Simple slide-rule conversion between hydrogen ion concentration and pH values

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On a slide-rule that has both a logarithm (L) scale and a reciprocal (CI) scale it is possible with minimal arithmetic to convert in a single step between

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hydrogen ion concentration, $[H^+]$, and hydrogen ion activity exponent, pH. For the biological range, a reading on the L scale plus 7, as pH, is opposite a reading on the CI scale multiplied by 10, as $[H^+]$ in nanomoles per litre; in the figure the cursor connects a pH of 7.13 with the hydrogen ion concentration of 74 nmol/l. Similarly $L + 6 \equiv CI \times 100$, and $L + 8 \equiv CI \times 1$.

The same calculation is used for other ions, such as sodium, that may be expressed either as concentration or as activity exponent.

Fig Portion of slide rule showing numerical connexion between $[H^+]$ on CI scale, and decimal figures (mantissa) of pH on L scale.

Letter to the Editor

Technique for the NBT Test

We were interested to read the technique of Freeman and King (1972). We have been using a method which offers the advantages of being quicker, using materials readily available in a haematology laboratory, and allowing accurate cell identification (figure).

Into a plastic tube are put 2 drops of a saturated solution of NBT in 0.9% saline, 2 drops of 0.15M phosphate-buffered saline (pH 7.2), and 2 drops of whole blood to be tested. An expected 'high' control and an expected 'normal' control are treated in the same way. After gentle mixing the tubes are incubated at 37°C for 15 minutes and then at room temper-

Fig. Ease of distinction between granulocytes and other cells. One granulocyte contains formazan. The appearance is much clearer in the original coloured preparation.