

table. The numbers indicate counts per 10 mg. of substance per minute, after subtraction of the back-ground rate of 10 counts. The error was less than 1 count per minute.

	R-Azo- ovalbumin	Pneumococcus I	Serum proteins
First bleeding (day 5)	11	12	59
Second bleeding (day 9)	18	8	53
Third bleeding (day 16)	26	no antibody isolated (amount too small)	39

As a control on the purity of the precipitates, two experiments were carried out in which a small amount of pneumococcus I antiserum was added to radioactive serum containing no pneumococcus antibodies. After thorough mixing and standing for one hour in the refrigerator, the corresponding polysaccharide was added to precipitate the anti-

bodies. The precipitate was worked up in the same way as the others but contained no C^{14} (less than 0.1 count per minute per mg.).

The order of magnitude of the radioactivity found in the passive antiserum was essentially the same as that found by Heidelberger and Schoenheimer, *viz.*, about one-fifth to one-sixth of the serum proteins. Our results are in line with theirs, though we think it very probable that an exchange takes place with the injected or passive transfer antibody.

A detailed paper on this subject will be published later.

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NEW BOOKS

Elsevier's Encyclopaedia of Organic Chemistry. Volume 13, **Tricyclic Compounds.** Series III, **Carboisocyclic Condensed Compounds.** E. JOSEPHY AND F. RADT, EDITORS. Elsevier Publishing Company, Inc., 215 4th Avenue, New York 3, N. Y., 1946. xx + 1265 pages; 17.5 × 26 cm. Subscription Price, \$78.00; Serial Price, \$91.00; Single Volume Price, \$104. Volume 14, **Tetracyclic and Higher-Cyclic Compounds.** Series III, **Carboisocyclic Condensed Compounds.** New York, 1946. xx + 711 pages; 17.5 × 26 cm. Subscription Price, \$45.00; Serial Price, \$52.50; Single Volume Price \$60.00.

Elsevier is a monumental new encyclopedia of organic compounds comparable to Beilstein but written in English. The work was undertaken in Amsterdam in 1937 under the editorship of Drs. Edith Josephy and F. Radt, both formerly of the Beilstein staff. Volume 14, Tetracyclic and Higher-Cyclic Compounds, which includes sterols, sex hormones, triterpenes, and carcinogenic hydrocarbons, was selected as the first volume to be published because of the current interest in these fields. This volume was completed in 1940 but could not be published until 1946 because of the war. Volume 13, which includes anthracene, phenanthrene, the resin acids, dicyclopentadiene, trycylene, also bears the publication date 1946 and has just become available. Further volumes are scheduled for publication at intervals of about six months. The whole range of organic compounds is to be covered in a total of twenty volumes in thirty-eight parts. The production plan provides for completion of the work by 1963.

Elsevier is no English-language version of Beilstein; it is a thoroughly excellent competitive compendium with a character all its own. The most substantial difference in the scope of the two works is that Beilstein covers the patent literature whereas Elsevier does not; the absence of references to patents in the new work is a shortcoming in some fields but of little consequence in others. Elsevier shares with Beilstein a high quality of accuracy, reliability and thoroughness. It contains more and better formulas and numerous summarizing reaction charts; it is printed on good paper in easily readable type; and the whole scheme of publication of the new compendium represents a certain advance over the classical German documenta-

tion of organic chemistry. It is my opinion, however, that the one work supplements, rather than supplants, the other. What the user of either work most urgently requires is data and references of the most recent possible date. Immeasurable research time can be saved by any combination of reference works that will expedite literature searches. Since Beilstein and Elsevier operate on different publication schedules such that new volumes of each will cover recent literature in alternate fields, the combination of the two is bound to afford a better general coverage than either alone. For this reason alone, if for no other, Elsevier can be recommended as a worthwhile investment for the library of any active center of research already equipped with Beilstein.

The avowed ultimate goal of the Elsevier publication is to include complete references to the literature until four years prior to publication. The recently published Volume 13 bears evidence that this high standard of attainment may eventually be realized. This volume, published as of 1946 under the difficult circumstances of the post-war period, covers the whole literature through 1936 and includes most or all key references concerning the structure of compounds through 1941 or 1942. This high speed of documentation is achieved in part by use of an ingenious scheme for the citation of references; each item of information in the text is followed by a parenthetical citation of the year of publication and the name of the first author. The full references are then listed by years at the end of short sections. One advantage of the scheme is that additional references of any date can be entered at the last minute without disturbance of any sequence of reference numbers. Another is the avoidance of the frequent repetition of reference citations (*cf.* Beilstein). Another is that the reader can see from a glance at the list of references for a given section the date to which the literature survey has been carried.

The data cited in Elsevier were almost all taken directly from the original papers. A total of 229 journals were consulted in the composition of Volume 14. In the case of a few papers from obscure journals both the *Chemisches Zentralblatt* and *Chemical Abstracts* were consulted.

The system of arrangement employed in Elsevier is a simple and rational one based upon structure; closely re-

lated compounds are placed together, and derivatives are described along with the parent compounds. The reader is further assisted in rapidly finding specific compounds by excellent subject and formula indexes in each volume. The subject indexes have the valuable feature of including a number of summarizing entries that list groups of compounds of similar structural and functional types: "Carcinogenic compounds," "Vitamins and provitamins," "Azido compounds." The editors showed wisdom in deliberately refraining from introducing new systems of nomenclature; the names recorded are those chosen by the investigators who built the science. Elsevier is thus a chemist's book, and it will be used and liked by those who build the science of the future. In my opinion, the contrasting disregard of chemists' preferences as expressed in established usage detracts enormously from the usefulness and lasting influence of *Chemical Abstracts*.

My wife and I have made considerable use of the section on sterols in Volume 14 and have found it excellent. The highly confused early literature has been untangled with care and skill. Good judgment has been exercised in the discussions of structures that are still controversial and in the selection of best values of physical constants. The data cited include physiological actions, specific rotations for different wave lengths and in different solvents, absorption maxima (unfortunately without specification of the solvent), axis ratios of crystals, magnetic susceptibilities. Although the sterol section is very complete, we noticed the omission of Δ^2 -cholestene ("neocholestene"), discovered by Mauthner in 1909. We are sorry that Elsevier accepted Rosenheim and King's proposed names coprostene, coprostenone, and coprostenol for compounds obtained from cholesterol and more appropriately called Δ^4 -cholestene, cholestenone, and Δ^4 -cholestenol-3. We regret that the editors did not venture to cross the border of rigid classification and include D vitamins and the tachysterols along with ergosterol and 7-dehydrocholesterol and all the many other products of irradiation and isomerization. These are very minor points; we heartily endorse this splendid new Encyclopedia.

LOUIS F. FIESER

A Survey of Anti-Malarial Drugs 1941-1945. Edited by FREDERICK Y. WISELOGLE. Subsidized by the Office of Scientific Research and Development on Recommendation by the Committee on Medical Research. J. W. Edwards, Ann Arbor, Mich. 1946. Two volumes (the second in two parts). 1921 + xi pages. 22 × 28 cm. Price, \$30.00 the set.

In the Survey is presented an historical summary of the evolution of the organization developed under National Research Council auspices with funds from the Office of Scientific Research and Development for the all-out attack on the problem of the prevention and cure of malaria through chemotherapeutic means. Detailed data on the antimalarial activity of close to 15,000 substances which were examined for their response to experimental avian malarial are given. Further, pharmacological data are given on what appeared to be the more promising substances and extensive clinical data are recorded on those drugs which warranted clinical trial in man. The work is divided nominally into two volumes, the second volume appearing in two parts, making a total of three actual volumes.

In the first volume are recorded an outline of the organizational scheme whereby the whole vast undertaking was coordinated—a structure which by its flexibility and adaptability to changing emphasis may well serve as a model for future organizations; a critical and detailed discussion of the methods used in the pharmacological aspects of the problem, some of which represent for the first time a logical and rational approach to this and similar problems; and an equally detailed and rational discussion of the methods used in the clinical evaluation of the drugs which furnishes, at least as far as this reviewer is aware, one of the finest examples so far produced of the

development of methods for comparison of drugs under carefully controlled and standardized conditions. Incorporated into the two latter sections are critical discussions of hypotheses of the mode of action of certain chemical classes of drugs and of the biology of the various malaria infections. For the reader interested in securing an over-all picture of the relationship between chemical structure and antimalarial action, the summarizing tables dealing with chemical series of potential interest, which are incorporated in the discussion of the pharmacological aspects of the work, will be very useful.

The second volume (two parts) is devoted in its entirety to a tabulation of the results of the tests on all the compounds examined. The chemical classification used is novel, but after a moderate amount of study, presents no insurmountable difficulties in application. Presentation of the structural formula for every compound to which a definite structure can be assigned leaves no room for confusion regarding identity of the substances listed. One could wish that the mass of compounds listed in Volume II could have been arranged more in accordance with detailed structural variations. However, this is partially compensated for by the summarizing tables of Volume I. Of particular value is the discarding of the previously used and meaningless method of reporting antimalarial activity and toxicity as a therapeutic index and substitution thereof of absolute values in terms of selected standard substances such as quinine, sulfadiazine, etc. Also to be commended is the convention of reporting such data in exact mathematical equivalents referred to the standards rather than the use of such symbols as +, +++ or =. Of great value are the fine indices of which there are three: subject, molecular formula and Survey Number.

No details of the synthetic chemistry involved in the preparation of the drugs are given. Inclusion of this information would result in a work of inordinate size. By an arrangement whereby the authors of papers dealing with the large bulk of the synthetic chemistry list the drugs by Survey Number in their communications, sufficient cross referencing should be available to enable this gap to be conveniently filled from the chemists' point of view.

The work is clearly reproduced by the photo offset process and remarkably free from errors. It will prove of great value not only for one interested in the narrow field of the chemotherapy of malaria, but, by virtue of the mass of pure toxicity data alone as well as of the analytical methods described, to all who are interested in chemotherapy in general.

ROBERT C. ELDERFIELD

Advances in Enzymology. Vol. V. 1945. Edited by F. F. NORD, Fordham University, New York, N. Y., and C. H. WERKMAN, Iowa State College, Ames, Iowa. vii + 268 pp. Illustrated. 15.5 × 23.5 cm. Price \$5.50. Vol. VI. 1946. Edited by F. F. NORD. x + 563 pp. Illustrated. 15.5 × 23.5 cm. Price \$6.50. Vol. VII. 1947. Edited by F. F. NORD. xi + 665 pp. Illustrated. 16 × 23.5 cm. Price \$8.75. Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y.

The three most recent annual volumes of this valuable series continue the high standards set in the earlier volumes. When it is realized that these reviews were prepared while the writers were still under the stress of war conditions or were exposed to the almost equally disturbing events of the period immediately after the cessation of hostilities, the thoroughness and scientific detachment with which the topics have been discussed is the more surprising.

No adequate account of the contents of these volumes is possible in the space available. The reviewer must therefore content himself with reference to those chapters which were found to be most stimulating and informing. In Volume V, N. W. Pirie's thoroughly critical account of certain plant viruses is especially useful for its point of view. H. Blaschko's review of the amino acid decar-

boxylases of mammalian tissue together with that of E. F. Gale on the amino acid decarboxylases of bacteria in Volume VI summarize present day knowledge of this group of enzymes effectively. Gale's chapter is unusual inasmuch as so large a part of the material discussed derives from the work of his own laboratory. E. Stotz has given a clear account of pyruvate metabolism and F. Schlenk of the enzymatic reactions in which nicotinamide and related substances are involved in Volume V; V. A. Engelhardt has dealt with the adenosinetriphosphatase properties of myosin and F. Lipmann with acetyl phosphate in Volume VI. F. H. Johnson has discussed bacterial luminescence in Volume VII. These papers are all strictly within the field of enzymology.

However, the editor obviously interprets the extent of this field in the broadest terms and several of the reviews deal with topics that many would regard as straightforward biochemistry. For example, K. C. D. Hickman and P. L. Harris have discussed the biochemical interrelationships of tocopherol in Volume VI in a paper that is by far the clearest and most interesting account of this complex and difficult subject that has come to the reviewer's attention. Volume VII contains accounts of asymmetric synthesis by P. D. Ritchie, of hemoproteins by H. Theorell, and of the chemistry of tetrapyrroles by S. Granick and H. Gilder. However, G. Hevesy's outstanding review of the application of radioactive indicators in biochemical problems does indeed deal with reactions strictly within the field of enzymology.

Several of the reviews are concerned with topics allied with technology. In Volume VI, W. G. Frankenburg has discussed the chemical changes that take place in tobacco leaves during the process of curing, and W. F. Geddes the significance of the amylases of wheat in milling and baking. In Volume VII, F. M. Hildebrandt gives a review of industrial fermentation research in recent years.

On the whole the volumes under review are almost essential equipment for the present day biochemical laboratory. They are a mine of authoritative information. However, there is another side of the picture. Publishing costs of books are high and the marked advance in price and increase in size of the volumes means that an increasingly serious load is thrown upon the individual who feels that he must maintain his subscription to the series. To be sure, scientific journals have also increased their price, but not in the ratio of \$5.50 to \$8.75. The publishers would do well, therefore, to make every effort to diminish the cost of these volumes in the future, even if sacrifices in the length of the articles or in style of publication must be made.

H. B. VICKERY

BOOKS RECEIVED

January 10, 1948-February 10, 1948

- JEROME ALEXANDER. "Life, Its Nature and Origin." Reinhold Publishing Corporation, 330 West Forty-Second Street, New York 18, New York. 291 pp. \$5.00.
- J. J. BIKERMAN. "Surface Chemistry for Industrial Research." Academic Press Inc., Publishers, 125 East 23rd Street, New York, New York. 464 pp., \$8.00.
- R. E. BURK AND OLIVER GRUMMITT. "Frontiers in Chemistry, Volume V. Chemical Architecture." Interscience Publishers, Incorporated, 215 Fourth Avenue, New York 3, New York. 202 pp. \$4.50.
- H. EILERS, R. N. J. SAAL, AND M. VAN DER WAARDEN. "Chemical and Physical Investigations on Dairy Products. Monographs on the Progress of Research in Holland." Elsevier Publishing Company, Inc., 215 Fourth Avenue, New York 3, New York. 217 pp.
- C. J. GORTER. "Paramagnetic Relaxation." Elsevier Publishing Company, Incorporated, 215 Fourth Avenue, New York 3, New York. 127 pp. \$2.25.
- T. H. JAMES AND GEORGE C. HIGGINS. "Fundamentals of Photographic Theory." John Wiley and Sons, Incorporated, 440 Fourth Avenue, New York 16, New York. 286 pp. \$3.50.
- ALEXANDER S. LEVENS. "Nomography." John Wiley and Sons, Incorporated, 440 Fourth Avenue, New York 16, New York. 176 pp. \$3.00.
- H. MARK AND E. S. PROSKAUER. "The Science of Plastics. Volume I." Interscience Publishers, Incorporated, 215 Fourth Avenue, New York 3, New York. 632 pp. \$9.00.
- MELVILLE SAHYUN. "Proteins and Amino Acids in Nutrition." Reinhold Publishing Corporation, 330 West Forty-Second Street, New York 18, N. Y. 566 pp. \$7.50.
- RALPH L. SHRINER AND REYNOLD C. FUSON. "The Systematic Identification of Organic Compounds." Third Edition. John Wiley and Sons, Incorporated, 440 4th Avenue, New York 16, New York. 370 pp. \$4.00.
- J. L. SNOEK. "New Developments in Ferromagnetic Materials. Monographs on the Progress of Research in Holland." Elsevier Publishing Company, Incorporated, 215 Fourth Avenue, New York 3, New York. 136 pp. \$2.50.
- FRANK J. WELCHER. "Organic Analytical Reagents. Volume IV." D. Van Nostrand Company, 250 Fourth Avenue, New York. 624 pp. \$8.00 (\$7.00 series orders.)
- "Selected Values of Properties of Hydrocarbons." (Circular of the National Bureau of Standards C46). Prepared as part of the work of the American Petroleum Institute Research Project 44 by Frederick D. Rossini, Kenneth S. Pitzer, William J. Taylor, Joan P. Ebert, John E. Kilpatrick, Charles W. Beckett, Mary G. Williams and Helene G. Werner. For Sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 483 pp. \$2.75.