Letter to the Editor

POLYSTYRENE TUBES IN CLINICAL CHEMISTRY WITH SPECIAL
REFERENCE TO IRON

Some manufacturers claim that polystyrene test tubes which are intended to be used once only, have the additional advantage of being chemically clean.

Marks (1967), in a memorandum to the British Standards Institute made on behalf of the Association of Clinical Biochemists, proposed that sodium (or potassium) might be used as an indicator of contamination: ion-free water left to stand in the container overnight at room temperature should contain not more than one microequivalent per ml. He warned, however, that this could not be taken to imply freedom from contamination with other substances.

We were interested in the use of polystyrene tubes for iron estimation in connexion with the work of the Expert Panel on Iron of the International Committee for Standardization in Haematology. Acid washing of glassware is one of the tedious requirements for accurate iron assay.

Two experiments were carried out using pooled sera from clinical sources; iron was estimated by a modification of the method of Bothwell and Mallett (1956).

EXPERIMENT 1 The serum iron content of 29 aliquots of 2 ml were analysed in polystyrene tubes kept in a clean, paper-lined, closed drawer; 50 aliquots of 2 ml from a second pool of sera were estimated at the same time in tubes newly delivered from the manufacturer.

EXPERIMENT 2 Newly supplied polystyrene tubes were treated with 5N hydrochloric acid for six hours, rinsed three times in de-ionized water and dried overnight. Twenty aliquots of 2 ml from a third pool of sera were estimated for iron content in these tubes and a further 20 aliquots estimated in unwashed tubes from the same batch. At the same time, the sodium and potassium contamination of 20 acid-washed and 20 unwashed tubes were tested as recommended by Marks, and found to be negligible. Nevertheless, only the acid-washed tubes gave acceptable iron estimations.

In unwashed tubes serum iron values for aliquots from a common pool varied by as much as 32 μg per 100 ml; all estimations in unwashed tubes gave occasional values which were unacceptably high.

The acid-washed tubes gave the lowest range, 7 μg per 100 ml, the least standard deviation, the least variance,

Book reviews

MODERN TRENDS IN PATHOLOGY Vol. 2. Edited by T. Crawford. (Pp. vii + 323; 92 figures. 85s.) London: Butterworths. 1967.

This book opens with a critical review by A. J. Hale on modern methods of analytical cytochemistry. These include microspectrophotometry, microfluorimetry, microinterferometry, x-ray microspectrometry, and Laser-induced emission spectroscopy. He points out the advantages and necessity of combinations of techniques, gives examples of findings in this brave new world, such as measurement of spectrum of pyridine nucleotide in single cells, measurement of the total dry mass of a single red blood cell, detection of specific chemical elements in cells down to a quantity of 10^{-15} g. Hales concludes that the basic theory and techniques are known and the apparatus is available and that it only remains to apply them in pathology.

Chapter 2 by R. C. Curran gives the recent developments in the field of inflammation and repair in a detailed electron-microscope review with attention to functional as well as ultrastructural aspects. The subject is dealt with comprehensively and includes discussion of the mechanisms of fibrogenesis and the immune response. This is an invaluable, scholarly and wide-ranging account.

Chapter 3, by K. A. Porter, is a compact lucid essay on tissue transplantation that deals with the basic concepts of the mechanisms of allograft (homograft) rejection and of induced modifications of the immune response. He also describes the accompanying morpho-

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and a symmetrical distribution of results about the mean. It appears that polystyrene disposable tubes, even when free from sodium and potassium contamination, may have significant iron contamination and require acid-washing before use.

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REFERENCES

- Bothwell, T. H., and Mallett, B. (1956). *Biochem. J.*, 59, 599.
Marks, V. (1967). Memorandum submitted to British Standards Institute Sub-Committee, LBC/2/5.

TABLE

Serum Pool	Polystyrene Tube Treatment	No.	Mean	Range	S.D.	Variance (%)	No. of Tubes ($> \text{Mean} + 2 \text{SD}$)
1	Stored	29	72.0	68–100	± 5.8	8.1	1
2	New batch	50	97.8	94–106	± 3.2	3.3	1
3	New batch	20	123.8	119–136	± 4.8	3.2	2
3	Acid-washed	20	121.8	118–125	± 2.6	2.1	0