research trends. Although it is not a textbook, nor so intended, many chapters will nicely supplement existing text material, and some chapters will serve better in this capacity than the previously available material. The broad and rapidly expanding field of oceanography cannot be covered in a few volumes—and perhaps not even adequately sampled. The distinction between what should and what should not be included is an individual's choice, and there are probably as many different opinions about this matter as there are scientists concerned with the sea.

The subject matter of volume 2 (24 chapters by 29 authors) ranges from the chemistry of the sea through productivity, food chain relations, descriptions of current systems and regional oceanography to the bathyscaph as a research instrument. Biology is restricted to aspects rather directly related to the physical, chemical, and geological processes in the ocean and on its floor. Some chapters give a thorough and stimulating treatment of selected topics and others barely an introduction.

The index is not cross referenced to the other volumes in the series. Each volume, and to a considerable extent each chapter, stands alone. Some authors refer to chapters in the other volumes, and others probably could have improved the presentation of their subject, and the book, by better awareness of related material included in the series. The reader may be left with more of a feeling for the chapters as entities than for the sea as a whole.

Despite the lack of continuity and the unavoidable gaps in any work of this type, the *Composition of Sea Water* will be very useful to researchers in contributing disciplines. For the topics covered, the volume will serve not only as an entry into the very scattered literature of the field, but, for some topics, it will also serve as an abbreviated monograph. In keeping with the times, its cost is high; the price, combined with the volume's incompleteness for specific text usage, may unfortunately limit its distribution among the many students who should have it readily at hand. The editor and his staff deserve the thanks of the oceanographic community. Unfortunately, the proof copy available for my inspection contained numerous typographical errors which I trust will be eliminated in the finished volume.

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Solar-Terrestrial Phenomena

Physique Solaire et Géophysique. A. Dauvillier. Masson, Paris, 1962. iv + 362 pp. Illus. NF. 72.

In this 362-page book Dauvillier allows his imagination to roam freely over what is frequently called solar-terrestrial phenomena. On a level which may be suitable for graduate students and with a historical perspective rare in modern books, the author elucidates the solar surface, solar magnetism, the solar corona, the zodiacal light, and various terrestrial phenomena of solar origin. On the whole, these factual résumés are authoritative, but there are occasional omissions of important material. For example, the solar chromosphere is described without reference to any work carried out since 1945; and the modern student will be somewhat surprised to learn that "As one goes from the exterior towards the photosphere the outer layers of the sun show, in effect, first the presence of hydrogen, then of helium, then of light metals, with the heavy elements being confined to the deepest layers. The case of calcium, which is observed in the highest regions of the chromosphere, is special since the ions of Ca^+ are ejected by radiation pressure."

Readers will find the interpretative chapters that follow each résumé most challenging. In these the author integrates the factual material into a theoretical whole. Some of his major conclusions are best illustrated by the following direct quotations (my translations).

On solar magnetism: "To take account of solar magnetism we appeal not to electrostatics, not to induction, but to thermoelectricity. The thermoelectric currents engendered in the photospheric material have the properties of an electric arc and their incurvation under the action of appropriate magnetic forces brings about the magnetic field. The problem is considered as a simple problem of electrotechnique."

On solar granulation: "The photospheric granulation is considered as an electric discharge of the nature of an arc. The isothermal layer where neutral atomic hydrogen meets with thermoionization is the site of an electronic pressure which is directed towards the surface and which constitutes a thermoelectric generator of the type of the indirectly heated cathodic arc studied by Medicus and Wehner."

On sunspots: "Sunspots arise not from thermal convection nor from magnetohydrodynamic effects (dynamo effect) postulated by Gouy and numerous other authors. Their properties are those of a Davy electric arc burning in a gas."

On the zodiacal light: "The theories based on the role of cosmic dust and of interplanetary gas are discussed and discarded for the same reason as those relevant to the corona. The feeble contribution caused by the interplanetary gas has been evaluated. Only the electronic theory is adequate to take account of the daily variations of the zodiacal light. The latter appears to be the necessary intermediary in the electromagnetic relations that exist between the sun and the earth."

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Structural Theory

Chemical Bonding and the Geometry of Molecules. George E. Ryschkewitsch. Reinhold, New York; Chapman and Hall, London, 1963. x + 116 pp. Illus. Paper, $1.95.

In four chapters of nearly equal length, the author of this paperback covers the electronic structure of atoms, ionic compounds, the covalent bond, and the geometry of molecules. He aims to present modern structural theory in a qualitative way without rigorous proof. His treatment is up-to-date, and a good selection of outside readings is provided. The book makes instructive and interesting reading for one who already has a sound knowledge of fundamental chemistry and physics.

The level of sophistication is high. Among the advanced concepts introduced are the Hund Rule, lanthanide contraction, lattice energy, coordination number and radius ratios, the Madelung constant, the Born-Haber cycle, formal charge, electronegativity, dipole moment, resonance, and delocalization energy. All in 107 pages! The style is concise and clear, but I frequently felt that a good deal of additional exposition by lecture would be required to provide undergraduate chemistry students with a grasp of many of the topics.

The author is to be congratulated for avoiding oversimplification. He is careful to point out limitations to the