they are very good indeed. In chapter 7 the authors discuss polycrystalline arrays, crystallite size and orientation, crystalline texture, precision measurement of lattice parameters, and internal stress determinations. In chapter 8 they treat the imperfect crystal, the small crystallite, and some of the methods and results of small angle x-ray scattering.

In general, the purposes of this volume, and of the series, have been well achieved. The reader will find a clear and always authoritative discussion of most of the areas in which x-rays are a useful tool for structural studies. Applications to physics and physical metallurgy have perhaps been emphasized a little compared to chemistry and biology. A minor annoyance is the too skimpy list of references. Frequently a new method or development is described, but without reference to the original, or even to a review article, where more complete details might be found.

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Inorganic Chemistry

Anorganische Chemie. vols. 2 and 3. István Náray-Szabó. Translated into German by András Beliczay. Akademiai Kiado, Budapest; Akademie Verlag, Berlin, 1963. vol. 2, 813 pp.; vol. 3, 669 pp. Illus.

In the second volume of this series [volume 1 was reviewed in *Science* **131**, 1214 (1960)] the author describes elements and compounds of the alkalies, alkaline earths, and aluminum and the transition metals of groups III through VII; actinides and lanthanides are also included.

The salts described include hydrides; halides; polyhalides; oxides, peroxides, and hydroxides; oxyhalides; sulfides and sulfur oxyacid salts; selenides and tellurides and the corresponding oxyacids; phosphides, arsenides, and their oxyacids; carbides, acetylides, carbonates, and combinations of carbon, nitrogen, and oxygen; compounds with silicon, germanium, lead, tin, and boron, with and without oxygen; and double and complex salts.

In the third volume information is given about copper, silver, gold, zinc, cadmium, mercury, gallium, indium, thallium, Group VIII, and the inert gases. The salts and compounds are treated in the same order as in the previous volumes. A review of the chemical properties of the elements and a short chapter on geochemistry and cosmochemistry conclude the volume.

Each group is introduced by a presentation of the electronic structure of the respective elements and their ionization and excitation potentials. This is followed by a concise discussion of valency, crystalline structure, melting points, ionic radii, the most characteristic chemical compounds, and the abundances of the elements.

In describing individual elements the author gives a short historical introduction followed by sections on the occurrence, nomenclature, and abundance of minerals, preparation of the element (on a laboratory and on a commercial scale), and their physical properties (with a tabulation of constants), chemical properties, and compounds. Application, world production, physiological activity, and analysis are also considered. This is followed by a description of chemical compounds for each group of elements, with a tabulation of physical constants.

The books represent a substantial amount of information presented in a manner that is clear, systematic, and uniform; thus they fulfill the purpose stated by the author. That the data are reasonably up to date is illustrated by the inclusion of information on krypton tetrafluoride, which was published in 1963.

Scientists and students who require a simple, concise reference source on inorganic substances should find these volumes particularly useful.

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Mathematical Physics

Mathematical Models in Physical Sciences. Proceedings of the conference held at Notre Dame, Indiana, April 1962. Stefan Drobot and Paul A. Viebrock, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1963. x + 193 pp. Illus. $5.

In contrast with the atmosphere encountered at an increasing number of conferences, the atmosphere that held sway at the conference which gave birth to this slender volume must have been almost Victorian in its leisureliness. A small but generally distinguished group of speakers addressed a somewhat larger but almost equally distinguished audience on a remarkably broad range of subjects in mathematical physics; the speakers emphasized problems in classical physics and the mathematics of the models rather than their physical utility. Thus, there were two talks on the problem of the liquid-gas phase transition (by G. E. Uhlenbeck and Mark Kac; unfortunately the two addresses are represented only by abstracts in the volume); a short account by Harold Grad of his work on the mathematical foundations of the description of transport phenomena; and a very informative presentation by Norman J. Zabusky of his work on a model for the oscillations of a nonlinear string. The latter article is one of the few in the volume which is relatively self-contained. Zabusky gives an account of the previous (numerical) study of the model and of his own effort to understand analytically the basic phenomena yielded by the machine calculations.

Less readily placed in a category are papers by Martin D. Kruskal, Stan M. Ulam, and Jerzy Neyman. In a unique paper entitled "Asymptotology," Kruskal tries to summarize, in the form of principles, the techniques for obtaining the limiting behavior of systems of equations as some parameters decrease. Ulam summarizes all too briefly some computing machine investigations of nonlinear algebraic transformations and of nonlinear partial differential equations. Neyman recounts (in what is for this volume a relatively long article) his study, by means of the theory of probability, of the data produced by astronomers on the distribution of galaxies.

Of 11 technical presentations, only two were concerned with the quantum theory. F. J. Dyson summarized some of his own work and some of that carried out by others on a new version of statistical mechanics, which has important application to atomic and nuclear spectroscopy. My personal favorite is a beautiful article by Rudolf Haag on the mathematical foundations of the Barden-Cooper-Schrieffer model of superconductivity. The report concludes with an article on constraints in classical fields, written by the organizer of the conference, Stefan Drobot.

The volume contains a complete list of the conference participants, drawn from as wide a variety of fields as the speakers themselves. It is an amusing exercise for the reader to gauge the