



Editorial

Jack D. Gaskill, Editor

Of Astronomy and *Tamiasciurus hudsonicus grahamensis*

I am writing this editorial to express my opinions about an issue that has received quite a bit of national and international attention during the past several years—the Mt. Graham red squirrel controversy. For those of you who may not have heard of this controversy, it involves a conflict between a number of environmentalist groups and a consortium of organizations involved in astronomy; included in the former camp are Earth First! and the Sierra Club, to name just two, while in the latter are the University of Arizona's Steward Observatory, the Smithsonian Institution, and the Vatican Observatory. Because I am in a field that has close ties with astronomy, and because my sympathies lie with the astronomers, I rather expect my motives to be questioned by the environmentalists. On the other hand, I have always considered myself to be an environmentalist, and I do not believe that having a genuine concern for environmental issues requires automatic opposition to any and all projects that involve conflicts between humans and their environment.

The controversy arises from a concern that the development of an astrophysical observatory in the Pinaleno Mountains of southeastern Arizona will have a detrimental impact on one of the inhabitants of the area, the Mt. Graham red squirrel (*Tamiasciurus hudsonicus grahamensis*). According to an environmental impact statement published in 1988 (Ref. 1), this squirrel is one of 25 subspecies of red squirrel (*Tamiasciurus hudsonicus*) found in North America, and one of three spruce-associated red squirrels found in the Arizona/New Mexico area. First reported in the 1800s, it was described as a unique new subspecies in 1894. After possible extirpation had been suggested by reports of low populations in the late 1950s and early 1960s, it was listed in a "threatened" category in 1976. The U.S. Fish and Wildlife Service finally placed the Mt. Graham red squirrel in an "endangered" category in 1987, and it is now estimated that there are somewhere between 100 and 200 of these animals in existence. It is interesting to note that this squirrel was a "legally huntable" animal until 1985.

Many of the environmentalists voice a fear that the development of the observatory may result in the extinction of the squirrel, and that the risks of this eventuality are simply too great to take a chance. Others present arguments that there are much better sites for the observatory, a mountain-top variation of the not-in-my-back-yard (NIMBY) attitude so familiar to all of us, and that space-borne telescopes have made ground-based astronomy obsolete. On the other hand, many of the observatory's supporters feel that the squirrel will adapt, as did the caribou to the Alaskan pipeline, and that the real threats to its survival will continue to be owls, disease, famine, inbreeding, etc. They also put forward arguments that the importance of the scientific discoveries that such an observatory would make possible outweighs any risks to the squirrel's survival.

It occurs to me that everything has a cost and that our main challenge when faced with a situation of this kind is either to determine what price we are willing to pay to achieve a particular goal, or what price we are willing to pay to prevent a particular occurrence. Suppose, just for the sake of argument, we knew without a doubt that the development of the observatory would doom the squirrel. Would the obvious scientific benefits of the observatory be worth the extinction of an entire subspecies? Would that be too high a price to pay? Or, would the obviation of the observatory's unique capabilities to explore the universe be too high a price to pay to keep a single subspecies from becoming extinct? Would the enormous costs of relocating the observatory or fabricating and orbiting space telescopes to replace it be worth a few hundred squirrels?

I won't attempt to answer those questions here, but I recently saw a "Nova" program on public television that caused me to philosophize about this problem. One part of that program, which was about dinosaurs, was devoted to a discussion of the theories that have been suggested as the cause of the extinction of the dinosaurs, and the statement was made that 99% of all the species that have existed on the earth at one time or another are now extinct. If that statement is true, and it seems to be well supported, any attempt to preserve a species eternally would appear to be doomed from

the start. And if that is true, to what lengths should we go to prolong the existence of a species for some unknown, but paleontologically insignificant, period of time? This question is not unrelated to those questions that come up in the field of medicine regarding the use of extraordinary measures, such as heart transplants, to prolong the life of a patient.

I would now like to leave you with a plot for a movie, the setting of which is here on earth millions and millions of years ago, that developed in my mind while I was writing this editorial. The astronomers have determined that an asteroid is on a collision course with the earth, and the environmentalists—eager to ensure the survival of the dinosaurs—have collaborated with the physicists and engineers to develop and launch a spacecraft armed with a nuclear device to rendezvous with the asteroid and destroy it. However, the anti-nuclear-in-space group gets wind of the project and is successful in obtaining a restraining order to halt it. Next, the optical engineers are called upon to design an orbiting directed-energy device to be used against the approaching asteroid, but the lobby opposed to SDI (Save the Dinosaurs, Inc.) successfully argues at a summary judgment hearing that such a device would be destabilizing and obtains a permanent injunction enjoining its use. There are a few more subplots involving various pro-choice, pro-life, and animal-rights groups, as well as SADD (Sad About Doomed Dinosaurs), etc., but the courts are so clogged that the asteroid impacts before the whole thing can be settled. You know the rest, except that the dinosaurs really aren't extinct. They just have a different name: we now call them politicians.

1. Final Environmental Impact Statement, Proposed Mt. Graham Astrophysical Area, Pinaleno Mountains, Graham Co., AZ, Coronado Nat'l. Forest, EIS #03-05-88-1 (Nov. 1988).

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