Readers applaud Robert Irion's article on the contributions of small telescopes to modern astronomy: "Small telescopes can (and do!) yield big science." Two letters say that preserving DNA from endangered species is not enough—we also need "conservation genetics research" and "improved ways of sampling and preserving DNA." Ryder agrees, but says that we should take first things first because "research is only possible if the samples are available" and that we will soon have the technical tools "to overcome many of the problems of degradation that have taken place" in DNA samples. Sir Arthur C. Clarke reminds us that his proposal for a "network of communications satellites in geosynchronous orbit...was not made in a work of science fiction," but rather in a technical paper.

Small Telescopes, Big Results

I am writing in praise of the News Focus article "Astronomers overcome 'aperture envy'" by Robert Irion (7 Jul., p. 32) in which an important point is made, courageously, in the face of "big" astronomy's new conventional wisdom favoring large telescopes: Small telescopes can (and do!) yield big science. Without the armada of well-equipped, small-aperture telescopes slowly sprouting up across the globe, the progress of discovery in astronomy and astrophysics would be severely stunted.

The value of Irion's piece can best be summarized by his quote of John Huchra's observation on the move toward larger instruments: "This trend hurts students the most." As an undergraduate at the University of Arizona, the only reason I was able to observe with a research-quality telescope at all was the availability of small instruments at Kitt Peak. (This was before the recent policy of "selling out" those telescopes to private consortia.) Graduate students usually don't get time on 8- to-10-meter telescopes. If they do, it is only by riding the coattails of their advisors' observing time and academic reputations.

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Although we enjoyed Irion's excellent article describing the many contributions of small telescopes, we were struck by the comments of National Optical Astronomy Observatories director Sidney Wolff, who stated that "forefront questions...require...more powerful instruments and multi-institutional collaborations." The article itself contradicts this view and describes a number of small telescopes and small collaborations that are making exciting contributions to "forefront" research. These include (i) measuring changes in the expansion rate of the universe; (ii) finding the optical counterparts to gamma-ray bursts; (iii) making precise observations of sun-like stars to understand solar influences on climate change; (iv) making the first direct detection of extrasolar planets, which led to the first determination of their physical properties; (v) understanding stellar interiors through asteroseismology; (vi) conducting the first deep all-sky survey in the near infra-red; and (vii) discovering near-Earth asteroids.

Thus, small telescopes are, in fact, making big contributions to science. It's clear to us that small telescopes still have a bright future.

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Shakespearian Views on Choosing Associates

In the item "Fat and happy" (Random Samples, 14 Jul., p. 241), James Watson is quoted on the merits of hiring thin people.

This forms an interesting contrast to the words William Shakespeare put into the mouth of Julius Caesar (*Julius Caesar*, Act 1, Sc. 2): "Let me have men about me that are fat, sleek-headed men, and such as sleep o' nights: yon Cassius has a lean and hungry look; he thinks too much: such men are dangerous."

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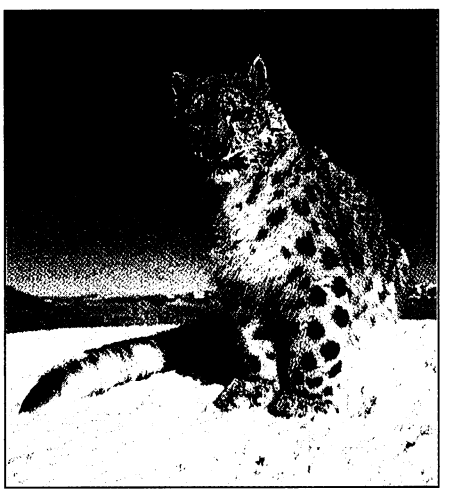
Preservation of DNA From Endangered Species

In their Policy Forum entitled "Ecology: DNA banks for endangered animal species" (14 Apr., p. 275), O. A. Ryder, A. McLaren, S. Brenner, Y.-P. Zhang, and K. Benirschke make it clear that now is the time for greater coordination and cooperation in the collection of DNA and other samples from endangered species (*1*). However, active conservation of these endangered species can also benefit from laboratory research to inform conservation management and policy (e.g., *2, 3, 4*). The examples Ryder *et al.* provide clearly show the importance of this research, but the Policy Forum does not address how the need for such research will be met.

Some portion of the collected DNA, tissues, and cell lines, equivalent to the human genome diversity cell line collection, plus an archive of tissues for physiological and DNA expression studies (*5*), must be made available to all interested researchers. "Soft" funding of collections means that changes in political climate, personnel, and funding availability are probable; to ensure stability, the collection must be funded at a base level with long-term funding to ensure continuity of expertise, support, and equitable availability at reasonable cost to conservation researchers.

Equally important, conservation biologists, managers, and policy-makers need access to technology and expertise in genetics research. Few researchers in conservation



The endangered snow leopard *Uncia uncia*.

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(and even fewer managers or conservation organizations) have access to the type of genomics technology or the expertise that serves the Human Genome Project. Genomics research for conservation biology, like collection and preservation of genetic samples, must be organized and brought up to the standards of scientific excellence demanded in human biomedical research.

The need for conservation genetics research is as urgent as the need for collection of genetic resources. These two parts of the conservation genetics equation cannot be treated independently. Formation of an endowed international collection and conservation genetics research organization would provide the necessary permanence and availability of a collection, and would also create the link between collection, research, and conservation that will make the