

69. Reference to Fig. 34-24 may help in the visualization of why there appears to be a “circle of light” (consider revolving that picture about a vertical axis). The depth and the radius of that circle (which is from point  $a$  to point  $f$  in that figure) is related to the tangent of the angle of incidence. The diameter of the circle in question is given by  $d = 2h \tan \theta_c$ . For water  $n = 1.33$ , so Eq. 34-47 gives  $\sin \theta_c = 1/1.33$ , or  $\theta_c = 48.75^\circ$ . Thus,

$$d = 2h \tan \theta_c = 2(2.00 \text{ m})(\tan 48.75^\circ) = 4.56 \text{ m} .$$