Book Review

Absorption and Malabsorption of Mineral Nutrients (Current Topics in Nutrition and Diseases, vol. 12), Noel W. Solomons and Irwin H. Rosenberg, eds.

New York: Alan R. Liss, Inc., 1984, 314 pp., bound, illustrated, $66.00.

This addition to the Current Topics in Nutrition and Disease series is a remarkable *tour de force* in an area burgeoning with new knowledge. The editors have prefaced the contributions of others with a chapter on normal and abnormal mechanisms on mineral absorption, an area frequently neglected in several descriptive reviews. This chapter, by I. H. Rosenberg and N. W. Solomons, bridges the gap between the physiology of inorganic element transport and nutritional requirements, bioavailability and utilization. This section is an important first step for the understanding of the complexities of absorptive mechanisms of nutritionally important minerals.

A thorough review of the information available on major inorganic nutrients such as calcium, magnesium, zinc and iron covers mechanisms of intestinal absorption, dietary, environmental and physiological factors, and alterations of mineral absorption. For calcium, M. W. Weiser gives a concise presentation of the biochemical interactions between vitamin D metabolism and calcium absorption. Particularly interesting is the description of molecular control mechanisms involved in the absorption of this element. A good portion of the review deals with methods of measuring the uptake of calcium at various human chronological ages, in health and in disease. J. Bengoa and R. Wood provide updated information on magnesium, an element whose absorption and excretion can be severerly affected in human disease, especially conditions affecting the gastrointestinal tract and the kidney. For iron absorption, the wealth of information available, some of which is now dated, required a significant organizational effort. Of special interest to the nutritionist and the clinician are the sections dealing with modifiers of iron absorption and evaluation of pathologic conditions affecting the absorption of this element. Also, S. R. Lynch described techniques of iron absorption measurement, dietary factors affecting bioavailability of iron and other therapeutic considerations.

An encompassing review of zinc absorption and malabsorption written by N. W. Solomons and R. J. Cousins ranges from the physiological aspects of intestinal uptake to the pathological causes of zinc malabsorption and approaches to zinc replacement therapy. These contributors have prepared an exhaustive review of the subject and made sense of findings which are not infrequently contradictory. The explosive growth of research on this element since 1963 is probably unparalleled in nutrition. Attempting the present to the reader a general, but not superficial, overview of this topic is a task for which the authors deserve credit.

Copper nutritional requirements and the biological role of this element are still being clarified, although in this case we are dealing with an element for which the pathological manifestations of congenital and acquired deficiencies have been well described. The former are particularly interesting, since the existence of mouse mutants with an X-linked inheritance similar to that described in Menkes' disease, in humans, may help to achieve a better understanding and eventual treatment of a lethal genetic condition. L. H. Allen and N. W. Solomons' review follows the general

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outline of other chapters and again provides a well-balanced presentation of physiological findings and therapeutic considerations.

The recognition of the importance of selenium in human nutrition is another recent focal point of scientific interest. The review by G. O. Barbezat and associates puts together the relationship between an enzymatic biological marker, such as glutathione peroxidase activity, and selenium concentration. The authors have conducted key absorption studies with patients in an area of low selenium availability (South Island of New Zealand), studies that provide the most reliable data on humans with a deficiency in this element. Another selenium-responsive condition described in China, Keshan disease, appears to be associated with additional etiologic agents. The authors also make clear that claims linking selenium to many real or imagined diseases have not received scientific substantiation.

The review on chromium was written by W. Mertz, who has played a pivotal role in the understanding of the importance of this element, particularly as an ingredient of the "glucose tolerance factor." However, much less is known about the absorption of chromium, which as a trivalent cation penetrates the intestinal mucosa very poorly, and is therefore used as a fecal marker. For chromium, naturally occurring chelates may provide far higher bioavailability than inorganic salts and represent an additional case in which dietary components, or natural mucosal turnover products, play a role in mineral absorption.

N. W. Solomons also undertook brief reviews of other trace elements of nutritional significance: manganese, molybdenum, vanadium, nickel, silicon and arsenic. These minerals range from those for which a biological role could clearly be agreed to (the first three), to those whose presence in human diets is unavoidable due to contamination from raw sources and which still require further justification for their essentiality.

An aggregate of over 1,600 references makes this volume not only a clearly written, well-edited and organized book, but also a valuable source of bibliographical information for the student, the investigator and the practitioner.

Reviewed by

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