceanic (Nazca) plate beneath a continental (South American) plate margin. The volcanism, plutonism, uplift, faulting, and translation of the crust that have occurred at similar plate margins have undoubtedly shaped the gross chemical and physical character of all continents throughout the past several hundred million, and perhaps several billion, years. Geologists have long been attracted to chains of recently active Andean volcanoes, and this is reflected in the sophistication of data that have been collected and the questions addressed. However, the understanding of older phases of volcanic and plutonic activity in the

Andes has been advanced far less.

This volume is a collection of 20 papers contributed by 60 authors of 10 nationalities and represents the fruit of the International Geologic Correlation Program (IGCP) Project 249, from which the book gets its title. The editors suggest that it serve as an introduction for earth scientists interested in Andean magmatism and tectonism. Although the book will adequately serve this purpose for the next few years, the papers, which touch on many aspects of Paleozoic, Mesozoic, and Cenozoic magmatism and tectonism, vary dramatically in content and quality. Papers concerning the pre-Tertiary record are largely descriptive and break little new ground toward advancing the understanding of igneous or tectonic mechanisms and processes. They do, however, offer a view of the distribution of various suites of igneous rocks of different ages and highlight how much of the older geology remains very poorly constrained. Interestingly, not a single paper in this book focuses on modern or ancient igneous rocks from the northern Andean volcanic zone in Ecuador and Columbia, and only one paper discusses the Andes of Peru.

One of the most lively current debates in earth-science concerns the relative importance of several components of subduction-zone magmas that have erupted from Andean arc volcanoes. Determining accurately how much material is contributed to these magmas from subcrustal mantle melting, from crustally derived sediment transported into this mantle source region (either carried down recently on the Nazca plate or as long-lived, chemically distinct mantle domains), and from the 35- to 70-kilometer-thick continental crust through which the magmas ascend is critical if we are to understand how crust forms and evolves and how crustal material transported to deeper levels in the mantle controls the chemical heterogeneity of this large and important volume within the earth.

The controversial question of sources for magma erupted from recent Andean volcanoes surfaces in the three most lucid and provocative papers in the book, adding some new data and considerable fuel to the debate. Specifically, the paper by Tormey *et al.* suggests that the chemical signature of varying degrees of partial melting of the subcrustal mantle from south to north beneath modern Andean volcanoes in Chile can be discerned despite the evidence that crustal rocks through which the magmas pass also significantly affect the composition of these same magmas. The paper by Kay *et al.* on temporal changes in lava composition at mid- to late Tertiary volcanoes in northern Chile and Argentina, where the crust has thickened with time, suggests that crustal contributions to the magmas increased as the crust became thicker. Like Tormey *et al.*, Kay *et al.* also suggest a role for erosion of the continental margin and the subduction of spatially and temporally variable amounts of this crust into the mantle source regions. In my judgment, however, the chemical and isotopic variations of these lavas do not provide compelling evidence for recognizing differences in mantle contributions to Andean magmas. In this light, Davidson *et al.*'s paper succinctly clarifies the ambiguities inherent in using chemical and isotopic data from the lavas themselves as the sole criteria for getting at source composition. Their discussion focuses on recent volcanism in northern Chile and southern Bolivia and, in opposition to Tormey *et al.* and Kay *et al.*, Davidson *et al.* contend that although some variability of mantle sources beneath the Andes may exist, melting and assimilation of deep crustal rocks into ascending magmas thoroughly obscure any chemical signatures from the mantle. These papers not only expand the dimensions of the controversy but also lay some of the groundwork for future studies.

Earth scientists interested in the basic geologic framework of the southern Andes (Bolivia, Chile, and Argentina) or arc magmatism in general will find this book a useful resource, and volcanologists and petrologists will appreciate the more provocative chapters.

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