85. ON THE POSSIBLE COMMON ORIGIN OF MINOR PLANETS, COMETS, AND METEORS

S. GĄSKA

University of Toruń Observatory, Toruń, Poland

For the minor planets, comets, and meteors whose orbital elements are known values of the dispersions $\sigma_i(a)$ of the inclination i for intervals of the semimajor axis a have been calculated. Calculations on the minor planets show that, from the point of view of secular perturbations, $\sigma_i(a)$ is more stable than $\bar{i}(a)$, and we have therefore taken it as a fundamental relation for further considerations. It has been found that the relations $\sigma_i(a)$ are linear for minor planets, comets, and meteors with $a > 2$ AU. The lines are parallel, and for $a > 2$ AU the $\sigma_i(a)$ are proportional to a. Meteors have a second straight line for $a < 2$ AU, and in this case $\sigma_i(a)$ is proportional to $1/a$. It is concluded that minor planets, comets, and meteors could have a common origin.

The results are shown in Figure 1, where full dots denote minor planets, ☄ – comets, crosses – fireballs, open circles – photographic meteors, and triangles – radio meteors.
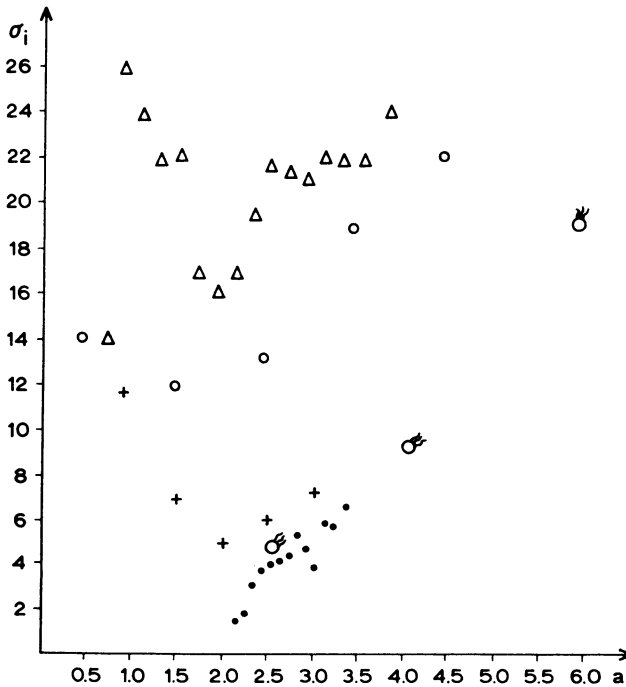

Fig. 1. The dispersions $\sigma_i(a)$ for various objects.