standards; apart from the readers who have learned to rely on their judgment they are responsible to nobody but their publishers and themselves. In this respect Part II is somewhat similar to the Extra Pharmacopœia and the resemblance is made closer superficially by the practice adopted throughout the book of giving literature references to the authority for many of the statements made. This practice differs from that adopted in the Extra Pharmacopœia where a number of published papers may be summarised and the reader left to form his own opinion from the results reported. Another detail in which the Dispensatory differs from the Codex and Extra Pharmacopœia is in the way doses are stated. Instead of a simple statement of the usual range of doses the Dispensatory monographs commonly end with a paragraph stating the maximum single dose and the maximum daily dose, with any other relevant information. The British practice can be defended on the ground that it enables a dispenser rapidly to check whether a prescribed dose is within accepted limits; on the other hand, the activity of modern synthetic organic compounds often calls for more precision in dosage. Although comparable information is no doubt readily available in the body of the Codex monograph, it is convenient to be able to find it in a standard position.

The 25 editions of the Dispensatory have reflected progress in therapeutics over a period of more than 120 years, for it first appeared in 1833. Such a record of continued service to medicine and pharmacy establishes a tradition which imposes high responsibility on those who now attempt to survey the vast field of therapeutic agents. The new edition is the work of Dr. Arthur Osol, of the Philadelphia College of Pharmacy and Science, and Dr. G. E. Farrar, of the Temple University School of Medicine, with 6 colleagues and 20 collaborators. They have adequately discharged the responsibility and have earned the gratitude of all who want a comprehensive guide to the substances a pharmacist may be called upon to supply.

H. TREVES BROWN.

BOOK REVIEWS

BENTLEY AND DRIVER'S TEXT-BOOK OF PHARMACEUTICAL CHEMISTRY. Sixth Edition. Revised by J. E. Driver. Pp. viii + 751 (including Index). Oxford University Press, London, 1955. 55s.

Much of the character of the earlier editions of Bentley and Driver is retained in the new sixth edition, which none-the-less has undergone extensive revision. The need to include both inorganic and organic chemistry as well as a fairly extensive introductory section on analytical methods has led, as in the earlier editions, to a good deal of compression. This undoubtedly detracts from the value of the book. A high standard is reached in the presentation of the section on analytical methods, and chapters on gravimetric analysis, hydrogen ion concentration and pH determination have received more than adequate treatment. On the other hand the discussion on photometric methods, whilst providing a readable introduction to the subject, is disappointing and quite inadequate to the requirements of degree students. Again, whilst it is not disputed that the limit tests for arsenic, lead, chloride, sulphate and iron are of more general importance than any other single test, it seems a pity that the

chapter has not been extended to include a general treatment of other limit tests for metallic and non-metallic impurities, limits of moisture, residues on ignition, etc. Part II provides an excellent description of all the more important groups of inorganic compounds, which are useful in pharmacy and medicine. The system of classification used is in part based on periodic considerations, but it is regrettable that there should be so little mention of periodic relationships in individual chapters, and that the periodic table itself should have been relegated to an appendix. This in no way underestimates the value of the factual information which undoubtedly is well presented, but failure to make full use of systematic inorganic chemistry is a serious drawback. Part III which forms the major part of the book is mainly devoted to a broad general treatment of organic chemistry, with special reference to pharmaceutical substances. An introductory section presenting general aliphatic and aromatic chemistry is clearly presented, calling for little comment. The special chapters on oils, fats and waxes, and on the fundamental chemistry of heterocyclic compounds, are disappointing. Similarly in the more specialised chapters which follow, some remarkably clear and useful accounts on such topics as antibiotics and barbiturates are interspersed with others which are equally remarkable for the lack of important detail. The two-chair conformation for *cis*-decalin is now well established, and even allowing for the delay in reaching the press there can be little excuse for its continued representation as the two-boat conformation shown on page 535. The text is remarkably free from misprints, though the misrepresentation of piperidine on page 573 as *cyclo*hexane is one exception. The book is suitable for students studying for the pharmaceutical chemist diploma, and will provide a useful introduction for degree students.

J. B. STENLAKE.

METHODEN DER ORGANISCHEN CHEMIE (Houben-Weyl). Fourth Edition. Edited by Eugen Müller. Volume IX, Schwefel-, Selen-, Tellurverbindungen. Pp. xxxi + 1337 (including Index). Georg Thieme Verlag, Stuttgart, 1955. Moleskin: DM.218.00.

Volume IX has been compiled from a truly comprehensive series of monographs covering the organic chemistry of sulphur, selenium and tellurium. As might be expected, the greater part of the volume is devoted to the sections on sulphur compounds, which have been studied much more extensively than those of either selenium or tellurium. Individual chapters have each been compiled by a single expert or group of experts, and follow the now familiar pattern of this series. Descriptions of all known preparative methods are given with detailed explanatory instructions for the preparation of specified examples of each type. Yields and numerous references to a wide range of cognate preparations are also listed, being tabulated wherever possible for easy reference. In fulfilment of the aims of this series, the major emphasis throughout is on the provision of a comprehensive account of preparative methods, so that whilst each chapter concludes with a description of properties this is in every case subordinated to the main purpose. For those interested in this branch of organic chemistry, the volume provides a most excellent review not only of well known groups of aliphatic and aromatic sulphur compounds, but also of some of the less familiar types such as ethylene sulphides, sulphenic acids, thiosulphinic and thiosulphonic acids, thioaldehydes, thioketones and thioacids. The single chapter on selenium and tellurium is similarly subdivided and provides the first comprehensive literature survey of its kind in this branch of organic chemistry. The last short chapter on nomenclature of sulphur compounds is a most

useful contribution. Literature and patent references are complete to the end of 1954, although some reference to later work is also included. The extent and seeming completeness of the index, covering both authors and subjects, may be gathered from the fact that it extends over a total of 120 pages. Like many of the earlier volumes in this series, the present one is a reference book for the specialist. Clarity in layout and detailed presentation of information make Volume IX a "must" for any organic chemical library.

J. B. STENLAKE.

(ABSTRACTS *continued from page* 362.)

benzoic acid and myo-inositol was investigated. The *Mycobacterium* was grown on Long's medium; myo-inositol-adapted cells were grown on medium with myo-inositol replacing glycerol. Analogues when present were at a concentration of 1·0 mg./ml. The effect of the drugs on substrate oxidation was measured by conventional Warburg techniques. Cells grew normally in the presence of the analogues (cf. antibiotics) and endogenous respiration was the same as control. The addition of the purine analogues, 6-mercaptopurine and 2:6-diaminopurine, and the pyrimidine analogues, 5-aminouracil, 5-methyl-2-thiouracil, 6-methyl-2-thiouracil, 2-thiocytosine, and 2-thiouracil, inhibited the formation of adaptive enzymes for the oxidation of benzoic acid in this mycobacterium. 2-Thioorotic acid had no effect. The addition of the purine analogues, 6-mercaptopurine and 2:6-diaminopurine, and the pyrimidines, 5-aminouracil, 5-methyl-2-thiouracil, 6-methyl-2-thiouracil, and 2-thioorotic acid, inhibited the formation of the adaptive enzymes for the oxidation of myo-inositol. 2-Thiouracil had no effect. Inhibition by 5-methyl-2-thiouracil, the most effective of the analogues in both cases, was reversed by thymine (1·0 mg./ml.), but not by uracil in the same concentration. Analogue-grown cells oxidised trehalose and glycerol normally: the drugs would appear to affect preferentially adaptive enzyme formation. G. P.

Quaternary Ammonium Compounds, Bacteriostatic and Bactericidal Effect of. O. G. Clausen *Medd. Norsk. Farm. Sels.*, 1955, **17**, 124.) Tests were carried out to compare the bactericidal and bacteriostatic effects of benzalkonium chloride and benzethonium chloride with that of phenol. A series of ærobic and anærobic bacteria were used as test organisms, and also a series of natural inocula (suspension of normal fæces, sputum suspension and dust suspension) were employed in the tests. *Pseudomonas æruginosa* and *Clostridium welchii* were the most resistant organisms encountered in the bacteriostatic tests, while *Bacillus subtilis*, *C. welchii* and suspension of dust were the most resistant materials in the bactericidal determinations. Phenol coefficients were determined, using a 2 per cent. oil-soap solution as an inactivating agent for the quaternary compounds. The results for benzalkonium, benzethonium and cetylpyridinium chlorides and cetrimide using this method of inactivation were lower than those previously reported. It is suggested that *Ps. æruginosa* should be adopted instead of *Salmonella typhosa* as the standard organism for the determination of phenol coefficients. G. B.