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Information for Contributors appears on pages 93–94 of the 5 January 1996 issue. Editorial correspondence, including requests for permission to reprint and reprint orders, should be sent to 1333 H Street, NW, Washington, DC 20005.

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LETTERS

JOSHUA GINSBERG

Life on Earth

The effect on endangered wild dogs (a group from Zimbabwe are shown above) to being studied in Tanzania's Serengeti National Park; the sturdy resistance of some bacteria's genes to challenges such as heat, dryness, and solar radiation; signs of cannibalism that may have been practiced among early humans in Spain; a controversy over evolution and science textbooks in Alabama's public schools; protein kinases at work outside the cell; and what astronomers do in their spare time—these are some of the concerns of this week's letter writers.

Alabama and Evolution

With respect to the Random Samples item "Alabama schools disclaim evolution" (24 Nov., p. 1305) concerning the actions of Alabama's governor in response to the State Board of Education's adoption of a biology text insert, we submit that an important aspect of the story was missed.

The Alabama State Board of Education, over the objections of the Eagle Forum and other religious fundamentalist groups, has adopted one of the most progressive kindergarten through 12th-grade science curricula in the country and the appropriate texts with which to implement it. The controversial insert was an ill-advised political attempt to placate such groups. Their actions are not representative of the people of Alabama. Requests have been made to have this offensive insert rescinded. Scientists throughout Alabama are working to achieve this end.

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Wild Dogs in the Serengeti

The Research News article "Dogfight erupts over animal studies in the Serengeti" by Virginia Morell (24 Nov., p. 1302) on the effect of intervention on Serengeti wild dogs is misleading and does not include important data on the effect of handling. Burrows *et al.* (*1*) in the *Proceedings of the Royal Society* (*PRS*) demonstrated that the survival of Serengeti wild dogs that experienced intervention was significantly less than that of unhandled animals. Comparison of the survival of wild dogs after antirabies vaccination ($N = 17$) with that of radio-collared dogs ($N = 12$) also demonstrated that vaccinated animals had a significantly shorter period of survival than radio-collared animals. Data and sample sizes were not "porous" or "sparse," but sufficient to warn of the negative impact of vaccination on this endangered canid.

The impact of anti-rabies vaccinations on the survival of wild dogs in the Masai Mara could have been examined by Kat *et al.* (*2*) in the November 1995 issue of *PRS*, but they did not present these highly relevant data. Using the limited published information on Mara wild dogs available so far, Burrows *et al.*, in the same issue of *PRS* (*3*), found that survival of wild dogs after intervention was also significantly reduced in the Mara. Morell states that, in *PRS*, "several groups attempt to take the hypothesis apart, reporting data that show no mortality differences between handled and unhandled dogs." None of these papers present mortality data for handled and unhandled wild dogs. Instead, all replies cited an analysis by Ginsberg *et al.* (*4*) that specifically excluded antirabies vaccination as a form of handling and assumed that all uncollared potential dispersers in five ecosystems died following their disappearance from a pack.

Morell states that "a 14-year study of the dwarf mongoose came to an end in 1992," which seems to imply that research was stopped due to the wild dog debate. The mongoose study was concluded in early 1991 before the death of Serengeti wild dog study packs. The Ngorongoro Conservation Authority has not permitted handling of lions in the Ngorongoro Crater since the late 1980s, thus an impression that such interventions have been denied due to the wild dog debate would be wrong. The Tanzanian National Parks Authority permits immobilization and radio-collaring when they consider such intervention justified.

However, the credibility of researchers in Tanzania has been severely affected by the demise of the wild dogs, due to scientists apparently not reporting the sudden demise of vaccinated packs in 1991.

If wildlife research is to play a role in conservation, then significant results from long-term research should be accurately reported, and all forms of intervention including vaccination must be carefully examined.

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References

1. R. Burrows *et al.*, *Proc. R. Soc. B* **256**, 281 (1994).
2. P. Kat *et al.*, *ibid.* **262**, 229 (1995).
3. R. Burrows *et al.*, *ibid.*, p. 235.
4. J. Ginsberg *et al.*, *Conserv. Biol.* **9**, 665 (1995).

Response: The paper by M. S. de Villiers *et al.*, "Handling-induced stress and mortalities in African wild dogs (*Lycaon pictus*)" does contain new data about the effects of handling on the species (*1*, p. 220).

In the current study, 79 immobilizations of 40 captive wild dogs over the last two years did not result in any mortalities. Captive wild dogs which were vaccinated by darting (n = 2) or vaccinated by hand (n = 21) against rabies were all alive a year later.

Regarding the effects of the deaths of the Serengeti wild dogs on other wildlife research: Scott Creel studied the dwarf mongooses in the Serengeti from 1987 until 15 June 1991, just before the first reports about the wild dogs came in. In 1992 and 1993 two other researchers attempted to renew Creel's project, but were turned down by Tanzanian park authorities in part because of the handling issue, says Creel. Similarly, researchers with Craig Packer's Serengeti Lion Project last collected blood samples from the Ngorongoro Crater lions from 11 to 22 March 1991, a few months before the demise of the wild dogs. Since then, all requests to resume this sampling have been denied.

The majority of researchers interviewed for this article concluded that given the paucity of the data, it is impossible to determine what caused the deaths of the Serengeti wild dogs. They also urge a closer look at the issue of handling wild animals and, as reported, are doing just that.

Virginia Morell

References

1. M. S. de Villiers *et al.*, *Proc. R. Soc. B* **262**, 215 (1995).

Resistance to Mutagenesis

In the Perspective "Resistance to radiation" (24 Nov., p. 1318), Michael J. Daly and Kenneth W. Minton speculate about the resistance to ionizing radiation of the bacterium *Deinococcus radiodurans*. They mention that this high resistance could be an evolutionary response to routine dehydration.

The very wide range within the plant kingdom and between plants and animals in sensitivity to ionizing radiation was the subject of the life work of Arnold Sparrow (1914–1976) at Brookhaven National Laboratory. Sparrow elaborated the details of the sensitivity and showed how and why organisms with many small chromosomes were more resistant than those with few large chromosomes. In his latter years, Sparrow addressed microorganisms in particular with great effectiveness (*1*).

I addressed the question of radiation resistance as it is related to evolutionary history and ecological role, and came to a similar conclusion to that expressed by Daly and Minton, but I discussed a broader array of potentially mutagenic factors, such as extremes of temperature and moisture (*2*). The topic raised by Daly and Minton is fascinating and has broad implications that have been only superficially examined.