Another group of scientists, largely physicists, measure magnetic properties of transition metal compounds because they are interested in the physical processes that are involved and in the identification of real systems that exhibit properties predicted by various theoretical models. Using information gained from careful and precise studies, theories of magnetic systems are refined, and the powers and limitations of the theories are identified and understood. Often, directions for new investigations become apparent from the analysis of the compatibility of theory and experiment.

Somewhere in the middle, there are a large number of scientists—mostly inorganic chemists with some physical chemists—who are fascinated by the magnetic properties themselves and who want to find out how changes in chemical functionality and structural details affect the properties. The present book is apparently intended for this group. The authors have been stimulated by the excellent review article on magnetic ordering phenomena by L. J. de Jongh and A. R. Miedema (*Adv. Phys.* **23**, 1 [1974]) and have borrowed liberally from it, often adding information about elementary, basic developments that is judged to be necessary for chemists. In directing attention to this review, the authors aim "to point the way that . . . the science of magnetochemistry should be going"; they state that "it is no longer tenable to write only about such subjects as distinguishing stereochemistry from the measurement of a magnetic susceptibility [sic] over a restricted temperature region; that is, paramagnetism is so well-understood that little remains to explore which is of fundamental interest." This statement is difficult to reconcile with their statement early in the first chapter that "paramagnets are the subject of this book." In fact, paramagnetism is dealt with at length only in parts of four chapters; the other four chapters are devoted to dimers and clusters, long-range order, short-range order, spin-flop processes, metamagnetism, ferrimagnetism, and canting. Except for the chapter on dimers and clusters, which is too brief to be very useful but whose subject has been treated in detail in a number of other places, these chapters will serve a good purpose as a guide to the de Jongh and Miedema review. Considerable attention is also paid to selected examples; much of the material in these chapters is drawn from the authors' own research. It should be noted that very recent reports have called in question some aspects of this work.

There are a few slips that will be troublesome for the uninitiated. For example, the term 1/3 S(S + 1) in the Hamiltonian of equation 3.2 is omitted when the data are plotted, incorrect magnetic ordering is ascribed to at least two systems, operators are mistaken for quantum numbers, and the section on temperature-independent paramagnetism is abbreviated in such a manner that it is impossible to accept as written. Considerable effort is expended in developing a crystal field theory, and then the effort is dismissed in the discussion of the properties of titanium(III) with the statement that such calculations "are useful pedagogical devices but bear little relationship to the true nature of the problem." One might have expected the gauntlet, once thrown down, to have been picked up and this important problem to have been set straight. Such is not the case, and the reader is left to learn the details of the quasi-quartet state that arises in $Ti(III):CsAl(SO_4)_2 \cdot 12H_2O$ by himself or herself. For me, that meant a trip to the library and some reasonably extensive work; if other readers of this book are stimulated in this manner, then I think the authors' goal will have been achieved.

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Immunohematology

Human Blood Groups. Proceedings of a meeting, Buffalo, N.Y., June 1976. J. F. MOHN, R. W. PLUNKETT, R. K. CUNNINGHAM, and R. M. LAMBERT, Eds. Karger, Basel, 1977. xii, 462 pp., illus. $46.75.

Human blood group research, like other fields of science that have undergone phenomenal expansion, has changed direction and leadership. The field burgeoned in the 1940's, held its ground in the 1950's, and has been characterized by changing perspectives ever since. Current interests are clearly visible in this collection of 46 papers, which, although entitled *Human Blood Groups*, differs radically in subject emphasis from the standard Race and Sanger book *Blood Groups in Man*. This is neither good nor bad; it only reflects what has happened to the field. Today working blood banks struggle with their daily tasks to such a degree that they can no longer be oriented toward basic science, and the disciplines of human gentics, physical anthropology, and forensics no longer depend heavily on red cell blood types for a data base. A reader will search this book in vain for specific discussion of problems related to transfusion medicine and erythroblastosis. The collection is largely concerned with basic science.

Where is the scientific action in human blood group studies? The most concerted activity has been directed toward elucidation of the structures of glycosphingolipid erythrocytic antigens, and this collection contains good short reports on the subject from D. M. Marcus *et al.*, J. Kościelak, D. A. Zopf *et al.*, and S. Hakomori *et al.* The major erythrocytic glycoprotein has been much more difficult to analyze; the status of efforts to do so, as of 1976, is described by V. T. Marchesi *et al.* Novel antigenic features are discussed by Elwira Lisowska and Maria Kordowicz, who identified specific M and N gene-determined xenoantigens in both desialized and Smith-degraded peptides. None of the other red cell antigens has been chemically defined as yet. D. J. Lorusso *et al.* give an account of their somewhat meager progress in attempting to isolate the Rh antigen. Although the Duffy antigen has not been isolated either, its remarkable relation to erythrocytic malaria receptors, discussed by L. H. Miller *et al.*, is an excellent illustration of the influence of environmental pressure (malaria) on the incidence of a blood group phenotype (Duffy-null is common in Africa).

Old-time blood group serology has not disappeared, and this collection contains some typical reports. But it also contains a chapter by A. E. Szulman on the immunofluorescent localization of A, B, and H in tissues and one by M. Fellous *et al.* on their excellent cell hybridization studies showing that P1, P2, and P^k are not allelic products, a conclusion in confirmation of the earlier views of Marcus, who identified the structures of the different glycosphingolipids that carry these antigens. The volume, however, pays inadequate attention to erythrocytic membranes and the role of mechanoproteins in preserving erythrocytic structure and antigenicity. And, although S. Seidl *et al.* report on the erythrocytic defects associated with Rh_{null} and Rh_{mod}, there is no mention of the acanthocytic changes associated with the McLeod phenotype in the Kell system and the relationship of this to sex-linked chronic granulomatous disease.

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