# Book Reviews

## Chondrites

**Carbonaceous Meteorites.** BARTHOLOMEW NAGY. Elsevier, New York, 1975. xiv, 748 pp., illus. $80.95. Developments in Solar System and Space Science, 1.

Early in 1961, when I was curator of the meteorite collection at the American Museum of Natural History, I was visited by Bartholomew Nagy, then of Fordham University. He described his researches in petroleum geochemistry, and his desire to apply this expertise to the investigation of the poorly known organic compounds in carbonaceous meteorites. I supplied him with material from the Orgueil meteorite, hence the present book.

The initial results of Nagy's investigation were presented at a meeting of the New York Academy of Sciences on 16 March 1961, and published under the title "Mass spectroscopic analysis of the Orgueil meteorite: evidence for biogenic hydrocarbons," by B. Nagy, W. G. Meinschein, and D. J. Hennessy. Wider circulation was provided by an article in *Life* by D. Bergamini entitled "Wax and wigglers: life in space?" At that point Edward Anders of the University of Chicago remarked that, in his opinion, "the only connection between meteorites and life is that an article on meteorites appeared in a magazine called *Life*." It might be said that the fat (or wax) was now in the fire. The articles and the reply ignited a hot controversy that has been fueled by contributions and polemics from chemists, physicists, astronomers, geologists, biologists, and mineralogists and has elicited the active participation of two Nobel laureates, Harold Urey (who has contributed a foreword to this book) and Melvin Calvin. The controversy resulted in an enormous increase in our knowledge of these remarkable meteorites. All this is reported in exhaustive (and sometimes exhausting) detail in Nagy's book.

The book has five chapters—"Meteorites: classification, composition, ages, falls and origin" (42 pp.); "Historical information regarding carbonaceous meteorites" (35 pp.); "Chemical composition, mineralogy and petrology of carbonaceous meteorites" (201 pp.); "The carbon compounds in carbonaceous meteorites" (329 pp.); and "Microstructures in carbonaceous meteorites (organized elements)" (81 pp.). Each chapter is accompanied by a glossary and a list of references, each very comprehensive; for example, for chapter 4 the glossary occupies 79 pages and the references 17 pages (approximately 400 entries). The literature is thoroughly documented up to the date of the preface (March 1973). Subject and reference indexes are excellent.

In his preface Nagy writes, "The purpose of this book is simply to document available data which until now were scattered in articles published in a great variety of journals. It is *not* the purpose of this book to evaluate the validity of reported findings and theories—the reader will have to do this to his own satisfaction." Judged by this statement the book succeeds admirably; Nagy has covered all the literature I am aware of and much that I have not read. I think he has presented this material, much of it controversial, fairly and objectively. I noted a number of errors and possible misstatements; most of these are innocuous, but some can be seriously misleading (for example, on p. 96 the concentration of iodine in the Murray meteorite is reported in parts per million whereas it should be parts per billion). A major difficulty in writing a book like this is making it appropriate for the diverse readership it is hoped to serve. For the student, the elementary information is most useful but the extensive detail may be wearisome, whereas for the specialist the elementary information is unneeded but the thorough documentation most welcome. I regret Nagy's decision not to provide some evaluation of theories and findings and deplore his statement that "the reader will have to decide for himself how to interpret the results of the organic analyses" (p. 281). Since this field is Nagy's specialty, one might reasonably expect some guidance from him. Nevertheless, in spite of these shortcomings, the book is a valuable contribution. It fittingly summarizes an enormous mass of information on these remarkable meteorites and provides a solid platform on which to base future research.

BRIAN MASON
*Department of Mineral Sciences, Smithsonian Institution, Washington, D.C.*

## The Mott Transition

**Metal-Insulator Transitions.** N. F. MOTT. Taylor and Francis, London, and Barnes and Noble, New York, 1974, xvi, 278 pp., illus. $22.50.

A large variety of systems in the condensed state, mostly solids but also some liquids, undergo, as a function of temperature, pressure, concentration, degree of ordering, or other parameters, transitions from a nonconducting or poorly conducting state to a strongly conducting or metallic state. A spectacular example of this behavior occurs in vanadium sesquioxide, which, at atmospheric pressure and as a function of temperature, undergoes at about 168°K a transition in which the conductivity changes by more than six orders of magnitude, from that of a fairly good conductor at high temperatures to that of a fairly good insulator below the transition temperature.

The systems that exhibit these properties are diverse, and the conditions in which the transition takes place are many and very different. To name a few, metal-insulator transitions are exhibited by transition-metal compounds, rare-earth compounds, doped semiconductors, alloys and metals, and metal-ammonia solutions. These systems also include antiferromagnets, ferrimagnets, and ferromagnets, as well as ordinary diamagnets and paramagnets.

In the 1975 jargon of the solid state physicist, the generic name for metal-insulator transition is the Mott transition. This is due to the important contributions that the author of the book under review has made to understanding its mechanisms. Mott's original publications span 40 years of theoretical research, and his ideas have dominated the field and influenced and stimulated a large number of researchers. The field is not, however, a very coherent one. The variety of substances that exhibit the phenomenon, as well as the many different contributions made to the basic theory and the very many mechanisms proposed to explain the various aspects of the transition, do not constitute a closely knit and tidy subject.

As a consequence, the present monograph lacks the coherence and finality that could make it the fundamental and definitive contribution to the literature of the field. It should be considered an extensive and well-researched review article. As such, it describes in a clear way a very large amount of experimental information on the many aspects, properties, and details of the phenomena related to the main subject. Most of this information is included in figures and graphs, and the absence of data in tabular form is more than compensated for by the extensive list of