tions. Some of the papers deal with this subject as well as with attempts to rationalize the unusual properties of these phospholipids in terms of structure. It would appear, however, that models created to visualize a specific role for these compounds in membranes have to be considered premature.

Good progress has been made in understanding the steps in the biosynthesis of myoinositol from D-glucose-6-phosphate, and this subject has entered the stage at which sophisticated questions concerning the exact mechanism of the cyclase reaction are being answered through the study of isotope effects. It is of interest that the myoinositol-1-phosphate formed in the cyclase reaction is the enantiomorph of that found in the phosphatidylmyoinositol. Thus, living cells hydrolyze the L-myoinositol-1-phosphate formed in the cyclase reaction to free myoinositol (the first irreversible step in myoinositol biosynthesis) and then convert the free myoinositol to 1-phosphatidyl-D-myoinositol, a process that is mechanistically quite distinct from that for the biosynthesis of phosphatidylcholine. Perhaps this can be rationalized in terms of the biosynthetic control of the pathway leading to myoinositol. That myoinositol should also be cleaved oxidatively to glucuronic acid, which may serve as a precursor of plant cell wall polysaccharides, adds a further puzzling note.

Myoinositol is the precursor of several isomeric inositols and their methyl ethers, as well as of aminoinositols and *C*-methyl-inositols, in reactions that are becoming fairly well defined. Functional roles for most of these substances are unknown, although a diaminoinositol is involved in the biosynthesis of the antibiotic streptomycin. An unusual role in hexose transfer has been indicated for galactinol, a D-galactoside of myoinositol. Myoinositol glycosides esterified with indole-3-acetic acid may have a function in plant growth regulation.

As with other fields of science, significant advances in inositol chemistry have followed on the development of new methods of separation and characterization. Ion-exchange separation of inositol polyphosphates coupled with characterization by nuclear magnetic resonance spectroscopy has led to the identification of all possible myoinositol pentaphosphate isomers, an accomplishment I would have thought improbable only a few years ago.

As noted in the conference summary, treatment of the subject of the mannophosphoinositides of *Mycobacteria* and closely related organisms is lacking as is, I might add, any discussion of the myoinositol sphingolipids found in plant seeds and yeast. As further evidence of the surprises that await anyone working in the field, I refer to the diacylmyoinositol mannoside found only last year in several *Propionibacterium* species.

If I wanted to get a good idea of the direction of inositol research today I would start with this volume. It is timely, authoritative, and succinct, and it should be an important reference source for both research and graduate teaching on this subject.

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Geophysics

The Application of Modern Physics to the Earth and Planetary Interiors. A NATO Advanced Study Institute, Newcastle upon Tyne, England, March-April 1967. S. K. RUNCORN, Ed. Wiley-Interscience, New York, 1969. xvi + 692 pp., illus. $35.

Geophysicists are troubled by the problem of demonstrating the uniqueness of their models of planetary interiors derived from the inversion of geophysical data. This difficulty stems from the lack of a complete data set, from the use of imprecise data, and from the absence of a general theory establishing the basis for unique inversions. Under these circumstances there is a growing tendency to draw on modern physics in order to establish additional constraints on solutions. The modern theory of solids, the theory of semiconduction, experimental data from shock studies of solids, the theory of creep, and the mathematics of magnetohydrodynamics have been invoked to eliminate some models and to strengthen the case for others. It is a credit to Runcorn and his colleagues that they have drawn together many of the recent developments in a single volume.

The book is a collection of papers on diverse subjects connected by the central theme—applicability to planetary interiors. About two-thirds of the 48 papers are reviews, and of some pedagogical value; the remainder contain original contributions. The book is divided into major sections as follows: Cosmology and Geophysics; Solid State Physics and Geophysics; High-Pressure Physics and the Earth's Interior; Developments in Techniques; Magnetohydrodynamics; The Earth as a Fundamental Physics Laboratory. L. Rosenfeld contributes an instructive and engrossing opening chapter discussing the place of planetary physics in the history of science.

The hazards of publishing a collection of papers inspired by a conference are well known—and some are not escaped by this book. Several techniques proposed in 1967 have not panned out, and other articles have been superseded by recent events such as the landings of Apollos 11 and 12. Several of the papers would be more appropriate for specialized journals. A few papers which could be highly significant appear only as abstracts. More than 100 pages are devoted to the elusive question of secular changes of g and its geophysical consequences.

The great strength of the book rests in the dozen or so papers which will be of lasting value as reviews or important original contributions. Among these are W. Elsasser's piece where he introduces the concept of the lithospheric stressguide as a component of his mechanism of sea floor spreading. The papers by T. J. Shankland and R. G. Burns contribute new data on the electrical and optical properties of silicate minerals which are highly pertinent to the interpretation of electrical conductivity in the mantle and in the construction of thermal models of planetary interiors. T. J. Ahrens and C. F. Petersen present an excellent review of methods of reducing shockwave data. New results on the elastic properties of oxide compounds are compared to seismological data in the paper by O. L. Anderson and R. C. Lieberman. J. J. Gilvarry's extensive discussion of the Thomas-Fermi atomic model will become a standard reference for specialists concerned with the equation of state in the central regions of planets.

This book is another example of how the Advanced Study Institutes organized by Runcorn and his colleagues at the University of Newcastle have produced a number of important volumes which reflect good taste in the choice of important, forefront themes and in the selection of capable and stimulating participants.

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