centrations a, and e, and the distances between successive bands is of the form

d(D - d) = K.ac where K is a constant. (3)

It seems legitimate to assume that D varies very slowly over the region occupied by a few consecutive bands. In these eirenmstances the variation of d with the product ac is exhibited graphically in fig. 6, the enryc being a parabola having a maximum ordinate at d = D/2, when  $ac = \frac{1/4D}{K}$ .

It will be seen from this curve that as the concentration product a.e decreases, the distance between successive bands will diminish or increase according as d < or = 1/2D. If the concentration product happens to take the value  $\frac{1/4\text{D}}{\text{K}}$  the bands will be equally spaced; otherwise they will be spaced at

diminishing or increasing distances according as the rate of variation of a.c with d is positive or negative.

For most cases of ontward diffusion of a strong solution against a weak solution d>1/2D so that the usual result is that the bands are formed at successively increasing distances apart. An illustration of this is seen in the inner part of fig. 1. The outer part of the same figure illustrates equal spacing of the bands, which is only rarely obtained. An example of the third case, where the bands become successively closer, is disensed below. (See page 24.)

In some of the experiments described above measurements of distances of diffusion were made over an extended period, the results being plotted in the form of curves, with times as abscissae and distances as ordinates. These enrives bring out clearly the way in which diffusion is prevented by approach of the molecular concentrations of the two reacting solutions toward the same point. They also show that in those cases where the diffusion proceeds rapidly at first there is a remarkably sudden drop in the rate of diffusion, and that this drop coincides with an almost uniform distance of diffusion. Some of these curves are reproduced in figs. 7 and 12. A comparison with figure 12 appears to indicate that the flat portions of the upper curves in figure 7 are due to a change in the viscosity of the gelatine.

A comparison of the enryes for silver and lead solutions against the same concentrations of chromate solution shows that the lead diffuses the more slowly. This is in agreement with the higher rate of diffusion of the silver solution in pure gelatine.

From this a consideration of the possibility that the speed of