The book is essentially a concise and critical survey with an excellent bibliography for each element. It is a compact source of well chosen information on each of the radioelements, with emphasis on techniques of separation and tracer chemistry. The general reader cannot but be impressed with the practical importance of the Periodic Table in the development of separation and purification techniques and its aid in understanding the chemical behavior of each radioelement. Dr. Bagnall constantly stresses the importance of the similarities and differences which exist between each radioelement and its homologs: Po and Te; At and I; Fr and Cs; Rn and the inert gases; Ra and Ba; Ac and the rare earths, especially La.

A strong point of the book is the considerable emphasis on the techniques of handling curie-level activities of radioelements. His discussion of health hazards, glove-box techniques, and methods for contamination control is not included as an afterthought, but is the subject of two chapters and is also woven into the text. The reader, therefore, is kept aware of the prime importance of good hot-laboratory techniques. This is no business for careless amateurs, especially when dealing with milligram amounts of elements such as Po^{210} and Ac^{227}!

ARGONNE NATIONAL LABORATORY
LEMONT, ILLINOIS JACK SCHUBERT

Gmelins Handbuch der Anorganischen Chemie. Achte Völlig Neu Bearbeitete Auflage. Calcium. Teil B—Lieferung 2. Verbindungen Bis Dithionit. System-Nummer 28. E. H. ERICH PIETSCH, Editor. Verlag Chemie, G.m.b.H., (17a) Weinheim/Bergstr., Germany. 1957. xvi + 392 pp. 17.5 × 25.5 cm. Price, DM 219. ($52.56).

Gmelins Handbuch der Anorganischen Chemie. Achte Völlig Neu Bearbeitete Auflage. Kupfer. Teil B—Lieferung 1. Verbindungen Bis Kupfertellurate. System-Nummer 60. E. H. ERICH PIETSCH, Editor. Verlag Chemie, G.m.b.H., (17a) Weinheim/Bergstr., Germany. 1958. xxvii + 624 pp. 17.5 × 25.5 cm. Price, DM 349.—($83.76).

Gmelins Handbuch der Anorganischen Chemie. 8th Edition. **Systematik der Sachverhalte.** E. H. ERICH PIETSCH, Editor. Verlag Chemie, G.m.b.H., (17a) Weinheim/Bergstr., Germany. 1957. xiv + 116 pp. 17.5 × 25.5 cm. Price, DM 72.—($17.28).

The calcium volume numbered B-2 is actually the first section on the physical and chemical properties of the compounds of calcium, the "B-1" part having covered the technology of both the element and its compounds, material usually given in the "A" volumes of the Gmelin series. The new volume covers the compounds of calcium with the first eight (helium–iodine) of the elements according to the Gmelin system numbers, and some of its compounds with sulfur, no. 9. The volume on copper (B-1) corresponds to "B-2" for calcium, taking up not the technology but the usual physical properties and chemical relations of the compounds; it covers the copper compound with the elements through tellurium (system number 11).

The presentation is all that we have come to expect in these magnificent digests, distinguished by regularity of order, clarity of headings, completeness of information with numerous diagrams and numerical tables, critical evaluation and comments, and full and valuable documentation.

The extreme condensation of the presentation necessitates so many word abbreviations that some of the sentences appear cryptic. At the same time the Handbuch continues to present literature references in its familiar clear and convenient fashion, repeating them fully in every new paragraph or section when necessary. Although some space might be saved by the invention of still another "number system" for this purpose, the clarity and the immediate availability of the references justify the space used.

Both volumes presumably cover the literature through 1949 completely, and the copper volume, it is stated, also includes the literature through 1954 "in special cases." Actually, a considerable number of references through 1953 also appear in the calcium volume. In neither case, however, would the reader be safe in assuming a coverage later than 1949 for any particular item.

The high price for the regular volumes of this series is evidently a necessity, in view of the amount of work obviously going into them. On the other hand the price of the "Systematik," a special volume outside the regular series, is puzzling. Hardly more than a pamphlet, this is a detailed outline covering the headings systematically used in the Handbuch, and it is presented in both English and German, side by side on every page. It offers a numerical cataloguing scheme, with about 2000 headings, of particular value in card-filing and in cross-referencing, for the indexing and filing of the information available in the Handbuch. Although simply an outline of headings, the price is the same as that of the regular Gmelin volumes themselves, namely, about 13 cents per page, with many of the pages, moreover, practically blank.

The price of these books has long ago left the individual behind as a purchaser, but one begins to wonder even how many modestly endowed libraries can afford them. Because of their great value, however, one hopes that every research library can have them available.

DEPARTMENT OF CHEMISTRY
NEW YORK UNIVERSITY JOHN E. RICCI
NEW YORK, N. Y.

Organic Syntheses. Volume 37. JAMES CASON, Editor-in-Chief. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, 16, N. Y. 1957. vii + 109 pp. 15 × 23.5 cm. Price, $4.00.

The importance of "Organic Syntheses" preparations to organic chemists all over the world, whether inexperienced or experienced, students or masters of the art, has been so well-recognized that this new volume needs no more introduction than the announcement of its publication and a listing of the preparations included. The fact that the editor of the current volume is Cason guarantees that its users will find the high level of reliability of procedures and degree of usefulness expected on the basis of the preceding volumes.

Not so well-recognized, particularly among younger chemists, is the tremendous amount of time and effort on the part of the volume editor, the other members of the editorial board and collaborators in their laboratories, as well as by the submitters, which is necessary to ensure this degree of excellence and reproducibility of the preparations included. The careful preliminary screening of every preparation submitted, and the repeated checking in the laboratory of one of the associate editors of each considered potentially suitable—an experimental process that takes more than a week in the best cases and has extended over several years in more than a few—has been the key factor which has ensured the high quality and reproducibility, in the opinion of the reviewer.

In the present volume each preparation was chosen for some useful reason. In some cases this is because the product is of more than limited use or the procedure represents a good example of a generally useful reaction; included are: 2-chloro-2-methylcyclohexanone and 2-methyl-2-cyclohexenone, 2-chloronicotinonitrile, diaminouracil hydrochloride, 1-diethylamino-3-butanone, diethyl benzoylmalonate (use of mixed benzoic-carbonic anhydride), *trans*-2-dodecenoic acid, ethyl *t*-butyl malonate, 4-ethyl-2-methyl-2-octenoic acid, ethyl α-nitrobutyrate, glutaric acid and glutarimide, *n*-heptamide, 3-*n*-heptyl-5-cyanocytosine, 4-hydroxy-1-butanesulfonic acid sultone, isophorone oxide, 3-methyloxindole, nicotinamide-1-oxide, norbornylene, pseudopelletierine, stearolic acid and *ar*-tetrahydro-α-naphthol (lithium–ammonia reduction). Two preparations, benzoylacetanilide and oleoyl chloride, illustrate the utility of a convenient laboratory-size continuous reactor. The remaining procedures, which might well be included in the first category by another reviewer, and apparently were chosen for miscellaneous reasons, including novelty, comprise the following: benzofurazan oxide, 3-benzoylpyridine, 3,4-dinitro-3-hexene, 1,4-diphenyl-5-amino-1,2,3-triazole and its rearrangement to 4-phenyl-5-anilino-1,2,3-triazole, ethyl benzoylacetate (use of aqueous sodium hydroxide for the acylation), parabanic acid and trichloromethylphosphonyl dichloride.

Now that "Organic Syntheses" is nearing the end of its fourth decade, and in light of the advances of modern organic chemistry, the questions are heard: Is the present character of "Organic Syntheses" the best for the future?

Will continuation of the present plan for the series result in as important an influence for improving organic chemistry in the future as it has in the past? The answer to the second question must be no, even by the most sympathetic chemist, and to no small degree *because* the series has been so influential in the past, particularly during the period before 1940. On the other hand, the need for tested, reliable experiments and procedures is no less today, and in certain areas may be greater than in the past, as a result of the understandable, but unfortunate, tendency to reduce experimental sections of publications still further, in response to various pressures, including the financial facts of publication today. While in only a few chemistry journals has this trend yet reached the stage as to make the experiments difficult or impossible to reproduce, the other aspect of the problem compounds the difficulty even in the best financed of journals. Because of preoccupation in other phases of the research problem, both experimental and theoretical, and doubtless for good reasons, a smaller proportion of the published experiments today, as compared to certain earlier periods, represent well-worked out procedures described with sufficient skill and clarity as to be reproducible in the hands of an *experienced* organic chemist *without* any major difficulty.

This in the reviewer's opinion, then, underlines the continuing need for "Organic Syntheses." But is it not possible that the time and efforts of the editorial board and their collaborators might be utilized still more fruitfully if the present policy were modified? Perhaps a reduction in the frequency of volumes from annual to biannual would allow the time saved to be spent on soliciting and perfecting more examples of the most immediate and permanent value: those which exemplify the use of new and widely applicable, or cleanly selective, reactions, apparatus and techniques. Perhaps this is an appropriate time for those users of "Organic Syntheses" with constructive criticisms to write them to the editorial board.

Regardless of any minor or major disagreement in these matters, all who carry out organic chemical reactions in the laboratory, or who use the compounds described, will continue to be grateful to the editors of "Organic Syntheses" and to the submitters of good procedures for their generosity with their time and talents for the general good of chemistry.

DEPARTMENT OF CHEMISTRY
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Chemistry of Natural and Synthetic Rubbers. By HARRY L. FISHER, Professor of Chemical Engineering, Director of TLARGI Rubber Technology Foundation, University of Southern California, Los Angeles, California. Reinhold Publishing Corporation 430 Park Avenue, New York 22, N. Y. 1957. vii + 208 pp. 16 × 23.5 cm. Price, $6.50.

The author of this small volume has been active in rubber chemistry for over 40 years. His great interest and enthusiasm for his subject is reflected in his writing.

The scope of his book is broad. He had divided it into 13 chapters which cover almost all of the major topics of rubber chemistry. The only important topic that the reviewer has noted to be missing is filler reinforcement. The author has not missed many others; for instance, in his 69-page chapter on synthetic rubber he discusses 19 different polymers ranging from plasticized PVC to "synthetic natural" rubber.

Dr. Fisher has participated in many of the important developments in rubber technology, and he is able to recall personal experiences associated with these developments in a very interesting manner. His procedure is to give a short historical treatment to each subject before giving a chemical exposition of it. His point of view is that of the synthetic organic chemist. When he attempts to discuss the physicochemical aspects of rubber chemistry, his treatment is frequently weak as for instance in his discussion of intrinsic viscosity on page 77. Because he has attempted to cover so many subjects, his comments on each are necessarily brief.

The book is easy to read and can certainly be completed in one evening by a chemist experienced in the field. The style is generally that of a popular essayist rather than that of a scientific investigator writing for a journal. The author is quite inconsistent in his preparation of bibliographies. After a 12-page discussion of general purpose synthetic rubber, no bibliography is given, but after an 18-page discussion of chemical derivatives of rubber, a rather complete bibliography listing 5 general references and 47 specific references is attached.

The book offers an interesting review of rubber technology to one active in the field and a broad but necessarily shallow introduction of the subject to a scientist new to the field.

UNITED STATES RUBBER COMPANY
RESEARCH CENTER M. C. BROOKS
WAYNE, NEW JERSEY

Einführüng in Die Ultrarotspektroskopie. 2. Neubearbeitete Auflage. By DR. WERNER BRÜGEL, Physiker in der Badischen Anilin- and Soda-Fabrik AG., Ludwigshafen a. Rh. Verlag Dr. Dietrich Steinkopff, Holzhofallee 35, Darmstadt, Germany. 1957. xii + 404 pp. 15 × 21 cm. Price, brosch. DM 49, —; geb. DM 52, —.

This is a useful book and the infrared spectroscopist should have one in his personal library. It is written in four parts. The first part gives a introduction to the necessary theoretical background for a reasonable understanding of observations in experimental infrared spectroscopy. It contains the usual quantum mechanical introduction with discussions of symmetry properties, selection rules, rotational spectra, vibrational spectra, vibrational–rotational spectra and intensities. One chapter is devoted to theory concerning the infrared spectra of liquids and solids. The second part gives a discussion of the equipment and preparation techniques used in infrared spectroscopy. It contains discussions of radiation sources, monochromators, detectors, etc. There is a chapter which describes all of the commercial instruments as well as chapters on accessories and sample handling techniques. The third part is concerned with methods of practicing infrared spectroscopy. After introducing the concept of group frequency, considerable space is devoted to the correlation of group frequencies with molecular and bond structure. This is followed by a discussion of qualitative analysis and quantitative analysis by infrared means. There is a chapter which presents methods of obtaining reflection and polarization spectra and the application of microspectroscopic equipment. The fourth part presents a number of results and applications. It contains a chapter on important group substances including a discussion of paraffins, cycloparaffins, olefins, carbonyl compounds, other oxygen-containing compounds, nitrogen-containing substances, etc. Other chapters contain material on polymers, inorganic substances and special effects such as hydrogen bonding, rotational isomers and the spectra of adsorbed substances.

The author has done a good job of bringing together in one volume a treatment of theory, instrumentation, sample handling, group frequency methods and a wide range of results and applications.

DEPARTMENT OF CHEMISTRY
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Infrared Absorption Spectra of Steroids. An Atlas. Volume II. By GLYN ROBERTS, BEATRICE S. GALLAGHER and R. NORMAN JONES, The Sloan–Kettering Institute for Cancer Research and the National Research Council of Canada. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1958. viii + 478 pp. 16 × 23.5 cm. Price, $20.00.

This volume greatly increases the value of infrared absorption spectra as a means of characterizing steroids. It is also of general value as a model in the systematic use of infrared data as an aid in the identification of organic compounds.

The format is the same one employed for Volume I. The spectra are represented on a linear wave number scale, and are true absorption curves with the ordinate values showing percentage absorption. A blank page opposite each spectrum provides the user with convenient space for noting assignments and comments. The charts in this volume are numbered from 309 to 760 in continuation from Volume I. Charts 309-668 give spectra for 360 steroids. About 50