mation, the corrosion and electrochemistry (electrodeposition, galvanic cells) of each system is discussed. The last two authors also contributed a short paper on the standard free enthalpy of $SnH_4(g)$. A paper by Brown, plus the discussion which follows, gives a very full background on the chemistry of the I_2–H_2O system and should be most useful to anyone interested in iodine and its compounds in aqueous systems. The section is completed by a good paper by Maronny and Valensi on the calorimetric determination of various thermodynamic functions for the polysulfide ion $S^{2}{}_{5}{}^{-}$.

The reports of Study Groups one and two on corrosion and on batteries and accumulators, respectively, were brief and not particularly informative. Associated with each, however, was an original paper of some interest which should have appeared earlier than they did. Darsulin and Markovic studied the mechanism of corrosion of lead in water–dioxane systems containing air, and concluded that the water molecule is split giving an oxide and a hydrogen-sorbed lead surface. The rate of lead corrosion is said to be controlled then by competition between the formation of the adsorption "surface compound" and the rate of access of oxygen to the surface. Brenet, Grund and Jolas studied the effect of heating on MnO_2 structure and on the Mn–O ratio. The work is incomplete in that the changes found have not yet been related to the important electrochemical effects in the dry cell.

This volume covers such a wide range of topics that a critical review of each contribution was not feasible. However, the quality throughout is generally satisfactory or better. Thus for various reasons, various people should find this a useful book to have handy.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF TEXAS NORMAN HACKERMAN
AUSTIN, TEXAS

Synthesis of Heterocyclic Compounds. Issue I. A. L. MNDJOIAN, Editor. Publishing House of the Academy of Sciences of the Armenian SSR, Ulitsa Abovyana, No. 124, Erevan, Armenian SSR, USSR. 1956. 84 pp. 15 × 22.5 cm. Price, 5 rubles (with binding).

This little booklet is patterned after the well-known "Organic Syntheses" in style of writing and composition of the individual items.

As stated by the editor, until the publication of this book, which is stated to be the first of a series, there has been a lack of small and inexpensive books giving practical directions for the synthesis of heterocyclic compounds. Such preparations are scattered through the literature although some do appear in "Organic Syntheses." The original publications, however, are often not given in sufficient detail to be reliable or workable, and a series of small books describing practical syntheses of heterocyclics should be very useful.

This reviewer fully supports the author in this purpose. There are many compendia on heterocyclic compounds, but for the most part these are of a descriptive or theoretical nature rather than manuals of practical directions.

The present booklet covers a number of readily carried out syntheses of furan derivatives. They are to a large extent taken from Mndjoian's own publications in the Journals of the Armenian Academy in 1953. Many are simple adaptations of earlier descriptions in Western publications.

Mndjoian has been active in the general area of organic pharmaceuticals for a number of years, and has reported a large number of preparations of esters and amides useful in the general area of anesthetics and antihistaminics in the Armenian journals. The furan series is only one of the lines of work. The present booklet largely collects these data in one place. The original descriptions in the Armenian journals were mere lists of the compounds made with descriptions of physical constants but as a rule no details of the methods of synthesis were given owing to lack of space.

In the introduction the author states that the Institute of Fine Organic Chemistry of the Armenian SSR is undertaking a periodic publication of such volumes in heterocyclic syntheses. Along with material taken from the work of this Institute (in which Mndjoian is a leading chemist), he states that methods developed by others will also be published. The preparations are checked and verified in the "Organic Syntheses" tradition. Apparently several additional volumes will also be devoted to furan derivatives.

This reviewer's personal reaction to this little volume is good. It is well put together in a style familiar to all practicing chemists, references are well annotated and proper credit is given to previous work. A reading of the book did not disclose any apparently unworkable stages in the syntheses. Very sensibly the irritant properties of halomethylfurans are mentioned as warnings in the text. This is also common "Organic Syntheses" practice.

If the series is continued and is diversified to other heterocyclic systems, it will make a very useful and inexpensive addition to a chemist's personal library (provided he reads Russian). Current books in this country on heterocyclics are becoming too expensive for most bench chemists.

ROSS CHEMICAL LABORATORY
ALABAMA POLYTECHNIC INSTITUTE
AUBURN, ALABAMA GENNADY M. KOSOLAPOFF

Chemisorption. Proceedings of a Symposium held at the University College of North Staffordshire, Keele, Staffordshire, by The Chemical Society, 16–19 July, 1956. Edited by Professor W. E. GARNER, C.B.E., D.Sc., F.R.S. Academic Press Inc., Publishers, 111 Fifth Avenue, New York 3, N. Y. 1957. xii + 277 pp. 14.5 × 22 cm. Price, $9.00.

The subject of chemisorption, particularly in relation to the chemistry of the solid state and the kinetics of surface reactions, is undergoing extremely rapid development. Over the past few years our knowledge of the nature of chemisorption has advanced from a vague notion of the saturation of residual valence bonds at surfaces to much more precise ideas in which Brillouin zones, Fermi levels, conduction bands, impurity levels and d electrons play a prominent and well-defined role. There is still much room for advancement, however, since a number of important points remain unsettled and a few contradictions still exist. For this reason the publication of the proceedings of a symposium in which the participants are all distinguished workers in the field is particularly timely, and those interested and fairly familiar with the subject will find much of value in the present volume.

Space does not permit even a reference to each individual paper, and the reviewer will content himself with commenting on a few of the contributions that seemed to him to be of special interest. The group of papers dealing with chemisorption on metals is a particularly strong one; most of the important phases of the subject are covered. Conductivity changes on adsorption on metal films are described by Suhrmann, while Mignolet extends his previous work on charge transfer during chemisorption. Bond and Addy deal with chemisorption and catalysis on metals of group VIII, while Eley and Rossington, and Gundry and Tompkins, deal more particularly with kinetic aspects of chemisorption. A very interesting paper by Leck describes experiments on chemisorption resulting from the bombardment of metal surfaces by positive ions with energies up to 5000 e.v.

The group of papers on semiconductors also contains several significant contributions. The introductory paper by Stone is a particularly lucid and useful one. Winter reviews his results on the exchange of ^{18}O between O_2 gas and oxide surfaces, while papers by Rudham and Stone, McConnell and Roberts, and R. J. Davis, deal with processes at the surfaces of various other oxides. A group of papers dealing with adsorption on insulators includes interesting contributions by Kipling and Peakall and by Gregg on the adsorption of water and other vapors on oxides, and by Kloosterziel on hydrogen-containing aluminum oxides.

A somewhat disappointing group of papers comprises those dealing with the theory of chemisorption; one could, indeed, glean more of the theory by reading the other papers than the four in this group. Dowden's introductory paper is written in such a condensed manner as to be largely unintelligible to anyone not already entirely familiar with the field. Grimley gives an interesting formal treatment of the quantum mechanics of the chemisorption of hydrogen on a metal surface, and in this section one might have hoped for parallel treatments of other kinds of systems. A paper by de Boer gives an authoritative discussion of the possible factors leading to a decrease of the heat of chemisorption with coverage. A paper by Schuit, de Boer and co-workers,