CASE TEACHING NOTES
for
“The Zarkah Stone: The Park Forest Meteorite Case”
by
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INTRODUCTION / BACKGROUND
This case is appropriate for an introductory astronomy or planetary science course. It describes a rare event—a witnessed meteorite fall in a highly populated area. Part I of the case describes what happened the night meteorites fell on the Chicago suburb of Park Forest on March 26, 2003. Specifically, it tells the story of Jon Zarkah and his family, who find themselves in the possession of a five-pound chondrite. The story provides the context and motivation for students to learn about the characteristics and origin of meteorites. Part II continues the story by describing the aftermath, when scientists and collectors converged on Park Forest in search of meteorites. It illustrates the fervor of collecting these rocks and closes with the question, “What should be done with the Zarkah stone?”

The facts of the Park Forest meteorite fall are true but the characters in this case study are all fictitious. The case is based on newspaper and television reports, web sites, and personal communication. Portions of these sources have been extracted to enhance the authenticity of the case. However, since the event was real and the individual stones are still valuable to scientists and collectors, their identification is important. The title stone of this case study actually crashed into the Park Forest home of Noe and Paulette Garza, and is known today as the Garza Stone.

Objectives
After successfully completing the case, the successful student should be able to do the following:

• Define meteoroid, meteor, and meteorite.
• Define ablation and fusion crust and explain what causes the light phenomenon called a meteor.
• Define the major classifications of meteorites, their distinguishing physical and chemical characteristics, and their different origins.
• Trace the history of a chondrite from the solar nebula to its recovery as a meteorite on Earth.
• Explain why meteorites are valuable to the scientific community and to collectors.
• Evaluate the scientific, commercial, and personal value of the five-pound chondrite called the “Zarkah Stone” and decide its fate.

CLASSROOM MANAGEMENT
This case study is suitable for a 90-minute class period if students have already completed Part I and if they have some background about the formation of the solar system. Alternatively, students can work on Part I in one class period and Part II in the following class. Most introductory astronomy text books will not contain sufficient detail to answer the questions posed in Part I of the case study. Therefore, students will need time on their own or in groups to research these topics using library or Internet resources on meteorites. I refer my students to Kring’s e-book “Meteorites and Their Properties” (1998) and Pelisson and Pelisson’s SaharaNet illustrated “Chondrite Gallery” (2004).
The instructor can begin by assessing what the students have learned in Part I in a class discussion. I show three brief video clips of the Park Forest fireball lighting up the night sky (Brown, 2004) and ask them what they would have thought if they had witnessed such an event. This naturally leads into a dialogue about meteors, what they are, and where they come from. Since this case study is about a real event, I think this is a good time to show them the photographs of the real Garza stone and the damage it produced (i.e., see Elliott (n.d.) for a personal photo journal of his trip to Park Forest). If meteorite samples are available, this would be a great time to pass them around and let the student’s questions guide the discussion. This may take 30 minutes or longer, depending on interest.

Following this review, students read and complete Part II in small groups. The first activity asks that students tell the cosmic history of the Zarkah stone in a creative way. Thirty to forty-five minutes may be sufficient time to complete and share the results of this activity (it may be omitted entirely if time is short). The second activity asks them as a “family” to decide what they would do with the Zarkah stone. Ask family groups to report their decision and explain why. At the end of class the instructor can tell the students what actually happened to the large meteorite. Perhaps the class would want to arrange a field trip to look for their own meteorite samples in Park Forest or begin a fund-raising campaign to purchase the 2.337 kg Garza stone!

**Detailed Analysis**

Detailed case analysis is provided in a separate file that is password-protected. To access this information, go to the detailed case analysis. You will be prompted for a username and password. If you have not yet registered with us, you can see whether you are eligible for an account by reviewing our password policy and then apply online or write to answerkey@sciencecases.org.

**Supplemental PowerPoint Presentation**

The author has developed a PowerPoint presentation for use in class which is available on this site in a password protected, abbreviated version (the original also included a number of video files of the actual fireball that occurred the night of the meteorite fall in Park Forest, Illinois; those are available for downloading at http://aquarid.physics.uwo.ca/~pbrown/Videos/park_forest.htm). The presentation is intended for class-use only; website re-publication or distribution is strictly prohibited. If you have not yet registered with us, you can see whether you are eligible for an account by reviewing our password policy and then apply online or write to answerkey@sciencecases.org.

**References**


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