worthy of emulation by other ecologists. However, the relentlessly dry writing style may deter all but wildlife biologists and the most determined loxodontaphiles from digesting the contents of the book. Laws was the best ecologist working in Africa during the 1960's, and on the basis of his wide knowledge I would have welcomed an intellectual excursion into elephant problems outside of the parochial confines of Bunyoro.

The elephants' destruction of their habitat was first recorded in 1930, the implications of this were realized in 1949, and the first action was taken in 1965—an impressive lag in time. Although some of the recommendations in this book were implemented in 1972, Laws *et al.* nevertheless note, "We regard the current situation as regards conservation in North Bunyoro as extremely unpromising." The situation at present is just as good. In fact, time may be running out on this and other elephant populations. With the price of ivory at an all-time high, the illegal trade in tusks often involves prominent government officials, making it virtually impossible to control poaching and manage herds effectively. Are most ecological studies in Africa destined to remain grand exercises in academic futility, the recommendations ignored by inert bureaucracies? *Elephants and Their Habitats* may ultimately stand as an impressive monument to a vanished opportunity.

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Boron

Boron Hydride Chemistry. EARL MUETTERTIES, Ed. Academic Press, New York, 1975. xii, 532 pp., illus. $49.50.

Boron hydride chemistry has an aura of the exotic, and its development has involved sophisticated laboratory techniques and advanced quantum mechanical calculations. "Sophisticated" and "advanced" are words used to justify military funding of the research, which in turn may explain why a CIA agent once asked this reviewer if he had learned of any Russian breakthroughs. No, the Americans are safely ahead, and the notion that boron hydrides could be used for rocket fuels has been extinct for some years. Although borax is cheap to mine, it is not really abundant, and the energy cost of converting it to boron hydrides is high. These compounds may find specialized uses, but the real reasons for studying them are their unique suitability for testing the foundations of chemical theory, especially bonding and stereochemistry, and the infinite variety of new structures that can be synthesized, their chemistry rivaling organic chemistry in complexity.

Theoretical fields can accommodate relatively few practitioners, and the 14 contributors to this book represent a substantial fraction of the active boron chemists. One of the highlights is the chapter by Lipscomb, the master of advanced molecular orbital calculations, which describes his results in terms sophisticated enough for quantum mechanical experts and clear enough for ordinary chemists. Boron is particularly appropriate for such studies because the small number of electrons and the high symmetry of many of its compounds make detailed quantum mechanical calculations possible, and theoretical predictions can sometimes be made in advance of experimental verification, which is not often possible in the more developed branches of chemistry. The findings are relevant to other fields, and organic chemists confused by the controversy surrounding three-center bonding in elusive carbonium ion intermediates might note that "the three-center bond is alive and well, and residing in the laboratories of boron chemists."

Another highlight is the chapter on carborane complexes of transition metals by Dunks and Hawthorne. Hawthorne's unusually creative chemistry has led to a variety of novel cage structures, unusual oxidation states of transition metals, metal-metal bonding, and cage rearrangements. The coverage is not complete, since it omits much of Grimes's work on smaller carborane complexes of transition metals and Hawthorne's own work on α-bonded transition metal complexes of biscarborane, plus much very recent work by Hawthorne's group. Other chapters cover *nido* and *arachno* boron hydrides, *closo* boron hydrides, icosahedral carboranes, smaller carboranes, *nido* heteroboranes, and gas phase reactions of borane, BH_3, a short-lived intermediate involved in many contractions and expansions of boron cages.

The foregoing topics would constitute a coherent book, but they are interrupted in the middle by chapters on hydroboration, boron cations, and borazines, which belong to a different and more conventional sort of chemistry. Pasto's brief review of hydroboration with emphasis on mechanistic studies is a useful independent article, but true coverage of hydroboration and its significance to organic synthesis would require several long chapters by H. C. Brown or his students, which are conspicuous by their absence, and Brown has published his own books.

In summary, this is a useful reference on a number of topics in boron hydride chemistry, suitable for expanding the horizons of any inorganic, theoretical, or organic chemist interested in the fundamentals of chemical bonding and structure.

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