

ACCURACY OF SEPARATION

The dense medium unit separates coal according to its density and so has no control or direct effect on the ash content. For dense media separators the coefficient characterising the intrinsic accuracy of the washing unit is no longer the "imperfection value" which might be expected but the "probable error". The relation between the probable error and the partition density is not simple as in jig washing. The partition density for a given size of particle is the specific gravity of the particle of this size whose velocity of fall in the medium is equal to four cm. per second. (Based on the depth of bath raked by the unit and the rate of travel across the bath, e.g. for Drewboy about ten seconds) The velocity of settling depends upon:-

- . particle size and shape,
- . particle density,
- . bath viscosity,
- . influence of hindered settling.

To compare units one may quote the probable error (E) or ( $E_{pm}$ ), which numerically is half the difference between the densities corresponding to the 75 per cent. and 25 per cent. ordinates as shown in the partition curve. Alternatively one may quote the "imperfection" (I) which is the ratio

$$\frac{\text{probable error}}{\text{partition density} - 1}$$

Various figures have been quoted by operators and manufacturers, for example:-

Drum separators	..	..	0.04 $E_{pm}$
			0.078 I
Cyclones	..	..	0.02 $E_{pm}$

SUMMARY

Heavy medium separation will become the major method of coal preparation. As fine coal is increasingly produced by mechanised mining and as coal is used in smaller particle sizes, cyclones will become of increasing importance. To date no suitable substitute for magnetite has been produced so that we should concentrate on using the best quality magnetite available for the machines and equipment which are best adapted for coal cleaning.