Letters to the Editor

Each sample was tested in duplicate.

A limited study of the within-batch precision of the assay was carried out. Using a sample containing 2,3-DPG at a level of 2.36 μmol/cm³ for eight analyses, the range of values was 2.31 to 2.39 μmol/cm³, with a standard deviation (SD) of 0.04 μmol/cm³ and a coefficient of variation (CV) of 2%. These figures are in keeping with published data.¹

Haemoglobin levels were measured by means of a Coulter Counter (model S).

RESULTS AND DISCUSSION

The results of the study are presented in the Table. It can be seen that in these subjects no significant diurnal variation was observed. We had anticipated that the haemodilution which occurs in subjects whilst in the supine position² might affect 2,3-DPG concentrations if expressed in terms of μmol/cm³ of whole blood; however, such haemodilution was not demonstrated in these subjects—Hb concentrations in the samples taken at 08.00 and 00.00 hours were very similar.

According to Hagan et al.,³ haemococoncentration is associated with movement to a standing position, and stability is not achieved for 20 min. With this in mind, our volunteers presented themselves for venepuncture immediately on rising at 08.00, but we still failed to demonstrate haemodilution in this group of subjects.

Concentrations of 2,3-DPG appeared to vary slightly with Hb concentration, but considering the precision of the assay method, the variations were so small that they were regarded as negligible. Hence we concluded that, in the small population studied no diurnal variation in 2,3-DPG was shown.

We should like to thank Professor JW Stewart and the staff of the Haematology Department for their co-operation with this study.

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References

³ Eaton JW, Brewer GI. The relationship between red cell 2,3-diphosphoglycerate and levels of haemoglobin in the human. Proc Natl Acad Sci USA 1968;61:756-60.
⁴ Sigma Technical Bulletin No 35-UV (Sigma Chemical Co, Fancy Road, Poole, Dorset BH17 7NH).

Errors in weighing when using a single-pan balance

The errors in weighing plastic vials on a single-pan balance have been noted¹ and the cause attributed to changes in the electrostatic charges on the vials when handling them with plastic disposable gloves. In the same study, smaller errors of up to 0-44 mg were found when weighing glass vials and these were attributed to general errors in weighing. The latter errors appear to be excessive.

Weighing a 10 g weight on a single-pan five-place balance (the Mettler H54AR), the maximum difference I found between any two weighings within batch was 0.01 mg (Table 1).

Using the same balance to weigh glass vials I obtained comparable precision values when plastic forceps were used to handle the vials (Table 2). Precision deteriorated however when the glass vials were handled otherwise; the worst results were obtained when the glass vials were handled with plastic gloves especially when more than minimal handling was involved (maximum weight change 0.78 mg). Plastic vials could be weighed precisely when plastic forceps were used to handle them although the error involved was larger than that found for glass vials (Table 2). Handling plastic vials with plastic gloves resulted in much larger errors (maximum weight change +2.47 mg).

Whilst the above results are in agreement with those found by Fleck et al, it would appear that the errors they noted when weighing glass vials were not due to general errors in weighing but were caused by using plastic gloves to handle the vials which presumably alters some physical characteristic of the vials such as the electrostatic charges on them. In support of this, my own experiments were designed to minimise any effect due to fluctuations in external factors such as temperature, humidity and atmospheric pressure. Furthermore different techniques of handling produced different sizes of changes in apparent weight and these

### Possible diurnal variation in 2,3-diphosphoglyceric acid

<table>
<thead>
<tr>
<th>Sample*</th>
<th>Time (h)</th>
<th>Hb (g/dl)</th>
<th>2,3-DPG (μmol/cm³)</th>
<th>2,3-DPG (%mol/gHb)</th>
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*Subjects were allocated the letters A, B, C, D and E.
changes proved to be reproducible. In addition, although the apparent weight of a glass vial changed significantly from the initial weight over a series of weighings, I noticed that if the vial was left for a few hours under the same experimental conditions, its weight would return to within experimental error of the first weighing.

Although the errors described here are for the most part small and for routine purpose would be insignificant, in accurate work they could contribute significantly to the total error. Therefore in circumstances where accurate weighing in glass vials is required, it would be worthwhile taking the above factors into consideration and avoiding the associated errors by the careful use of plastic forceps—that is, handling the vials as little as possible. As has already been pointed out the errors when weighing plastic vials can be large and again the careful use of plastic forceps can do much to reduce the errors involved.

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Reference


Effect of oxygen on the lungs after blast injury and burns

I refer to the above article in your issue of October 1981, and in particular to the description of the accident at Golborne Colliery in the second and third paragraphs of the article, which differs from that given by the report of the official inquiry. While the differences are not directly relevant to the type of injuries suffered, these do give a misleading impression of the way the pit was organised.

The correct facts as reported in the official inquiry of Her Majesty's Inspectorate of Mines are as follows:

On 18th March 1979 the fans ventilating the development heading (where the explosion occurred) were stopped to cater for a planned rearrange-
Errors in weighing when using a single-pan balance.

C D Fletcher

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