kelp-strewn beaches, the interminable rain, fog, and mystery.

Though Steller was to spend only 10 hours on the Alaska mainland, he discovered a host of new plants and animals. Linnaeus called him a born collector "who has earned great and precious glory." He is remembered best for Steller's jay and the extinct Steller's sea cow (the giant northern manatee), but many other animals bear his name —the legendary white raven, the eagle, the greenling rock trout, the eider, and the sea monkey (which no one else has seen). Places along the route of travel also commemorate him—Steller's Hill, Steller's Mountain, and Steller's Arch. Following Bering's expedition with its news of sea otters, seals, and other treasures, a wild stampede occurred far greater than the Klondike Gold Rush, and so began a carnage that brought not only animal species but even the native people almost to extinction.

"This is," as Frank Defresne says in his foreword, "more than a thrilling adventure story. It is a vivid word picture of Alaska's pioneer naturalist and what he observed. It is a solid contribution to American natural history as well as an important restoration of our nation's neglected past." Scientists and historians should not overlook this book. Those who love Alaska and the Aleutians will treasure it.

SIGURD F. OLSON

Ely, Minnesota

Magnetofluidmechanics

The Electromagnetodynamics of Fluids. W. F. HUGHES and F. J. YOUNG. Wiley, New York, 1966. 662 pp., illus. $17.50.

In the last decade magnetohydrodynamics and plasma physics have emerged to form an important branch of science. *The Electromagnetodynamics of Fluids* is a text for a graduate course or for the professional engineer who wishes to acquaint himself with the continuum or fluid aspects of this field.

After reviewing the principles of special relativity, the authors treat the electrodynamics of moving media and work several examples in detail to illustrate how to apply the principles. The electromagnetic body force in a fluid medium is introduced and the electromagnetic stress tensor formulated. After showing how the fluid equations of hydrodynamics are modified by electromagnetic effects, Hughes and Young discuss the assumptions which are made in reducing to the usual magnetohydrodynamic approximation. This material, which comprises a fourth of the book, provides a good treatment of the basic principles of magnetofluidmechanics. The remainder of the book consists of applications to viscous magnetohydrodynamic flow, both steady and transient or alternating, plane waves in unbounded and bounded fluids, discontinuities and shocks, and magnetoaerodynamics. Many excellent problems are presented.

The book's coverage seems somewhat uneven. In some areas considerable detail is presented. Expansion would be desirable in other places, such as the discussions of discontinuities and shock waves. In many places the authors repeat themselves unnecessarily. Equations are often written several times with only minor changes or in component form. Obvious vector identities could have been eliminated. With only a modest amount of effort the book could have been shortened considerably without sacrificing clarity. There are too many typographic errors for so expensive a book.

JOHN L. JOHNSON

Westinghouse Research Laboratories and Plasma Physics Laboratory, Princeton University, Princeton, New Jersey

Quantum Theory and Mathematics

Theory of Groups in Classical and Quantum Physics. Vol. 1, Mathematical Structures and the Foundations of Quantum Theory. THÉO KAHAN. Translated from the French edition (Paris, 1960) by H. Ingram. A. R. Edmonds, Translation Ed. Elsevier, New York, 1966. 590 pp., illus. $37.50.

Investigations of the structure of fundamental particles have demonstrated, more convincingly than before, that the theory of group representations is a powerful tool in the study of quantum systems [see, for example, *Science* **152**, 1048 (1966)]. The theory has been found to be indispensable for describing intricate symmetries and the so-called "quantum numbers" that characterize various states of a quantum mechanical system. Such a group-theoretical description could be termed "global," for the internal properties of the system may not be known in detail. More recently, the theory of group representations is being used in an elegant manner to provide us with a complete dynamical framework for quantum theory. The present state of research in theoretical physics indicates that some modern algebraic theories—noncompact groups, general associative algebras, and so on —that until recently were thought to be too abstract to be useful in physics will play an essential role in the developments of the near future. It is remarkable that since the beginning of theoretical physics every major new step had its own distinct mathematical discipline from which it is inseparable, as though each new level of natural philosophy requires a new language. From the infinitesimal calculus and ordinary differential equations in Newtonian mechanics, to partial differential equations in Maxwellian field theory, to linear algebra and operators in Hilbert space in the quantum mechanics of Heisenberg and Dirac, to the theory of functions of complex variables in *S*-matrix theory, the mathematics has been not merely a tool but fundamentally interwoven with the physical concepts. One then rightly wonders about the relationship of mathematical invention and physical theory and asks whether we are perhaps coming closer to the idea of Plato that the ultimate of matter is nothing but geometric forms.

The book reviewed here, which was written by Kahan in collaboration with P. Cavaillès, R. Gouvarné, T. D. Newton, G. Rideau, G. Lochak, and R. Nataf, is perhaps the most extensive book in the field. It is repetitious and lacks unity and coherence, but these faults may be an advantage for those who have time to go through the book, in that they will be able to study the same things described from different points of view. Thus, in Part 1, Theory of Groups and Axiomatized Mathematics for the Use of Physicists, and Part 3, Theory of Abstract Groups, the mathematical concepts are discussed in detail from the physicist's and the mathematician's point of view, respectively. Part 2, by Newton, deals with the important inhomogeneous