



FIG. 2.5 Heat transfer from a metal surface to liquid helium, showing *nonboiling* curves, *nucleate-boiling* curves (for various pressures), and *film-boiling* curves (for various wire diameters D). (Adapted from correlation summaries by Richards et al. 1961 and Brentari et al. 1965 and from data summaries by Touloukian 1948, 1970. The 1 atm and 0.5 atm pressure nonboiling curves for vertical surfaces were determined from data by Karagounis 1956, the nucleate-boiling curves from a correlation by Kutateladze 1952, and the film-boiling curves from a correlation by Breen and Westwater 1962.) The predicted *critical heat flux* is shown by a circle at the top of the nucleate-boiling curves; the points of minimum film boiling at the bottom of the film-boiling curves are from correlations by Zuber and Tribus (1958).