found in birds. D. Amadon produces figures of about 250 species for the African rain forests and 550 species for the Amazonian ones. The mammal faunas, by contrast, are much more comparable, although Amazonia has a particularly rich bat fauna (F. Bourlière). The Amazon aquatic system is also much richer than that of the Congo; it has some 1300 species of fish against 560 in the Congo (R. Roberts). The freshwater turtle fauna of the former is also twice as rich (R. F. Laurent).

How are these differences to be explained? Richards notes that evidence from lake sediments, pollen, and archeological records indicates that during, and since, the Tertiary Africa has been subject to a series of severe climatic oscillations. Again unlike those elsewhere, the African rain forests are characterized by a regular dry season. R. T. Moore also emphasizes the importance of the climatic oscillations, noting that R. E. Moreau postulated a long history of fragmentation and reduction in the case of these forests. Richards questions why, if Africa was subjected to a series of severe climatic shifts, Amazonia did not also suffer these. As yet little evidence has been developed one way or the other on this. Speciation patterns in contemporary Amazon birds and reptiles do, however, suggest temporary fragmentation of the rain forests during the Pleistocene, as is indicated by Haffer and by Vanzolini and Williams. (It is possible that the more central continental position of the Amazon forests and their greater extent could have been factors minimizing extinction in this biota. The Neotropical rain forest biota is, of course, also essentially a "double" one resulting from the late uniting of separate tropical North American and tropical South American ones, as Ernst Mayr has pointed out.)

The concluding chapters, on the ecology of aboriginal man and on the utilization of rain forest habitats, are interesting as much for what is not known as for what is known of these subjects. Interesting links are indicated between the food and cultural ecology of African pygmies and between Amazonian Indians and their habitats. On the other hand (to a biologist) it is depressing how purely descriptive and totally lacking in quantification this information is. One can but lament what a large proportion of anthropological work is limited to the cultural sphere and how different are the priorities of animal ecologists and anthropologists in data gathering. There is an urgent need for the initiation of a broad program to quantitatively investigate the ecology of primitive man relative to his natural environment before it is too late.

The chapters of H. Sioli and F. R. Fosberg are a sober warning against the dangers of misuse of the Amazonian rain forest habitats. In the seeming luxuriousness of the Amazon forests clearing and destructive agricultural practices continue at an undiminished rate. Humid tropical forest soils have only a low productive potential, however, owing to long-continued leaching and the rapid and complete decomposition of organic matter that occurs at their high temperatures. We still seem to be a long way from convincing politicians and the man in the street of this.

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Rare Earths and Magnetism

Magnetic Properties of Rare Earth Metals. R. J. ELLIOTT, Ed. Plenum, New York, 1972. x, 426 pp., illus. $28.

The rare earth metals occupy a unique and particularly interesting position in the study of magnetism and magnetic materials. Their magnetism originates from unpaired 4*f* electrons, which occupy localized atomic-like states even in metallic hosts, and the interaction between the spins occurs mainly via indirect processes involving the conduction electrons. Thus the electrons responsible for the magnetism and those involved in electrical transport are completely distinct. This separation, on the one hand, is responsible for the remarkable physical properties of rare earth metals, alloys, and compounds, and, on the other hand, simplifies considerably attempts at a microscopic understanding of these materials. By contrast, the transition metals, their alloys, and many of their compounds have proven remarkably intransigent to the most concerted attempts to understand their magnetic and transport properties.

This excellent book basically summarizes our experimental and theoretical knowledge of the rare earth metals and alloys up to 1971. It is composed of a set of review articles covering such subjects as the exotic magnetic structures exhibited by the rare earth metals, the concomitant bulk magnetic properties, the elementary magnetic excitations, transport properties, hyperfine interactions, band structures, indirect exchange, and crystal field effects. The authors are all scientists who have made important contributions to this area over the last decade. The articles are generally lucid, thorough, and authoritative. Indeed, my only serious criticism of the book is that there is rather little cross-referencing and that the basic physical ideas thus tend to be reintroduced in each chapter. This, however, seems to be a failing of many such edited books.

There are, of course, still many interesting and important properties of rare earths, particularly in metallic compounds, which to date have been explored only superficially and are poorly understood. Among these I might mention valence change effects, crystal fields, and anisotropic exchange interactions. Reliable empirical information on these has only appeared in the last three years.

This book should be an invaluable basic work for physicists and chemists who are interested in the properties of the rare earth metals and should in addition be useful for all workers concerned with magnetism and magnetic materials in general. Finally, the price of the book, though somewhat higher than I would have liked, is still within the reach of individuals who would like their own shelf copy.

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CMR Data and Methodology

Carbon-13 Nuclear Magnetic Resonance for Organic Chemists. GEORGE C. LEVY and GORDON L. NELSON. Wiley-Interscience, New York, 1972. xvi, 222 pp., illus. $9.95.

Carbon-13 NMR Spectroscopy. J. B. STOTHERS. Academic Press, New York, 1972. xii, 560 pp., illus. $24.

With the almost explosive growth of high-resolution carbon-13 magnetic resonance (CMR) spectroscopy in recent months there could be no better time for the publication of books in this field by Stothers and by Levy and Nelson. CMR has been long in reaching maturity owing to the problems of detecting a magnetic isotope of relatively low natural abundance (1.1 percent) and less than favorable magnetogyric ratio