interval chosen for collection. A device to facilitate collection under these circumstances was therefore developed.

It consists of 5 main components (Fig. 1): (1) a wooden base through which protrudes the open end of a brass tube connected on the outside to an evacuation pump; (2) plastic spools to carry 21 tubes for collecting blood; (3) a ratchet system for moving the spool; (4) a modified antenna relay and solenoid to provide thrust and retraction to an actuating arm operating the ratchet; and (5) a glass battery jar fitted tightly to the wooden base and provided with a 10-mm opening, placed directly over the circumference described by the collecting tubes, and fitted with a rubber stopper.

The modified antenna relay Type 314 has a quick thrust and no appreciable lag when operated at a voltage slightly in excess of its normal rating. A solenoid was found to be more satisfactory than a spring for providing reverse movement to the relay arm since the spring tension contributed materially to the lag. The system may be manually operated by a pushbutton switch or by an electronically controlled timing device. The timing device can be regulated to give various intervals between thrusts.

Blood is collected by inserting the arterial catheter through a rubber diaphragm that covers the hub of a needle of suitable size that in turn is introduced through the rubber stopper in the battery jar. Arterial flow is in the form of a series of regular drops; and, under the conditions described, about 0.2–0.3 ml of blood can be collected every 2 sec. As little as 0.1 cc of blood is adequate for dye determinations if whole blood, instead of serum, is employed (*1*). The negative pressure inside the battery jar is equal to approximately 4.5 cm of mercury, and is constant.

The device can be used, with or without the vacuum, for the collection of other biological specimens at various time intervals. For collection of samples at intervals of less than 2 sec, however, a spool constructed according to the design of Asmussen and Nielson (*2*) is preferable to the one shown.

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Book Reviews

Structure Reports for 1949, Vol. 11. A. J. C. Wilson, Gen. Ed.; C. S. Barrett (Metals), J. M. Bijvoet (Inorganic Compounds), and J. Monteath Robertson (Organic Compounds), Section Eds. Utrecht: Oosthoek, 1952. (For the International Union of Crystallography.) 477 pp. Illus.

In 1931 P. P. Ewald and C. Hermann published the first *Strukturbericht.* This was followed by six more volumes up to 1939. These were issued as special supplements to the *Z. Kristallographie,* containing a thorough critical review of structure work. The war interrupted this work and at the Cambridge, Massachusetts meeting in 1948, the Crystallographic Union decided that one of its goals would be to continue the critical review of structures. Thus we have now this first postwar volume of structure reports, issued with the financial help of UNESCO, British and American research organizations, and industrial firms.

The present volume, a discussion of recent work, is supposed to be followed by a complete digest of the work between 1939 and 1947 to fill Volumes 1 to 10 to make the structure reports complete.

One should not miss this occasion to express the gratitude of all scientists, not only to the present group, but particularly to P. P. Ewald, who first realized the great importance of a critical review of crystal structure analysis in the *Strukturbericht.* The words of thanks with which he sent this new volume into the world, "One should not forget what the world owes to the patient, meticulous, and expert editors, who often set aside their own interests in order to build up this work for the common good of all their fellow workers," should go also to Ewald himself and his original group of collaborators.

The present volume is divided into three sections: "The Structure of Metals," edited by C. S. Barrett (184 pp.), "The Structure of Inorganic Compounds," edited by J. M. Bijvoet (340 pp.), and the final section on organic compounds (226 pp.), edited by J. Monteath Robertson. The editors had the help of some 30 abstractors.

Structure reports do not contain abstracts in the usual sense, but a careful analysis is made of all the information regarding structure, so that it is not necessary to look up the original papers. If the new group of editors is going to follow the procedure of Ewald and his collaborators, then one may frequently find in their analysis information the author himself may have overlooked.

The arrangement of metals is strictly alphabetical: they are not included in the subject and formula indexes. In some cases there is a cross reference when similar structures are listed together (e.g., Al_3U,

Sn_3U); in others this cross reference is missing (e.g., $CeCo_2$, $CeNi_2$, $LaNi_2$). Si is discussed under both "metals" (p. 6) and "inorganic compounds" (p. 218, p. 516).

The first 25 pages on inorganic compounds, starting with diamond, graphite, and carbon, are an example of the thoroughness of the reviewers. They present an amount of information that is rarely found anywhere in such completeness. The number of papers represented and the description of the properties are such that the reader can orient himself about the structure information available at the present time and its relation to physical properties. It is particularly important that the structures analyzed and reported include some published in journals, such as the Russian, that are not readily available in university or industrial libraries.

This volume is an imposing contribution if one considers that most of these investigations cover the years 1947 and 1948 only, and it shows that a large amount of work is still to be done in this field. The preparation of the volume, the printing, and figures are excellent, and it will be of great value for research in physics, chemistry, and mineralogy.

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Astrophysics: The Atmosphere of the Sun and Stars. Lawrence H. Aller. New York: Ronald Press, 1953. 412 pp. Illus. $12.00.

In this and a proposed companion volume discussing stellar interiors, variable stars, and the interstellar medium, Dr. Aller wishes to give an account of modern developments in astrophysics, as well as discussing the fundamental ideas used by research workers in astrophysics. The present volume deals, as indicated in its title, with the atmospheres of stars and of the sun. The author has succeeded in giving a comprehensive and authoritative account of atmospheric problems and of the latest developments in this field.

One gets the impression that this book should first of all be intended for research workers. The author takes great care to show how the methods he describes are used to solve specific problems and discusses in detail such complicated procedures, for instance, as Chandrasekhar's method for dealing with radioactive transfer in an atmosphere. On the other hand, in the earlier chapters, problems are included, giving the impression that this book is intended to be a textbook for graduate students. This impression is further strengthened by the general style that reminds one strongly of the lecture theater.

As a textbook this volume is well planned but unfortunately not quite so well executed. The style is often too easy and vague. As instances I may give the footnote on page 7 where it is stated that the zero point of the magnitude scale is set by general agreement without, however, explaining how this zero point is set. Similarly, a statement on page 189 suggests that the binding energy of the negative hydrogen ion can be calculated exactly.

As a handbook for the research worker in the field, however, *Astrophysics* can be very highly recommended. After five introductory chapters discussing in some detail the physical theory used in the last part of the book, the final four chapters discuss in great detail the radiation of the stars, the continuous spectra of sun and stars, the Fraunhofer spectrum, and solar phenomena. The book is well produced and there is an extensive index.

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Synthetic Organic Chemistry. Romeo B. Wagner and Harry D. Zook. New York: Wiley; London: Chapman & Hall, 1953. 887 pp. $11.50.

This reference volume summarizes the important synthetic methods for the preparation of organic compounds containing one and two functional groups. The authors consulted journals and books from 1919 through 1950 and have organized an enormous mass of material into 39 chapters, each chapter dealing with a class of compounds and its simple substitution products and describing useful methods which are numbered. Description is very brief with the general method but not the experimental procedures given. At the end of each chapter one finds one or more tables in which the compounds are arranged according to the number of carbon atoms with a citation to the method number, percentage yields, chapter references, common physical constants, and derivatives.

Common names are used as in the original literature, but the compounds are readily located in the tables. The main index does not repeat the compounds in the tables but gives the page reference to the chapter where the synthesis of that particular class of compounds is described.

Some idea of the scope of the volume is indicated by the fact that there are 576 methods given, together with 118 tables including over 6000 compounds. The literature citations total more than 7000 and constitute a valuable timesaving service to chemists.

The compilation and systematic organization of all this information into one volume represent an enormous amount of work and the authors have rendered a real service to chemists in preparing this book. It will prove a useful reference volume.

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