number of genera listed increases from 341 to 568 [*sic*], nearly one-sixth of the increase being Delesseriaceae, favorite subjects of study with Kylin. One hears all too often of major pieces of work abandoned on the death of the author because they were too incomplete to be published or because loyal friends were lacking. This book is a fine memorial to Kylin and to his widow's unflagging devotion.

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Physics and Chemistry of the Earth. vol. 1. L. H. Ahrens, Kalervo Rankama, and S. K. Runcorn, Eds. McGraw-Hill, New York; Pergamon, London, 1956. 317 pp. Illus. $8.

The continuing flood of scientific and technical papers requires the condensing of data and interpretations into manageable units so that the individual can maintain a broad acquaintance with science while keeping abreast of the advances in his own field of specialization. One device is the article that reviews the significant contributions whenever work in a particular field has progressed to the point that a retrospective evaluation is useful to the specialist and informative to scientists generally.

Pergamon Press and McGraw-Hill Book Company have embarked on producing annually as part of the "Progress Series" a volume on *Physics and Chemistry of the Earth.* The intent is to interest physicists and chemists in problems of our planet as well as to inform geologists of the state of knowledge in geophysics and geochemistry. The first volume is certain to succeed because of the emphasis on well-formulated statements backed by quantitative data, rigorous logic, and critical estimates of the probable validity. By the same token, the mathematics may repel a few who find the terms *very rare* to *abundant* sufficiently quantitative for all purposes.

The contents at first glance may give the reader the fleeting impression that six or seven out of the eight reviews deal with topics that have been bandied about at numerous conferences, symposia, and special sessions during the last 5 years: origin of the solar system, temperatures within the earth, radioactive methods for determining geologic age, seismology and the broad structure of the earth's interior, hydrodynamics of the earth's core, investigations under hydrothermal conditions, geochemistry of the halogens, and geochemistry in the U.S.S.R. Closer inspection immediately shows that the articles contain the basic information that a nonspecialist needs in order to profit from the papers and discussions at the various meetings. The specialist may disagree with the picture drawn, but he may well benefit from the critical appraisal made by a colleague of acknowledged competence.

Spencer-Jones traces the development of thought on the origin of the solar system by concise statement of the basis of each idea, the physical or chemical problem it is designed to meet, and the specific shortcomings that lead to its modification or abandonment. He suggests that theories premised on the cataclysmic interaction between the sun and another celestial body are less likely to succeed than theories premised on evolution from a solar nebula.

Verhoogen examines the methods used for deducing temperatures within the earth and inferring the sources of heat. He concludes that estimates based on assumptions about convection are preferable to those based on assumptions about conduction, but that it remains to be proved that convection does occur in the mantle. Studies of electric conductivity show promise for determining temperatures.

Ahrens gives the principal methods for determining geologic ages, with considerable emphasis on the problems and uncertainties, and points out potential methods that have not yet been exploited. Brief statements on meteorites and tektites are included, and the article concludes with references on methods not discussed: He, Ra, Io, photographic emulsions, cube edge, and radiation damage.

Bullen introduces seismology and then considers the broad structure of the earth's interior. Seven zones make up an earth idealized as a perfectly elastic, isotropic body; two earth models are presented. Bullen postulates that density distribution favors model B, the outer core is a high-pressure modification of the lower mantle, and the inner core is chemically distinct from the outer core.

Hide shows that the earth's magnetic field is due to circulating electric currents probably generated by hydrodynamical motion of the liquid conducting core; hence, a theory on magnetism is dependent on a theory of core hydrodynamics. Driving energy for the dynamo may come from precession, Urey's "sedimentation," and radioactive heating.

Roy and Tuttle review the post-1913 history of investigations under hydrothermal conditions, the most effective apparatus devised, and the results of mineral synthesis, phase equilibria, and liquidus studies. The data permit broader concepts of mineral and rock stability, of the development of very high pressures during crystallization in systems containing volatiles, and of the importance of alkalies to the solubility of water in a granite liquid.

Correns brings together a great mass of information on the geochemistry of the halogens, but the myriad gaps underscore his contention that geochemical preoccupation with cations has been matched by neglect of anions. The data are arranged in geologic order, ranging from cosmos and meteorites, through various rock groups, to hydrosphere and atmosphere, and concludes with a brief balance: fluorine originates principally from magmatic rocks, while iodine, bromine, and chlorine must come from the volatile phase of magma—unless the primitive ocean and/or atmosphere were rich in halogens. Of particular interest are the indications of worthy lines for future study.

Tomkieff summarizes the literature in Russian on geochemistry for the period 1948–53. The article as a whole is not easy reading but constitutes a compact guide to subjects and authors in six fields: geochemistry, geospheres, elements; minerals; mineral deposits; igneous rocks; sedimentary rocks; natural waters and evaporates. Each section carries its own references in addition to general author and subject indexes; the latter should not be confused with the name and subject indexes for the entire volume.

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Chemistry of Chromium and Its Compounds. vol. I of *Chromium.* Marvin J. Udy, Ed. Reinhold, New York; Chapman & Hall, London, 1956. 433 pp. Illus. $11.

The value of a book such as this is immediately apparent when one considers that this volume, along with its companion volume II, covers all phases of the manufacture and uses of chromium metal, chromium alloys, and chromium chemicals as well as the chemical and physical properties. As the editor points out in the preface, no one person in this day could be expected to be sufficiently conversant with all phases of the science and technology of chromium to write such a book. This one is the work of 36 different and distinguished authors. It follows that no one reviewer could be sufficiently conversant with all phases of the subject covered to be able to give a really critical review of the book. Therefore, we must be content with the general impressions as they appear to me.

The 15 chapters in this volume are arranged in logical order and seem to cover the chemistry of chromium and its compounds. The book starts with a brief account of the history of chromium and continues, through the mineralogy and geology of chromium, to the analytic chemistry and the physical and chemical