Letters to the Editor

Cholesterol Determination on the SMA12/60

A Technicon SMA12/60 has been in routine use in this department for the past six months. Our evaluation of the equipment has been reported at the Technicon Symposium held in London in November 1969, and will be published together with the other papers presented there.

Since that date we have experienced some difficulties with the cholesterol channel which resulted in our having to discard many results. These difficulties were (a) blockage at the metal nipple through which the sample is injected from the Tygon phasing coil into the stream of Liebermann-Burchard reagent; (b) attack on the final six inches of the phasing coil by the reagent; and (c) carryover between specimens caused by the length of the phasing coil itself.

Blockage at the nipple, which was the most troublesome difficulty, was obviated by increasing the dilution of the sample. The tube carrying Liebermann-Burchard reagent was altered from 0.073 (green) to 0.081 (purple); to compensate for this the cholesterol flow-cell pump-back tube was altered from 0.065 (blue) to 0.073 (green).

Attack on the phasing coil was eliminated by removing the 0.20 Tygon phasing coil from its position immediately before the cholesterol cartridge to a position between the PT-13 cactus and the pump, and by inserting a short length of polythene tubing (0.015 ID $\times$ 0.043 OD) between the end of the sample tube and the sample injection nipple.

Carryover between specimens was thought to be aggravated by lack of sufficient air between diluted samples in the phasing coil. This was overcome by (a) decreasing the volume of air taken off at the A-4 debubbler by changing the air take-off tube from 0.030 (black) to 0.025 (orange/white), and (b) switching the positions at which calcium and cholesterol samples were taken off at the PT-13 cactus so that the cholesterol sample was taken off vertically.

At the end of each day, an 8% solution of bleach (Domestos) is aspirated for 15 minutes via the sample probe while other lines are pumping water; the sample probe is then placed in water and

rinsing continued for a further period of 15 minutes.

During the five weeks since these changes were made the cholesterol channel has remained trouble-free. A control serum with a mean cholesterol concentration of 76.1 mg/100 ml shows a standard deviation of 3.3 mg/100 ml ($N = 301$).

A. MITCHELL

Biochemistry Laboratory, Royal Victoria Hospital, Belfast, Northern Ireland

Urinary Mercury

Interest in the determination of urinary mercury is increasing, judged by the number of papers recently appearing on this subject and by the number of requests for this investigation received by this laboratory.

There is a real need for a simple and rapid method for the determination of mercury in biological samples for the general laboratory. Most of the earlier procedures require the preliminary oxidation of organic matter under conditions which prevent loss of mercury. This is time consuming and tedious. Four such methods were reviewed by Goldberg and Clarke (1970) in your March issue (23, pp. nos. 178-184). Lindstedt (1970) has recently developed a rapid method using atomic absorption spectrophotometry but previous digestion is still needed.

It might be helpful, therefore, to draw attention to the simple method described by Magos and Cernik (1969) where no digestion is required and the whole procedure takes only a matter of minutes. In brief the technique is to convert mercury into a volatile form which is then estimated by an ultraviolet photometer. An estimation only takes a couple of minutes and no special skill. Although designed primarily for inorganic mercury the method has recently been adapted successfully for organic compounds by Gage and Warren (1970). We have used no other method in this laboratory for over two years in the supervision of workers exposed to mercury with complete satisfaction and a great saving of time and effort.

M. H. P. SAYERS

Medical Laboratory, HM Factory Inspectorate, Baynards House, 1-13 Chepstow Place, Westbourne Grove, London W2

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Blood Levels in Acute Barbiturate Poisoning

Gillett and Warburton (*J. clin. Path.*, 23, 435, 1970) conducted a survey of blood levels in allegedly proven cases of acute barbiturate poisoning. To quote their own words 'the coroner's question "was death due to barbiturate poisoning?" must be answered by reference to the blood levels known to cause unconsciousness'. I disagree. As the authors have done me the honour to quote figures from my book, albeit incorrectly dated, may I refer them to the second edition, pp. 65-67, 121-2, and 126-128.

The difficulties of using only blood are emphasized in one case of mine in which the blood quinalbarbitone level was 0.8 mg/100 ml and there was clear circumstantial evidence that the deceased had been alive and well 10 minutes before he was found dead. In this case there was 30 mg/100 g in the liver and 2 g in the stomach contents!

In my opinion the coroner's question will be much more correctly answered if consideration is given to the results of analyses of blood, liver, and stomach contents.

A. S. CUREY

Director, Central Research Establishment, Aldermaston, Reading

Book reviews

Functional Pathology of the Human Adrenal Gland By T. Symington. (Pp. xvi + 551; illustrated. £10). Edinburgh and London: E. and S. Livingstone. 1969.

In the first part of this monograph Symington himself deals with the adrenal cortex. There are detailed sections on embryology, the foetal gland, blood supply (including interesting original work), and innervation: but it is in

the accounts of hormonal control, histochemistry, and the zonal arrangement of hormone synthesis that the author's enthusiasm comes through most clearly, while the 30 or so pages devoted to the physiology of adrenal cortical hormones provide an unusually lucid survey of this difficult subject.

This impressive build-up is followed by fully documented and illustrated descriptions of the structural and functional pathology of the adrenal cortex in stress and in generalized disease, and by full accounts of cortical tumours, hypercorticalism, and hypocorticalism. In all these full attention is accorded to disturbed biochemical mechanisms, and the section ends with an account of the technical and chemical methods used in the studies quoted.

Part II deals with the adrenal medulla and has been contributed by A. M. Neville. It follows the same general pattern as the part on the cortex and includes particularly valuable sections on the biochemistry of the medullary hormones and on their measurement in tissues and body fluids. The account of pheochromocytoma is particularly valuable.

Part III, again by Dr Neville, covers the chemoreceptor system and is quite brief. It provides a useful account of function and pathology in this odd collection of organs linked to the adrenal by the demonstration of catecholamines in the normal carotid body and in some of its tumours.

The fourth part takes the form of an annotated atlas of human adrenal cortex ultrastructure, contributed by A. Mackay. Eighty high quality electronmicrographs of normal and abnormal cortical tissue are elegantly reproduced, and Dr Mackay concludes with a reminder of the essentially qualitative nature of this type of study. He warns that the electron microscope shows that the tissue slices and homogenates from which much of our knowledge of steroid biosynthesis has been obtained have much greater structural heterogeneity than had been suspected by light microscopy.

The final part, by D. P. Cuthbertson and W. J. Tilstone, is on the metabolic and hormonal response of the body to injury and includes an account of wound healing. This section is only marginally relevant to the main subject of the book but provides an interesting application of some of the principles derived from the first part.

This beautifully produced volume forms the culmination of the work that Professor Symington and his colleagues at the Royal Infirmary, Glasgow, have lavished on the adrenal gland over a period of some 15 years. Within the limits of its subject the

book is extraordinarily comprehensive and there can be little doubt that we have here what will remain the standard reference book on adrenal pathology for many years.

T. CRAWFORD

Spezielle pathologische Anatomie Edited by W. Doerr, G. Seifert, and E. Uehlinger. Vol. 4. (Pp. xviii + 655; 275 figures. DM146.00.) Berlin, Heidelberg, and New York: Springer-Verlag. 1969.

The increasing specialization in pathology has been reflected in a wide demand for textbooks dealing with the special pathology of different organs.

The superbly produced book under review forms part of an encyclopaedia of 'special morbid anatomy' edited by three eminent pathologists—Doerr and Seifert from Germany and Uehlinger from Zürich. In this fourth volume, the following organs have been dealt with by three authors: 'Nose and paranasal sinuses and larynx and trachea' (both by Professor K. Köhn, Berlin), 'The thyroid' (by Professor B. Walthard, Berne), and 'The mediastinum' (by Professor C. Foboese, Salzburg).

It is difficult to consider in detail the wealth of relevant information presented. The extent and depth of the volume is illustrated by the long list of references after each chapter; for example, 40 pages after chapter I; 44 pages after chapter II.

The loyalty to the authors of the 'old school' is reflected in the chronology of the references, few of which are from the more recent literature. The name of Senturia is misspelt (p. 115).

It is not easy in the framework of this review to deal with the considerable differences in the terminology and classification used in this book. Ignoring the language barrier, this might replace the wider usefulness of this most competent book to British pathologists.

The terminology of midline granuloma of the nose remains confused (p. 831). The clinical term 'granuloma gangrenescens' seems to be preferred by continental authors. The vexed question of premalignant lesions of the vocal cord will not be helped by using Virchow's hallowed term 'pachydermia' (p. 258). The classification of malignant neoplasms of the thyroid (pp. 394 and 345) is based, in the author's words, on the great morphological variation of these tumours in the 'struma country' of Switzerland. Medullary carcinoma is not included. The chapter on the mediastinum is comprehensive and informative and will appeal to the chest physician and surgeon.

For the specialist, this well produced and competent book will provide a useful source of reference. I can also recommend it wholeheartedly to German-speaking postgraduate candidates of the Royal College of Pathologists.

The fine illustrations are representative and helpful, although less numerous than might be expected, including only three electron photomicrographs. The price, though reasonable, is fairly high.

I. FRIEDMAN

An Atlas of Haematological Cytology Edited by F. G. J. Hayhoe and R. Flemans. (Pp. 320; 349 colour figures. 60s.) London: Wolfe Medical Books. 1969.

This 'Atlas of haematological cytology' promised to be exceptional because of the earlier contributions of the authors to cytochemistry in relation to haematology. As produced it is a small, thick, compact book with up to four colour figures on each page and the descriptions on the opposite page. As far as the subject matter goes, the illustrations are excellently chosen, and cover most of the cells which may be seen in the blood and marrow. Nevertheless, the book is disappointing in two essentials.

First, the colour is so variable throughout that efforts must be made to obtain more standard colour matching in any future edition. The background staining varies from a sickly green in Figure 1 to a jaundiced yellow on the second page, to a deep mauve in some of the larger magnifications. This is not good enough for an atlas. It surely must mean that the colour of the cells is also extremely varied.

The second point is in relation to the sizes of the illustrations. In the introduction, the lens system and magnifications are described showing how the final enlargements in the atlas vary from $\times 350$ to $\times 1,600$ but a range of eight magnifications is too great for this sort of atlas. It is easy enough for an experienced haematologist to accept all these variations and computerize in his mind the sizes which they represent, but to the learner, either the young haematologist or technician, it is difficult to relate these sizes to the things he sees under the microscope. This is perhaps particularly noticeable when two or more sizes of magnification are used on the same page.

In spite of these two important objections, the book comes up to expectations in providing a reference atlas of haematological cells which will certainly be used by the majority of trainee haematologists.

A. G. SIGNET