TABLE 12b.—*Sporadic small-camera meteors: log τ_p/ρ_m^2 as a function of meteor velocity.*

Velocity, v (10^5 cms^{-1})	no.	log v	log τ_p/ρ_m^2	S.d. of mean	(log τ_p/ρ_m^2)$_{corr.}$	$\epsilon_\infty \pm$S.d.	w
10–20	11	6. 191	−12. 105	0. 226	−12. 105	1. 2±0. 2	4. 45
20–27	15	6. 354	−11. 310	0. 204	−11. 359	1. 6±0. 2	3. 61
27–40	10	6. 506	−11. 652	0. 206	−11. 708	1. 5±0. 3	3. 67
40–70	8	6. 734	−11. 305	0. 341	−11. 540	1. 4±0. 2	2. 64

(log τ_p/ρ_m^2)$_{corr.}$ is the mean value of log τ_p/ρ_m^2 after reduction of all data to density of short-period meteors.

Crosky and Soberman conclude that the luminous efficiency of chromium should be roughly equal to that of iron, so that the value of equation (38) should also be true for iron. They warn, however, that the probable extremes are −18 and −18.54. The second correction results from the possibility that the pellet is not completely ablated at the end of the detected luminosity. Fortunately, after a detailed analysis of the ablation experienced by the pellet, McCrosky and Soberman find that no significant correction is necessary for terminal mass in their case.

The last and most important correction is for the composition of meteoroids. There is observational evidence from the spectra of low-velocity meteors that practically all the light seen on a blue emulsion is caused by iron emission. Therefore the luminous efficiency of iron would give that of meteoric material if the iron content in meteoroids were known. Although the composition of iron and stony meteorites is well known, no truly reliable information is available on the composition of cometary meteoroids, which are by far the most common among meteors. McCrosky's extreme estimates are −20.10 and −18.80, which correspond to relative iron abundances of 1 percent and of 20 percent, with the warning that these should be lower limits because other elements will contribute, though little, to the luminosity. It is not unreasonable at the present stage to assume that the iron percentage in cometary meteors is equal to that of meteoritic stone, i.e., 15.4 percent (Öpik, 1958). In this case the result is

$$\log \tau_{op} = -18.91. \tag{40}$$

A detailed discussion for three asteroidal meteors, one iron and two stone, has been done by Cook, Jacchia, and McCrosky (1963). The density of these meteors being known, they were able to find the value of τ_{op}: log $\tau_{op}=-18.37$ for stone. They removed the discrepancy from the value of equation (40) by adopting for the three meteors $\gamma A=0.92$ instead of $\gamma A=0.6$. If we assume that the radiation of Al 0 is negligible for meteors, the value (37a) becomes −19.23, which agrees fairly well with the preceding results. In any case, the reliability of this value has to be considered much lower than that obtained with the Trailblazer. The value of equation (40) has also been accepted by Whipple (1963) in his recent paper on meteoroids and penetration.

By putting the value of equation (40) into equation (17a), we find the average density of the Super-Schmidt sporadic meteors with $Q<7$ a.u. The result,

$$\rho_m = 0.25 \text{ gcm}^{-3}, \tag{41}$$

is in good agreement with the value obtained theoretically by Whipple (1955) on the basis of his well-known cometary model. He found, in fact, that ρ_m must lie between 0.2 and 0.4 gcm^{-3}. If we reverse the procedure and assume $\rho_m=0.3\pm0.1$ gcm^{-3}, we get from equation (17a) log $\tau_{op}=-18.76$ with the extreme values −18.51 and −19.11.

Another experiment with a Trailblazer (McCrosky, 1963, private communication) has confirmed the previous result, thus enforcing the reliability of the method. It seems that the efficiency of chromium in producing light is larger than that of iron. In this case the value of equation (40) should be slightly