Organic analytical reagents. (Vol. II.) Frank J. Welcher. New York: D. Van Nostrand, 1947. Pp. xi + 530. $8.00.

This is the second volume in a series of four dealing with the use of organic compounds as analytical reagents. The first volume was reviewed in this journal (July 18, 1947, p. 72). The general style and arrangement are the same as in Volume I: the formula, molecular weight, Beilstein reference, properties, and method of preparation are given for each reagent, as well as references to the original literature.

Volume II includes chapters on "The Organic Acids" (89 pp.), "Halogen Substituted Acids" (4 pp.), "Hydroxy Acids" (94 pp.), "Amino Acids" (32 pp.), "Miscellaneous Acids" (10 pp.), "Acyl Halides" (3 pp.), "Acid Anhydrides" (4 pp.), "Esters" (8 pp.), "The Amines" (256 pp.), and "Quaternary Ammonium Compounds" (12 pp.). The book concludes with an index of names and synonyms of the organic analytical reagents treated in the text, and one on their uses, the compounds being listed alphabetically under the element or radical for which they are employed in analytical procedures. The large number of amines used as analytical reagents is indicated by the 256 pages (almost half the volume) comprising the chapter devoted to this type of compound.

The book is conveniently arranged for ready reference and, together with the companion volumes in the set, will make a useful and up-to-date treatise on organic analytical reagents.

JOHN H. YOE

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A concise comparative anatomy. William Henry Atwood. St. Louis: C. V. Mosby, 1947. Pp. 413. (Illustrated.) $5.50.

Perhaps many victims of the paper blizzard, that modern visitation which silently builds its drifts on doorstep and table, have wearily reflected that the struggle would be easier if words were used qualitatively rather than quantitatively. Prof. Atwood's book is not brief—it has 413 pages bearing 303 illustrations—but it is admirably concise.

Following introductory chapters on such topics as terminology, classification, and embryology, the material is presented on the basis of morphological systems. Each chapter includes both a general discussion of a system and analyses of the system as it is represented in familiar chordates. The histology of many structures is briefly presented. Phylogeny is emphasized. There are numerous summaries, tabular and otherwise. The subject matter is presented in a clear, well-organized, and interesting manner. The illustrations are more than adequate but vary somewhat in quality. The legend (p. 350) for the picture of the human kidney and suprarenal fails to state that the lobulated kidney and relatively large suprarenal gland are not characteristic of the adult.

The text is further supplemented by a glossary, a bibliography of British and American titles, and an index. The latter is detailed but falls short of the ideal anatomical reference index in which all named structures are listed.

This volume should be of value as an elementary textbook and as a brief reference work.

THOMAS R. FORBES

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Die genauen Methoden der astronomisch-geographischen Ortsbestimmung. Th. Niethammer. Basel, Switzerland: Verlag Birkhäuser, 1947. Pp. 181. (Illustrated.)

This volume concerns primarily those methods of determining time, latitude, azimuth, and longitude which do not require the precise measurement of a vertical or a horizontal angle. An exception is made in the case of the determination of azimuth, where one method involving the measurement of an angle in the horizontal plane is offered. This approach permits the precise determination of time, longitude, latitude, and azimuth with instruments whose divided circles have not been investigated with great care. Among others, the methods of Pewzow, Doellen, Zinger, and Horrebow-Talcott are presented.

The author is professor of astronomy at the University of Basel and an expert in the field on which he writes. He presents in each case the basic mathematical derivations, including differential expressions which give the errors of the quantities sought in terms of the errors of the observed or given quantities. For each of the principal methods presented, a numerical example is worked out in detail.

Only 6 pages are devoted to the determination of difference of longitudes. There is considerably less on the instruments used than is customary in American books in this field. There are relatively few illustrations. Regrettably, there is no index, but only a table of contents.

This volume will supplement quite well the authoritative American reference volume, *Determination of time, longitude, latitude and azimuth* (5th ed.), Special Publication #14 of the U. S. Coast and Geodetic Survey, Department of Commerce.

CHARLES H. SMILEY

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Radar system engineering. Louis N. Ridenour. (Ed.) New York-London: McGraw-Hill, 1947. Pp. xviii + 748. (Illustrated.) $7.50.

This book, the first volume of the MIT Radiation Laboratory series on radar, represents an attempt to present in a coherent manner the information pertinent to the over-all design of a radar system. It is the result of a joint effort by a number of authors under the editorial supervision of Louis N. Ridenour, and the material is drawn from a variety of sources.

Those portions of the book which deal with basic matters are well written and are of permanent value. In these sections, the emphasis is on the "why" rather than on the "how" of system engineering. Material of this type is given in the chapters on the radar equation, prop-

erties of targets, the limitations of pulse radar, and parts of the chapters on C-W radar systems, beacons, and moving target indication. The chapter on targets is enlivened by a set of photographs, reasonably well reproduced, of radar screens depicting mountains, cities, bridges, railroads, coast lines, rivers, and finally, a typhoon complete with an "eye."

A second group of chapters is devoted to material on components and on complete systems to illustrate the application of basic principles. The major part of the book is taken up in this manner, and if the treatment appears to be quite lengthy and even tedious at times, it is no fault of the authors but rather arises from the complexity of radar itself. On any given topic, such as magnetrons and pulsers, the treatment is adequate for the person who wishes a bird's-eye view of the subject but is not detailed enough for the tube or modulator designer. All of the specialized topics such as antennas, receivers, indicators, power supplies, and so on, are handled with the needs of the systems designer in mind, and the specialist will have to wait for fuller descriptions promised in the succeeding 27 volumes in the series.

In the opening chapter the editor takes a quick dip into the early and somewhat controversial history of radar. Not everyone will agree that he is completely objective in characterizing the early work of the Army and Navy as marked by "total failure, and qualified success." Also, the editor could perhaps have improved his treatment of the Radiation Laboratory's 1.25-cm program by giving more fully the background of the troublesome absorption by atmospheric water vapor. How this absorption was calculated, subsequent to the development of equipment, from information in the 1937 tables of the energy levels of water employing known methods in spectroscopy is an intriguing topic, and one of undoubted importance to the systems engineer.

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Foundations of algebraic geometry. (American Mathematical Society Colloquium Publications, Vol. XXIX.) André Weil. New York: American Mathematical Society, 1946. Pp. xix + 289. $5.50.

The formulation of the theory of algebraic varieties on a strictly algebraic foundation, begun by van der Waerden and developed in a more advanced sphere by Zariski, is a development of profound significance for algebraic geometry and, indeed, for all mathematics, and the present volume, as the first book on the subject apart from van der Waerden's *Einführung in die algebraische Geometrie,* is an event of great importance. The developments referred to have three main objectives: first, to lay the foundations of the subject on a rigorous basis; secondly, to extend its scope; and thirdly, to provide the researcher with more powerful weapons than he has hitherto had at his disposal. With regard to the first of these, it need only be said that Prof. Weil need fear no criticism from the most pedantic of rigorists. But let us see how the book meets the remaining needs.

The main purpose of the book is to give a rigorous account of the intersection theory of algebraic loci, but in order to do this, the theory of varieties required is developed *ab initio*. Varieties are defined over any ground field, but Weil's definition includes two major restrictions: the varieties are required to be absolutely irreducible, and their function fields are assumed to be separable extensions of a pure transcendental field. These restrictions are, of course, entirely acceptable to classical geometers who take the field of complex numbers as ground field, but some modern writers have dealt with varieties not satisfying these restrictions. Nevertheless, this volume carries the subject further in the field which it covers than has ever been done before for such a wide choice of ground field. On the other hand, the provision of a variety of methods is not the object of the book, and though it demonstrates the ample power of the methods employed, which may be new to many, certain of the tools used by others, notably valuation theory, are entirely excluded. This is quite allowable in a book whose object is to expound a theory and not to describe methods, but certain views are expressed on other methods on which opinions may differ; in particular, the reviewer disagrees with the author in his opinion of the usefulness of elimination theory.

The book will be of immediate and absorbing interest to those who are already following the modern developments in algebraic geometry. A complete and rigorous account of intersection theory, established with the generality which Weil allows himself, is in itself a great achievement, but the careful reader will find much in the detail which will prove of great value in other branches of algebraic geometry. After a preliminary chapter establishing some general theorems on field extensions, there are two chapters devoted to Specialization (van der Waerden's *Relationstreuespezialisierung*) in which will be found a large number of new results which greatly add to our understanding of this concept. In the fourth chapter the concept of an algebraic variety is introduced, and the main properties of join, intersection, and algebraic correspondence are developed. Then follow two chapters which deal exhaustively with the ideas of intersection multiplicity, the central theme of the whole book; the work in this is without doubt destined to be the authoritative version of this subject for years to come. In these chapters the variety is regarded as in affine space, and the next chapter has the effect of extending the theory to projective space. This is not, however, done in the usual way; rather, borrowing from topology the idea of defining a manifold by overlapping neighborhoods, he considers the variety in projective space as defined by the aggregate of varieties in affine space which can be derived from it by different choices of the hyperplane at infinity. The book concludes with a chapter on functions and divisors, and a most stimulating chapter entitled "Comments and Discussions," to which many will have frequent recourse for inspiration.

On the other hand, the nonexpert—even the geometer who has remained completely loyal to the classical tradition—will undoubtedly find the book a puzzling one, for