ANGLE OF INCIDENCE AND AMPLITUDE RATIO OF P AND PP WAVES

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Apparent angles of incidence and amplitudes of P and PP waves of period 7 to 15 seconds were obtained from seismograms of the long period Columbia-Sprengnether instruments at the stations Manhattan (Kansas), Rolla (Missouri), Dubuque (Iowa) and Bloomington (Indiana). The calculated angle of incidence, by assuming Poisson's ratio equal to $\frac{1}{4}$, agrees with a velocity of 6.4 km/sec for these longitudinal waves near the surface of the earth. The amplitude ratios of reflected to incident waves at the points half the distance between epicenters and stations were calculated. Comparison of these ratios with theoretical results shows that the unsymmetrical radiation at foci and errors in measurements make difficult, but not impossible, the use of these ratios for studying the structure of the earth. Another possible way to use the relative amplitudes of P and PP waves for studying regions of doubtful structure is to examine if those regions give reflections not only at the surface of the earth but also at the bottom of a possible crustal layer. Atlantic reflections indicate that these longitudinal waves are not affected by any surface crustal layer under the Atlantic Ocean.