Letters to the Editor

Quality control in haemoglobin determination using the Coulter Counter S: a preliminary note

In a recent letter to the Editor, Prangnell and Johnson (1976)¹ pointed out that, using a Coulter Counter S with calibration of the haemoglobin levels against three cyanmethaemoglobin standards, the results averaged 0.5 g/dl higher than in laboratories using Coulter 4C to calibrate their machines. In the same way, Lewis (1976), in a comment on this letter, says that in the national quality control trials it has been found that participants using Coulter S produce a lower mean value for haemoglobin than when using other systems, although the difference is in the order of 0.2-0.3 g/dl; 0.5 g/dl is just within 2SD. It seems likely that these differences are due to the use of 4C as a calibrating material.

In our laboratory we use a Coulter Counter S with calibration 4C under a daily programme control described previously (Paz *et al.*, 1977). In the proficiency test service organised by the Institute for Clinical Science, Philadelphia, in December 1976, the determination requested was the evaluation of two levels of haemoglobin. Our results were very concordant, even slightly higher than the ones shown by the two samples from the organising Institute, the mean values of the reference laboratories, and the median of the participating laboratories (percentiles 10-90), as is shown in the Table.

When we checked a Technicon Multiple Haematology Reference III in our Coulter S the range found for the haemoglobin level (14.3-14.4 g/dl) showed good correspondence with the value assigned by the manufacturer (14.4 g/dl). It is interesting to note that the use of Isoton

or Isoton II as a diluent does not affect the results of haemoglobin estimation provided by the instrument (Barnard *et al.*, 1976).

We hope very soon to finish a full study of the accuracy reached in the determination of haemoglobin with the Coulter S, using 4C as a calibrator.

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Humidity and sterilisation by steam and formaldehyde

G. L. Gibson (1977), in his interesting article, states that it may be important that formaldehyde should reach the organism in conditions of comparatively low humidity. He quotes Nordgren (1939) in support of this statement. However, on checking Nordgren's monograph I find that he

comes to the opposite conclusion, namely, that bactericidal efficacy increases with the partial pressure of water vapour (page 81). On page 74 he does mention that in the 1890s 'dry formaldehyde gas' appeared to have been regarded as being 'the most powerful', but about the turn of the century opinion wheeled round in favour of moist gaseous formaldehyde. Of course, in the presence of actual water the effect becomes that of formaldehyde in solution.

The question whether dry formaldehyde works as well as moist is rather academic in the case of a low temperature steam and formaldehyde autoclave. The heating effect of steam in an autoclave is due mainly to the condensation of saturated steam, thereby giving up the latent heat of condensation of steam to the objects concerned. This creates a local vacuum which draws in further steam and accounts for the good penetration of steam in an autoclave. It follows, therefore, that moisture must be present on the objects to be sterilised.

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The author comments as follows:

Dr Edmunds' letter is very valuable in helping to elucidate one of the problems, at present exercising those interested in low temperature steam and formaldehyde. Nordgren (1939) was, of course, dealing with gaseous formaldehyde and various proportions of water vapour introduced with it, and not with steam or with temperatures above 70°C. He does certainly state that disinfection is most effective in the presence of moisture.

Table

Sample	PTS	Reference lab.		Participating lab.		This lab.	
	Assigned value	Mean	Range	Median	Range	Result	Percentile
Hb A	13.7	13.8	13.5-13.9	13.8	13.4-14.2	13.9	60
(g/dl) B	17.8	17.9	17.6-18.1	17.9	17.3-18.3	18.0	60

¹See also: Prangnell and Johnson (1977). *Journal of Clinical Pathology*, **30**, 487-491.