$3.9 \times 10^{-5}$ (in/sec)/(psi/in) in the present units, so the value $8.6 \times 10^{-5}$ (in/sec)/(psi/in) would appear somewhat high. On the other hand, Jaeger and Cook cite a value $230 \times 10^{-5}$ (in/sec)/(psi/in) for "Berea sandstone" on page 197 of [10]. The textbook values of k span too wide a range to help determine the permeability of Wilkeson sandstone, but the assumed value falls within the range and is not unreasonable.

Figure 7 is a comparison between the theory and Olsen and Thomas's data. The ordinate represents h and the abscissa v, both coordinates being logarithmic. The curve was obtained from equation (28) by numerical integration for the given experimental conditions and assumed material properties, and for

$$\mu_w = 0.42 \quad . \tag{32}$$

Agreement between experiment and theory is seen to be excellent. The measured values of h do appear to become constant at low v in accord with (29), and in the opposite extreme they decrease inversely with v in accord with (30). The theory accurately describes the shape of the transition between the two asymptotes. The choice $\mu_w = 0.42$ befitting the data, moreover, falls in the midst of the plausible range (15). The comparison in Fig. 7 is highly encouraging, though positive confirmation of the theory must await an independent measurement of k.

Olsen and Thomas also subjected Wilkeson sandstone to a few pressures $P_o$ lower than 17,000 psi over a very limited range of feed rates. Figure 8 shows a sample of the results, for $d_o = 0.030$ inch and $\theta_o = 90°$ as before. The depth h is plotted as a function of $P_o$ for a feed rate v = 40 in/sec. The four experimental points were obtained by interpolating between data at nearby values of v, and the straight solid line follows from (28). The data describe an S-shaped curve, which tends toward the theory at high $P_o$. The fact that the first two points fall well below theory should come as no surprise, because equation (25) predicts a critical pressure $P_c = 7900$ psi when v = 40 in/sec. Notice that if h were assumed proportional to $(P_o - P_c)$ as shown by the dotted line, then the best choice for $P_c$ would be only 4000 psi. The $P_c$ of (25) should be interpreted as the pressure for which h falls short of theory by about half, rather than as an absolute cutoff.