

Preface

In many ways, the small members of the Sun's family must be considered "weird". While the major planets continue in their sedate, nearly circular, orbits for millions of years, many smaller members of the Solar System loop across their paths in highly elongated tracks that change radically within the span of a human lifetime. Not only do their orbits change over short lapses of time, but it is not unusual for the objects themselves to undergo rapid and (in certain cases) extreme transformations. A bright comet may fade out whilst under observation. An asteroid may literally fly to pieces before our very eyes.

Thanks to the small dimensions of these bodies, as well as the obviously fragile nature of many of their number, these so-called minor members of the Solar System were for a long time not taken very seriously by the astronomical community. This situation has changed in recent decades, in part due to the recognition that objects of this type have likely played important roles in the history of life on Earth. In particular, the role played by an asteroid in the demise of the dinosaurs caught the imagination of the wider public. Actually, the end of the era of these giant creatures was probably more complex than the simple "death by asteroid" scenario, but there can be little doubt that the asteroid impact was an important contributor to the mass extinction that occurred at the end of the Cretaceous era. In short, whereas the great lizards would probably have become extinct with or without the assistance of a colliding asteroid, this catastrophic event undoubtedly hastened their demise, maybe by several tens of millions of years.

Less catastrophically, although no less importantly, comets and asteroids have increasingly been seen as sources of both the water and organic material acquired by the ancient Earth. In this way, these objects are now widely credited for preparing the way for terrestrial life itself. This too has caught the public imagination,

maybe not to the same degree as the role exercised by these bodies in catastrophic extinctions, but significantly nevertheless. Maybe the wider interest in the catastrophic role of comets and asteroids stems from the nervous realization that because these dramatic events have happened in the past, they will almost certainly happen again—and next time it might be humanity's turn to follow the dinosaurs into oblivion! That this fear is a serious one and not simply the theme of a science fiction horror story is demonstrated by the number of search programs dedicated to the discovery of potentially hazardous asteroids and comets, hopefully sufficiently in advance to ward off an oncoming catastrophe!

These new discoveries, as to the place of comets and asteroids in the grand scheme of things, have been largely responsible for the reawakening of interest in these bodies and, as interest grows, so does the impetus for further research uncovering more information as to their true nature. In its turn, this new knowledge has given us a better appreciation as to just how weird objects of this class can be. In the course of the pages which follow, we will look at some of the oddities exhibited by these objects. Contrary to what was once believed—that the line of demarcation between comets and asteroids is a sharp and well-defined one—we will see how these classes actually merge together. We will look at asteroids with tails and comets that look like mere specks of light. We will see asteroids break apart, comets simply vanish and even find hints of bodies that are comprised of both typical “cometary” and typical “asteroidal” material. In short, we will see just how interesting, frequently bizarre, and certainly not unimportant these so-called “minor” members of the Sun's family truly are!

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Weird Comets and Asteroids

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