

synaptic transmission by G. H. Bishop, the somatic functions of the central nervous system by A. E. Walker and the visceral functions of the nervous system by K. Hare can all be commended as critical and stimulating reviews. Hare's article is particularly valuable in developing the modern view that there is no functional antagonism between the sympathetic and parasympathetic systems. Developmental physiology by L. B. Flexner records further rapid growth in this new field, and it is interesting to note that the *in vitro* fertilization of human ova has been reported.

R. F. Pitts presents an excellent review of the kidney. In renal physiology attention continues to be focused on the use of clearance methods for the measurement of glomerular filtration rate, renal blood flow and tubular activities. The concept of competition for secretory and reabsorptive mechanisms in the renal tubules has proved very fruitful. The use of *p*-aminohippurate, which competes with penicillin for a secretory mechanism and so reduces urinary loss of penicillin during therapy, is an important practical outcome. Perhaps the most striking advances are in the review of the lymphatic system, where O. Cope and L. Rosenfeld deal with the relation of endocrines to the lymphatic system, the remarkable changes which occur in the 'alarm reaction' of Seyle, and the pituitary-adrenal control of the release of protein from the lymphocytes. In metabolic functions of the endocrine glands, E. W. Dempsey confines himself to certain new aspects of endocrinology, notably the relation of hormones to enzymes, hormone inhibitors and hormone antibodies. In physiological psychology, R. H. Seashore prefaces his survey of current literature with a general account of the principles and problems of this subject, for which the ordinary physiologist will be very grateful. In pharmacology, M. L. Tainter, L. C. Miller and T. J. Becker have concentrated on enzymes, dealing with the action of drugs on enzyme systems and the all-important subject of substrate competition. A short review of shock by M. I. Gregerson presents the considerable changes in outlook which have resulted from the Second World War and provides a most intelligible account of this difficult subject. Other subjects reviewed are effects of ultra-violet radiation, physiological aspects of genetics, and audition.

It is interesting to observe that most of the advances in fundamental physiology during the past two years have arisen directly or indirectly from the war-time study of problems in applied physiology.

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CHROMATOGRAPHY FOR BEGINNERS

An Introduction to Chromatography

By Dr. Trevor Illtyd Williams. Pp. xi+100+8 plates. (London, Glasgow and Bombay: Blackie and Son, Ltd., 1946.) 12s. net.

BOOK that states its objective in the preface, that precisely fulfils it in ninety-six crisply written pages, must be warmly commended. The objective, though limited, is worthy—"to provide a readable and descriptive account of chromatography", primarily for university students. Unlike the two earlier books on the subject, the first by

Zechmeister and Cholnoky (translated by Bacharach and Robinson), the second by Strain, this one makes a deliberate selection of the available material, instead of presenting the lot in bewildering completeness. The result is a reasonably well-balanced account, with the emphasis upon technique and potentialities rather than upon past achievements. The reviewer was pleasantly surprised to find one after another of his pet tricks of technique described, until there was little left to quibble about. The frequent cross-references to other pages will also be very useful to a student using the book as a guide to practical work. Moreover, the author has not been content to select his examples from the older literature; for example, a whole chapter is devoted to the elegant techniques of partition chromatography on damp silica, starch, or strips of filter-paper, developed since 1941 by Martin, Synge, Gordon and Consden.

The chief criticism to be made of the book is that scarcely any indications are given of the capacities of adsorbents until Chapter 8, where most of the examples concern columns very much larger than students would normally employ. It would have been more helpful to include experimental details for a short series of practical exercises. Besides being of direct value to the student, these would have served as useful guides to the research worker needing to attempt similar separations. The point might have been made that only the powerful adsorbents will hold as much as 1 per cent of their own weight of adsorbed material—which is of great advantage in micro-analysis but a nuisance in preparative work. Another practical tip worthy of mention, even in an elementary text-book, is the advantage usually to be gained in sharpness of separation by applying the solute in fairly concentrated rather than dilute solution; also the value of *short* columns of alumina or charcoal—on Buchner funnels even—for removing the most strongly adsorbed component from a mixture, notably tar from organic preparations.

Dr. Williams deplors the term 'chromatography'. However, it is far too late to change it now, and after all it is a nice colourful word, descriptive either directly or indirectly of much of the art. For if the substances to be separated are initially colourless, one does one's best to get colours from them by putting indicators on the column (partition chromatography of acids; quenching of fluorescence by adsorbed substances), by viewing the column in ultra-violet light, or by applying colour reactions to eluates or to the column itself (streak method). In any event, the author's alternative, 'adsorption analysis', at once excludes what promises to become at least as important, namely, partition chromatography. If we really need a new term it should be one that emphasizes the *principle* involved in these separations on columns, namely, the repeated equilibrations of successive elements of one phase with successive elements of another, as in the analogous liquid-vapour fractionating columns. Authors of text-books on chromatography might not then turn a blind eye to another subject that should legitimately be included, namely, the manifold uses of natural and synthetic ion-exchange materials.

To extract materials from a column Williams 'elutes' it, whereas Strain felt obliged to 'elutriate' it. Williams (in conformity with the English translation of Zechmeister) calls the eluting agent the 'eluent'; in this instance, and for no logical reason, I prefer the American variant 'eluant'.

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