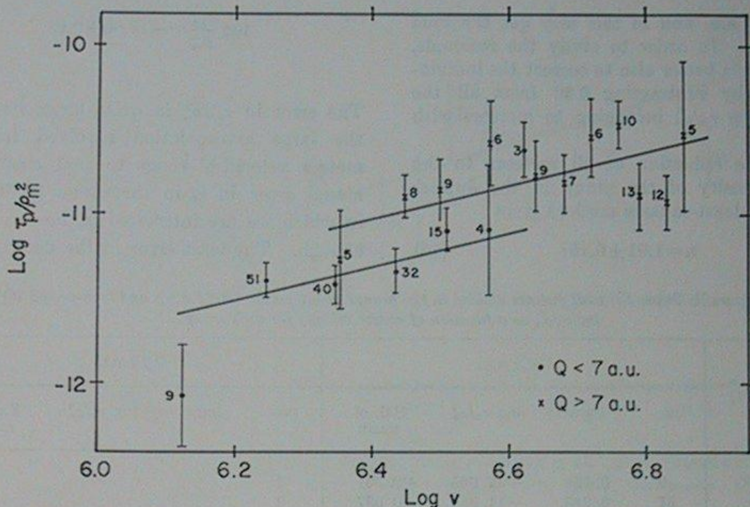

FIGURE 1.—Super-Schmidt meteors: log τ_p/ρ_m^2 as a function of meteor velocity for meteors in short-period ($Q<7$ a.u.) and long-period ($Q>7$ a.u.) orbits. The confidence marks represent standard deviations of the means. The number of meteors of each group is written near the points. (See table 2.)

log τ_p/ρ_m^2 for groups of increasing velocity. These values are given only as a reference for comparison with the final data. Before correcting the data, we computed two other least-squares solutions for estimating how much the chosen form of the weight w could affect the analysis. Two extreme cases have been considered. In the first, all the weights w have been put equal to 1; in the other, individual decelerations instead of individual meteors have been used. The results are both quite close to $n=1.5$, which confirms that the definition of the weight w affects neither the final results nor their reliability.

Let us now examine how to introduce a correction for the difference in density between meteors of the Jupiter family and long-period meteors. By dividing the sporadic meteors into two groups, one having the aphelion distance $Q<7$ a.u. and the other having $Q>7$ a.u., we get the results listed in table 2 and plotted in figure 1. These results show a mean difference of about 0.30 between the values of log τ_p/ρ_m^2 for the two groups. This means that the average density of the short-period meteors is about 1.4 times the density of long-period meteors. The reduction of the values of log τ_p/ρ_m^2 to the same velocity has been done with successive approximations, which lead to a value of n close to 1. If we compute two separate least-squares solutions for the two groups, we do not obtain reliable results. The reasons for this are very clear: (a) The range in velocity becomes too small for both groups; and (b) the statistical fluctuations of the data become important, because the amount of data is diminished. These fluctuations are clearly illustrated in figure 1, which shows that they are particularly important for the long-period meteors, which have a very large scatter. If we remove the extreme-velocity groups from the small-aphelion-distance meteors, we get a slope very close to $n=1$. Figure 1 also illustrates that the slope $n=1$ does not contradict the very irregular trend of the long-period meteors. We could correct the results by reducing the average values of velocity groups to the density of the meteors