The degree of change in the grizzly bear population in Yellowstone National Park is said to be in dispute. An adviser to the Chief U.S. Forester points out that "[p]eople [in the United States] no longer view national forests solely as a warehouse of commodities to be brought to market." The implications of angiostatin's binding of ATP synthase on the surface of human endothelial cells are discussed. The climber's view of conserving cliff ecology is presented. And how 7-month-old infants learn the rules of language is debated.

Yellowstone Grizzly Population

The News Focus article "A species' fate, by the numbers" by Charles C. Mann and Mark L. Plummer (2 Apr., p. 36) is generally a good synopsis of the recent population viability (PVA) workshop in San Diego. They state, however, that the Yellowstone grizzly bear population has been increasing by 5% per year and that some experts say the bear could be removed from the endangered list. If only it were so. Unfortunately, both the numbers of bears and the rate of change in those numbers in the Yellowstone ecosystem are in dispute. Like Mark Twain's death, the "rumors of recovery" for the Yellowstone grizzlies may be highly exaggerated. Interested readers should look for an alternative analysis in a forthcoming article by Craig Pease and David Mattson in an upcoming issue of the journal *Ecology*. Most of the apparent increase has occurred since the fires of 1988 burned a good portion of the ecosystem. Bears may simply be more visible, or may be in new territory because their old feeding grounds are in the process of growing back after the fires. While I would like to think that PVA has made a tangible contribution to conservation efforts, I fear that the jury is still out on the real status of the first population to which these concepts were applied.

The grizzly population at Yellowstone National Park may not be increasing.

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Managing the National Forests

In an otherwise informative article by Charles C. Mann and Mark L. Plummer about the report of the Committee of Scientists relative to management of the U.S. National Forest System ("Call for 'sustainability' in forests sparks a fire," News Focus, 26 Mar., p. 1996), I am quoted as saying that "most folks have so much disposable income that they are looking at forests in terms of the positive outcomes of good stewardship like biodiversity, like tourism, like existence values...." While this may have been the most provocative and pithy part of my interview, the context is, unfortunately, lost.

Developing countries exploit their natural resource base, often in an unsustainable manner, in order to improve their standard of living. It is a strategy that rarely works. We in this nation have the highest standard of living the world has ever known, with so much disposable income available that we can afford to make investments in conservation. People no longer view national forests solely as a warehouse of commodities to be brought to market. Greater value is assigned to the positive outcomes of good stewardship like biodiversity, tourism, clean water, existence values, *and* an ecologically sustainable flow of goods and services.

To a certain extent, the whole debate over sustainability is academic. The U.S. Forest Service's commitment to sustainability is well established in tradition and law. Ecological sustainability frames the decision space from which we make economic and social choices. This is also a matter of common sense, as we simply cannot meet the needs of people without first securing the health of the land.

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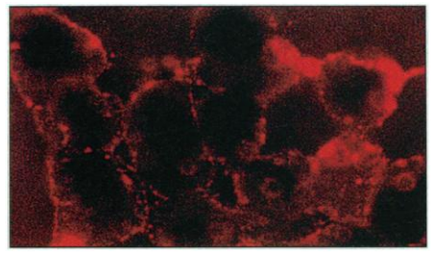
Angiostatin's Partners

I am writing to comment on Marcia Barinaga's article "A surprising partner for angiostatin" (News of the Week, 19 Mar., p. 1831). She describes a paper by Tammy Moser and her collaborators ("Angiostatin binds ATP synthase on the surface of human endothelial cells") (*1*) that indicates that angiostatin binds to the alpha and beta subunits of the mitochondrial adenosine triphosphate (ATP) synthase, presumably at the surface of endothelial cells. The authors further suggest that binding of angiostatin to the alpha and beta subunits of the ATP synthase may mediate its anti-angiogenic effects. This is indeed a remarkable finding because up until now we have believed that the usual place for F_0/F_1 ATP synthase is in the mitochondria, not in the plasma membrane of normal cells. Indeed, endothelial cells can grow in low-oxygen environments, such as tumors. It is well known that the extracellular pH of tumors is very acidic. Acidic extracellular pH is under most circumstances unfavorable for growth. Under these conditions, one would expect that tumors and endothelial cells might exhibit alternative pH regulatory mechanisms to allow proper cell survival and avoid intracellular acidosis. We have suggested that tumor cells accomplish this by means of plasmalemmal vacuolar–type proton adenosine triphosphatase ($V\text{-}H^+$-ATPase) (*2*). This enzyme normally resides in acidic organelles and works to maintain an acidic environment in endosomes and lysosomes. When located at the plasma membrane, this pump works to extrude acid. In highly invasive and metastatictumor cells, this proton pumping activity is exacerbated (*3*). We have preliminary evidence that microvascular endothelial cells involved in angiogenesis also exhibit plasmalemmal $V\text{-}H^+$ATPase at the leading edge (*4*). Because of the remarkable similarities in structure and subunit composition between $V\text{-}H^+$-ATPase and the F_0/F_1 ATP synthase, it is interesting that proton pumps usually believed to be located in intracellular organelles ($V\text{-}H^+$-ATPase in endosomes and



Fluorescently labeled antibodies (red) show ATP synthase on human endothelial cells.

CREDITS (TOP TO BOTTOM): T.L. MOSER *ET AL.*, *PNAS* **96**, 2811 (1999); JOE MCDONALD/VISUALS UNLIMITED

lysosomes and F_0/F_1-ATP synthase in mitochondria) are present in the plasma membrane of endothelial cells.

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Moser's paper identifies the alpha and beta subunits of F_1-ATP synthase on the surface of endothelial cells as binding to angiostatin, which is a potent anti-angiogenic factor. While this finding is indisputably noteworthy, it is perplexing that both the authors and the reporter imply that the enzyme is used to actually synthesize ATP. There are a couple of problems with this hypothesis. First, as described in both articles, it is assumed that the direction of proton flow is from intracellular to extracellular. This will simply not work. The proton motive force (PMF), which could theoretically be coupled to ATP synthesis, contains terms for both the concentration and electrochemical gradients for protons. The extracellular pH of most tumors is acidic and the intracellular pH relatively alkaline; the concentration gradient favors proton entry (*1*). Similarly, the negative membrane potential also favors proton entry. The orientation of the pump (head outside) is therefore contrary to the direction of proton flow in order for ATP to be synthesized in this fashion. Consequently, this enzyme either invokes a novel mechanism to couple proton movement to ATP synthesis, or the subunits are fulfilling some other function on the surface of endothelial cells.

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Climbing and Cliff Ecology

We are writing on behalf of the Access Fund (a climber's conservation and advocacy organization) to express concern regarding Kevin Krajick's article "Scientists—and climbers—discover cliff ecosystems" (News Focus, 12 Mar., p. 1623). We feel that Krajick presented only one side of the story with regard to climbing and cliff ecology. For example, Krajick points out that "the recognition of cliff life is so new, few parks have gotten around to making rules."

However, he does not mention that where "rules" such as access restrictions for climbing have been established to protect sensitive cliff-dwelling species, and where these are coupled with education and outreach, there is widespread compliance by climbers. For example, the Access Fund has details of ecologically based climbing restrictions at 94 locations, some of which have been in effect for more than two decades. Most are enforced on public lands, and all were established through the cooperation of climbers and land managers.

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Climbers at Pinnacles National Monument, California.

Furthermore, while there have been few published studies that have directly measured the impact of climbing on cliff systems (*1*), rock-climbers themselves, through their support of the Access Fund, have contributed financial support toward this field of research for the past 10 years. This includes the studies by Nuzzo (*2*) and four new partnership projects in 1999. In addition, the Access Fund is often acknowledged in other published work for providing advice and support. Unfortunately, these commitments to cooperation and to the advancement of our understanding of cliff systems are not well reflected in Krajick's article.

As scientists continue to explore cliff systems and as this information is passed along to land managers, the climbing community should be involved at each step so that appropriate education, resource protection, and recreational use can be established. We encourage interested parties to contact the Access Fund for information about climbing-related management plans or the possibility of small-dollar grants to support cliff-related research.

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Having climbed more than 35 years, and twice in Joshua Tree Park, I would like to point out that cliff-climbing routes are generally restricted to very narrow vertical paths because they follow faults and cracks that provide hand- and footholds. Generally, less than 1 percent of the rocks are actually trod on. This would not lead to climbers "taking out" an entire species.

Congressional acts that created parks emphasized use and conservation for future users, which has resulted in many more citizens who appreciate wilderness and who promote conservation. Trying to lock up the wilderness—or the top of a pinnacle at Joshua Tree—for ideological reasons is shortsighted, not to mention unfair to users.

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Do Infants Learn Grammar with Algebra or Statistics?

The report "Rule learning by seven-month-old infants" by G. F. Marcus *et al.* (1 Jan., p. 77) adds to a growing body of evidence concerning the remarkable learning abilities of infants. This evidence indicates that children acquire much more knowledge of language from experience than one might assume (*1*). However, the conclusion by Marcus *et al.* that the infants had learned rules rather than merely statistical regularities is unwarranted.

In the experiments in the report by Marcus *et al.*, infants were familiarized with sequences of syllables that conformed to patterns such as ABB or AAB (for example, "wo fe fe" versus "wo wo fe"). They were then tested on sequences containing different syllables that either matched these patterns or not. Infants preferred (*2*) novel sequences that violated the pattern to which they had been pre-exposed, and so were said to have learned the rule governing the sequences' "grammar." This conclusion rests on the fact that the test sequences contained novel syllables; thus, the infants could not have learned anything about their statistical properties. However, these "grammatical rules" created other statistical regularities. AAB, for example, indicated that a syllable would be followed by another instance of the same syllable and then a different syllable. Thus, in the pretraining phase, the infant was exposed to a statistical regularity governing sequences of perceptually similar and different events. The report's discussion focused on what the infants could learn about the particular syllables used in training, but there is no reason to deny these infants the capacity to learn these same-different contingencies.

There is also no reason to deny connectionist neural network models for this capacity. In our view, the goal of modeling is to understand children's behavior by endowing networks with the same capacities and experiences as children. The networks that Marcus *et al.* studied were not provided with either, so it is not unexpected that they be-