And what viewpoints! As any student of comets knows, the subject is replete with exciting anecdotes and a long list of characters. The author does an excellent job of putting the ancient events in a temporal context to which the reader can relate, while covering the multitude of events with which comets have been associated in the public mind in the last decade. These events range from the origin of Earth and the creation of its oceans to the death of the dinosaurs and observations of comets by the ancient Chinese and Greeks, the Norman invasion, the cosmologies of Isaac Newton and Edmund Halley, Comet Bennett and the 1973 Yom Kippur War, Comet Shoemaker–Levy 9 and its impact on Jupiter, Comet Hale–Bopp and the Heaven's Gate cult and last year's spate of Hollywood impact–disaster movies.

Levy has been in the thick of these events, having discovered a good number of comets himself and worked closely with others studying minor planets in our Solar System. He describes well what it is like to be a comet hunter (the average hunter spends 400 hours watching the skies before finding a comet) and he invites the readers to go outside and stargaze themselves, following a series of easy steps that he lays out.

The book reads like a series of essays loosely tied together by the overarching theme of cometary impacts on planetary bodies. Discussions include comets and the formation of the planets, a wonderful comparison of Venus, Earth and Mars (and why humans are a very lucky species) and the existence of extraterrestrial life and the need for Jupiters to protect inner, life-bearing planets from impacts. I particularly like his description of what it would be like to live near an impact site. (I remember thinking similar thoughts while being shown through Meteor Crater, Arizona, by Eugene Shoemaker, the father of the study of terrestrial impact features. At the bottom of this approximately 2 km wide and 300 m deep crater, we were invited to look up and around and view the consequences of a 10-megaton explosion; this was very sobering for any contemplation of nuclear war. It occurred to me at the time that, at a relative collision speed of ~50 km/s, the average being at the site would have only enough time to look up and think "Oh—.") Levy points out that while the impact was large, if any people had been living in what is now Flagstaff, Arizona (50 km away) at the time of the impact 50 000 years ago, they would have felt nothing more than strong ground tremors and heard a huge boom.

The one criticism I have of the book is that, while the individual chapters or essays read very well and are informative and thought-provoking, (à la the ruminations of Lewis Thomas on biology), the overall theme of impacts is returned to only in a somewhat haphazard way, making the book more experiential than tutorial I wish Levy had both broadened and refined his focus a bit more. It is clear that he has a lot to say and teach about astronomy as we currently know it, and has clearly used the long hours he has spent hunting comets to think hard about the subject.

I heartily recommend this book to anyone interested in learning about the study of comets and what is being done today to understand them and catalog their dangers to life on Earth. I then recommend that the reader pick up Fred Whipple's *The Mystery of Comets* (Smithsonian, 1980), another wonderful book by a master cometologist, to see how far we have come in the last 20 years of cometary study—and how far we still have to go.

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Basic Calculus: From Archimedes to Newton to its Role in Science

Alexander J. Hahn
Springer-Verlag, New York, 1998. 545 pp. $59.95 hc
ISBN 0-387-94606-3

Alexander J. Hahn's *Basic Calculus* is not a clone of the traditional calculus text. Its development is entirely historical, with many references to and quotes from sources that are, if not original, at least authoritative. Vast numbers of applications, in fields including astronomy, biology, engineering, economics and physics, permeate and surround a solid core of the elements of calculus. A truly modest sampling of topics includes: The potassium–argon clock, OPEC and the price of oil, the Springfield rifle, Hubble's law, the orbit of the Moon, sliding ice cubes, quantitative analysis of lenses, experimenting with *E. coli*, interior ballistics, free fall with air resistance, the internal combustion engine, the sliding chain, fermentation processes, supply and demand in a market and the rocket equation.

The seven chapters of part I ("From Archimedes to Newton") form the mathematical core. The first four of these chapters cover science and mathematics from Pythagoras to Kepler. Calculus first appears in chapters 5 ("The Calculus of Leibniz") and 6 ("The Calculus of Newton"). In chapter 7 ("The *Principia*"), the author takes us through Newton's geometric proof of equal areas in equal times. He then provides a commentary on Newton's proof that seems more resonant to a modern ear. Every serious physics student should dip into the *Principia* at least once. Part II ("Calculus and the Sciences") makes up about 60% of the book and, in its seven chapters, not only stresses applications to the sciences but also introduces new mathematics.

The author, a professor of mathematics at the University of Notre Dame, has used this book in a two-semester calculus sequence "for arts and letters honors students" and a one-semester course of "elementary applications of the calculus for regular arts and letters students and architecture majors." It seems to me that the book is very suitable for such courses. It is perhaps less suitable for a course in which the aim is to learn calculus as a tool and the desire is "to get on with it," without exploring historical byways. Several of its chapters would be appropriate for a course on the history of physics.

There is an abundance of worked examples and an average of about 60 problems at the end of each chapter, many of which could well be borrowed for assignment in an introductory physics course. The author's Web site, http://www.nd.edu/~hahn/ (the URL cited in the book seems to be incorrect) provides excellent support. Here, one can learn much about the mathematicians and physicists whose work the book describes. By judicious clicking one can generate planetary orbits, view a page from the *Conics* of Apollonius or the notebooks of Galileo, study a fascinating gallery of famous curves (from the Astroid to the Witch of Agnesi) or be connected to the US Census Bureau's home page. This is a well-written and interesting book, well suited to its stated purposes.

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Looking for Earths: The Race to Find New Solar Systems

Alan Boss
Wiley, New York, 1998. 256 pp. $27.95 hc
ISBN 0-471-18421-7

"There are three topics in your field that we try to keep up with," a *New York Times* reporter told an audience of astronomers recently: "the accelerating universe, dark matter, and, of course, planets of other stars." For astronomers too, extrasolar planets are one of the hottest topics of the 1990s. So it's not surprising that a half-dozen books on the subject have been pub-