

pressed require the exercise of good judgment for their proper use.

Plainly, the reviewer of a *Gmelin* volume devoted mainly to chemistry is in difficulty—almost everything he can say has been said before. The present case is different. Germanium happens to be the first of the two elements that are making history as semiconductors. The book under review deals principally (pp. 132-454) with solid-state physics. Does the *Gmelin-Institut für Anorganische Chemie und Grenzgebiete* consider solid-state physics a *Grenzgebiet*? In any case, two colleagues expert in this field share my high opinion of what the *Institut* has done therein. The arrangement of the table of contents, a little puzzling on first glance, was clearly adopted because the overriding importance of the electrical properties of germanium could not have been foreseen when the 62-page *Hauptband* (sic!) appeared in 1931.

Where is inorganic chemistry going? Will it become the handmaiden of solid-state physics and similar disciplines? Which is more important, materials or processes? These are not idle questions, though it is idle to attempt answering them now. They are related to the *Grenzgebiet* problem raised above. Let us consider: Very roughly, 62 pages of "chemistry" in 1931 have grown to 254 pages in 1958. There have been added 322 pages on electrical properties, which cover the literature only to the end of 1954 although isolated later references appear. Work on germanium as a semi-conductor is still extensive. Beyond germanium, there is silicon; beyond silicon, a great many semi-conducting compounds. Where will it end?

Let us hope our friends the physicists will put the present volume to good use. If they do this, and refrain from compiling the same information for themselves, perhaps physicists and inorganic chemists will become so well acquainted that the questions of the previous paragraph will answer themselves.

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Effect of Surface on the Behaviour of Metals. Lectures Delivered at the Institution of Metallurgists Refresher Course, 1957. The Institution of Metallurgists. Philosophical Library, Inc., 15 East 50 Street, New York 16, N. Y. 1958. vii + 100 pp. 14 × 22 cm. Price, \$10.00.

This small book comprises material originally presented in the form of lectures dealing with the effect of surface on the behavior of metals. These lectures were delivered for the Institution of Metallurgists at Llandudno during the annual refresher course in 1957. The first chapter by G. L. J. Bailey, entitled "Methods of Preparation and Examination of Surfaces," is concerned mainly with methods for studying the shape, composition and structure of surfaces both on a microscopic and atomic scale. Among other methods recent improvements in field-emission microscopes by Müller to yield resolutions of better than 3 Å. are cited, and also developments in the electron probe microanalyser. Beilby's flow theory of polish is considered to be considerably weakened by studies of Samuels on abrasion, polishing and etching which are discussed. The second chapter by T. P. Hoar, entitled the "Influence of Surface Treatments on the Chemical Behavior of Metals," stresses the importance of anodic processes occurring at the metal surface. The effects of mechanical work, and of electrochemical and chemical films of oxide, sulfide, and oxygen in passivation are considered. It is emphasized that pure surfaces are not obtained by electropolishing which can leave a protective film on the metal surface. The third chapter by F. T. Barwell entitled "Relationship between Surface Condition, Friction and Wear" deals with the nature of frictional contact and the effect on it of temperature, and gases such as oxygen, hydrogen sulfide, water vapor, etc. Fretting corrosion, pitting, scuffing and wear of cutting tools, plain bearings and engine cylinder bore corrosion are briefly considered. Effects of artificially produced surface films of oxide, sulfide and phosphate are also discussed. Recent research has involved studies of the Russell Effect, The Krauer Effect, and Rehinder Effect. The last chapter, by R. W. B. Stephens, entitled "Influence of Surface on the Physical

Properties of Metals" makes a more mathematical approach to the nature and concept of a surface and presents a brief account of the free electron theory of metals. The importance of optical methods in surface investigation is stressed including polarimetric methods, and studies of the anomalous skin effect. The use of moiré fringe patterns in electron micrographs for the observation of dislocations is illustrated. Other subjects which receive attention are: electrical resistance, thermal properties, thermal contact coefficient, thermal accommodation coefficient, magnetic properties, thermomagnetic properties, galvanometric effects, and diffusion.

Because of the wide range of topics covered the treatment although for the most part excellent is of necessity brief. However, a good bibliography is appended to each chapter indicating where more detailed treatment is to be found. As is natural much of the material presented is of British origin although early work by Langmuir, and more recent studies by Gomer are cited. However, the excellent work of Gwathmey and associates is not mentioned. A number of excellent plates enhance the value of this text. It is believed that the audience to which this small book is addressed, and also others interested in the nature and properties of metallic surfaces, will find it a stimulating account of progress and recent advances in its field.

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Fortschritte der Chemie Organischer Naturstoffe (Progress in the Chemistry of Organic Natural Products). Edited by L. ZECHMEISTER. Springer-Verlag, Mölkerbastei 5, Wien 1, Austria. 1958. vi + 244 pp. 16 × 23.5 cm. Price, \$9.75.

This volume of the *Fortschritte*, one of two appearing at the same time, contains four essays, several of which are devoted largely to the work of a single group. Schlubach has surveyed the painstaking work at the Hamburg Staatsinstitut on the isolation and analysis of the polyfructosans of grasses, and summarizes the significance of carbohydrate metabolism in the problem of food production. Zechmeister presents a collection of miscellaneous studies on the dehydrogenation and isomerization of carotenoids, much of the material being taken from recent work in his laboratories. A description of the X-ray structural analysis of B₁₂ by Dorothy Crowfoot Hodgkins gives an insight of this approach to complex structural problems, although the reader unfamiliar with the interpretation of electron density projections may have some difficulty in following the development of the structure. The very detailed and comprehensive account of the chemistry of podophyllum constituents by Hartwell and Schrecker is most representative of the definitive and critical reviews of a widely diverse literature for which this series is notable.

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Pregl-Roth Quantitative Organische Mikroanalyse. Sicbente, vollkommen neu bearbeitete und erweiterte Auflage. By DR. H. ROTH, Badische Anilin- und Soda-Fabrik AG, Ludwigshafen A. Rhein Landwirtschaftliche Versuchsstation Lünburgerhof/Pfalz. Springer-Verlag, Mölkerbastei 5, Wien 1, Austria. 1958. xiii + 361 pp. 15.5 × 23.5 cm. Price, \$11.85.

The seventh edition of the excellent book by Dr. Roth will make a valuable addition to libraries. It has been written in the same style as the previous editions. The book is divided into four sections.

The first section includes general information regarding microchemical balances, their use, and the auxiliary tools for handling and weighing samples and objects. Included here are also the preparation of standard solutions and the preparation of samples for analysis.

The second section of the book is devoted to the determination of the elements in the following order: carbon, hydrogen, oxygen, nitrogen, halogens, sulfur, selenium,