Morse's book has many virtues: it is clear within reason, its physics is good and solid, and best of all it conveys a flavor of unity that must represent the author's own comprehension of thermal phenomena. The sense of unity is surprising in a book oriented to theory, since thermodynamics and statistical mechanics are basically quite different subjects whose marriage in a single course is a study in contrasts. But instructors and students who share a singlemindedness similar to Morse's, and a preference for theory, will find *Thermal Physics* the basis of a successful intermediate course. Even those who would wish for more attention to experiment and a more eclectic treatment could read and teach the book with profit. And perhaps in a future edition Morse could add data and references (at least) to make his book more versatile without sacrificing its unity.

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Wanted: Amateur Sleuths

Meteorites. Fritz Heide. Translated from the second German edition (Berlin, 1957) by Edward Anders and Eugene R. DuFresne. University of Chicago Press, Chicago, 1964. x + 144 pp. Illus. $6.50.

This little book is so simple, lively, and clear that many laymen can read and enjoy it. In his preface, the translator, Edward Anders, mentions that F. A. Paneth, in his very favorable review of the original book, said that he was opposed to a translation because "It can be assumed that most scientifically minded people, especially students at universities, know at least a little German." Anders, with the assistance of Eugene DeFresne, has now translated the book. Although it is debatable how much German scientifically minded people and students at universities know, it is not debatable that Fritz Heide's book is an excellent introduction to the subject of meteorites.

Meteorites are chunks of material that fall to the earth from outer space. The subject kindles interest easily. Heide's book, having only 131 small pages and being so easily readable, is the ideal first book on the subject. There is little danger that this book will extinguish anyone's interest. My biggest complaint is that the $6.50 price tag for the clothbound edition puts it out of the range of many high school students and even libraries. There is, however, a $1.95 paperback edition.

Although scientists have studied meteorites for 150 years, nonscientists have studied them much longer. Until recently, the number of laymen interested in meteorites greatly exceeded the number of professional meteoriticists. With the advent of the space age, meteorite research in the United States has accelerated tremendously, but the ratio of interested laymen to meteoriticists appears to be decreasing. In contrast with other branches of science, the ratio of laymen to scientists interested in meteorites is of vital importance to the subject itself, since the science of meteorites depends almost completely on laymen to collect samples. The amount of meteoritic material available for research is diminishing, although the need for such material is growing. The laboratory studies of these interesting objects, made with the modern tools of science, use increasing amounts of material, and most experimental findings stimulate more research. Since the number of falls from the sky cannot be increased, the collection efficiency must somehow be improved. The obvious way is to increase the number of collectors by interesting more laymen in meteorites. Heide, in his last paragraph, presents this ticklish situation in a somewhat different vein:

> In contrast to many other branches of natural science, the science of meteorites is in the enviable position of being able to invite large groups of the public with an interest in natural science to active participation, instead of merely passive reception of research findings. We have seen of what great importance is the entire complex of phenomena associated with the fall of a meteorite. Even limited and apparently insignificant observations by laymen can, if sufficiently numerous and made with sufficient accuracy, provide the basis for far-reaching and important conclusions. The author will be most pleased if he has succeeded in arousing interest and the desire to participate actively in our sciences in at least some of the readers of this little book.

Heide's book consists of three chapters. The first describes the phenomena associated with the fall of a meteorite—the displays of light and sound that accompany the deceleration in the atmosphere, the impact with the ground, and the craters. He also tells how one recognizes meteorites. Practically every page contains a photograph or a figure. The sections on the hazards connected with the fall and on historical facts are particularly entertaining. I did not know that a number of monks were hit by meteorites during the Middle Ages, nor that one killed a dog in Nakhla, Egypt, and another a colt in New Concord, Ohio. I also did not realize that Thomas Jefferson had put himself on record with the remark that it was easier to believe that a Yankee professor would lie than that stones would fall from heaven. The author also quotes other 18th-century scientists, including Lavoisier, on the absurdity of stones falling from heaven. His discussion of the first scientific book on meteorites, published in 1794, by the German physicist Chaladni, *On the Origin of the Iron Masses found by Pallus and others Similar to It, and on Some Natural Phenomena Related to Them,* stimulates my interest in the history of science.

The second chapter describes the meteorite matter itself—the sizes, surface features, and shapes and the chemical and mineral compositions. Here, too, photographs and figures on every page illuminate the text. Meteoriticists are astronomers, physicists, chemists, metallurgists, geologists, and biologists, none of whom often pays much attention to the specialist with a different background from his own. Heide is a professor of mineralogy and petrography at the University of Jena, but he emphasizes other studies more than mineralogy. This is remarkable and may be one reason why the book is so simple and clear.

The third chapter, on the ages and origin, is not so lively as the rest of the book. The attempt to cover uranium-helium ages, potassium-argon ages, and cosmic-ray exposure ages in four pages, which also contain two long tables, is not so successful as the rest of the book.

Because of the topic's relation to our space program, I would have expected a rash of American books on meteorites, but only two have appeared during the past 2 years—Brian Mason's *Meteorites* (Wiley, New York, 1962) and this translation. Both are needed. Heide's book stimulates the interest; Mason's book provides the vehicle by which people can easily go more deeply into the subject.

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