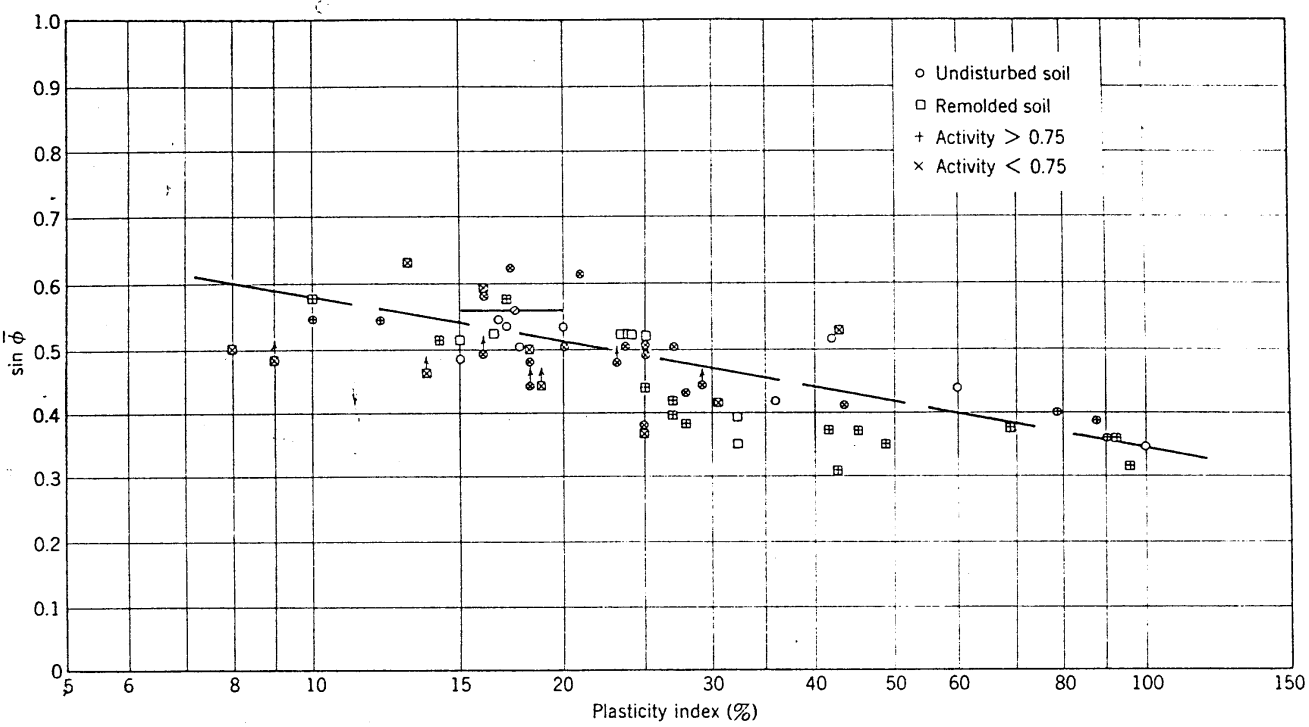

Fig. 21.4 Relationship between sin $\bar{\phi}$ and plasticity index for normally consolidated soils (From Kenney, 1959).

same line obtained from tests on normally consolidated specimens. For lower $\bar{p}_f$ the points fall above the relation from normally consolidated tests. Thus preconsolidation affects the effective stress-strength relation and tends to make the sample stronger at a given $\bar{p}_f$. This preconsolidation effect is difficult to see when results are plotted to the scale of Fig. 21.5*a*, hence the portion of this plot near the origin is magnified in the lower portion of the figure.

▶ Example 21.1

A specimen of Weald clay is consolidated to 100 lb/in.^{2}, and is then failed by decreasing $\bar{\sigma}_3$ while $\bar{\sigma}_1$ is held constant. Find q_f, $\bar{p}_f$, and w_f.

Solution. On part (*c*) of Fig. 21.1 draw the effective stress

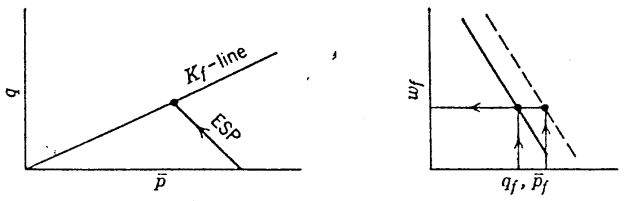

Fig. E21.1

path for this loading until it intersects the q_f–$\bar{p}_f$ relation (see Fig. E21.1). The point of intersection gives q_f and $\bar{p}_f$. Then go to Fig. 21.3, enter with *either* q_f or $\bar{p}_f$, and read w_f.

Answers. $q_f = 27$ lb/in.^{2}, $\bar{p}_f = 73$ lb/in.^{2}, $w_f = 19.2\%$. Note that w increased slightly during shear. ◀

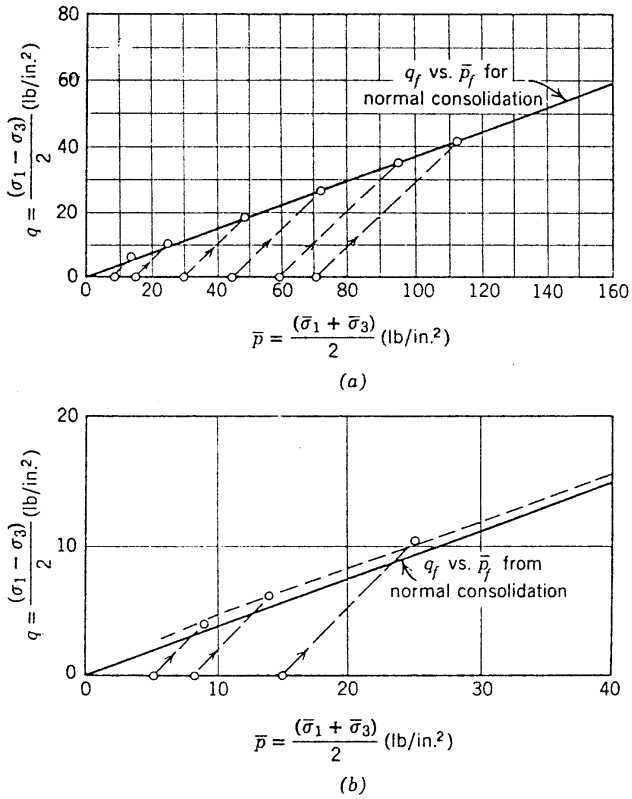

Fig. 21.5 Results of CD tests on overconsolidated Weald clay. $\bar{p}_m = 120$ lb/in.^{2}