Rabies in African Wild Dogs of Tanzania

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LETTER TO THE EDITOR . . .

Rabies in African Wild Dogs of Tanzania

I read with interest Gascoyne et al. (1993a) reporting the confirmation of rabies in one African wild dog (*Lycaon pictus*) in the Serengeti region of Tanzania and anti-rabies vaccination and monitoring program carried out by the Frankfurt Zoological Society (FZS), Serengeti Wild Dog Long-Term Monitoring Project.

Between October 1989 and September 1991 I conducted behavioral research on wild dogs in the Serengeti National Park (SNP) and the adjacent Ngorongoro Conservation Area (NCA). As I was present during the FZS vaccination program described by Gascoyne et al. (1993a), I wish to point out some errors, anomalies and omissions in this paper. My role during the vaccination program was to facilitate the identification of individual dogs prior to darting, I was not involved in the design of the vaccination program.

The scientific debate concerning the extinction of the entire Serengeti study population (see Heinsohn, 1992; Burrows, 1992; Creel, 1992; Macdonald, 1992) within 10 mo of the vaccinations surprisingly is not mentioned by Gascoyne et al. (1993a).

In the introduction demographic data is wrongly quoted from two of the references given (Malcolm, 1979; Fanshawe et al., 1991). In the Materials and Methods, the date and duration of the anti-rabies vaccination trials conducted at Frankfurt Zoological Gardens is not stated. The efficacy of the dart-vaccination technique to be used in Serengeti was not tested on the four captive animals; although these seroconverted they, unlike some of the free living wild dogs, were sero-negative prior to vaccination. No information is provided on any changes over time in the anti-rabies titers of the four captive vaccinated wild dogs.

To justify the claim that 1 ml of the vaccine was administered to each dog dart-vaccinated, data is required on the number of darts delivering a full dose to the target individual. Further it is stated that the dart-vaccinated dogs all were darted into the shoulder muscle mass. In fact individuals were hit in a variety of sites including the foot. The total number of dogs vaccinated ($n = 34$) is surprisingly not reported.

Contrary to the impression given by Gascoyne et al. (1993a) that some pups deliberately were not vaccinated because they were <12-wk-old, I offer the following. At vaccination the Ndoha Pack contained four pups >12 weeks old which could have been vaccinated. A second opportunity to vaccinate the same pups was missed when, four months later, the pack was next located. The pack was never again re-located and so neither litter of Ndoha pups was vaccinated. When the Salei adults and older pups were vaccinated the five pups comprising the younger of the two litters present already were >20 weeks old.

The statement that neither pack was greatly disturbed during the vaccination procedure is very subjective as many individuals ($n = 17$, $n = 12$ respectively), were vaccinated per day. This process, which also included anesthetizing two dogs in each pack for radio-collaring or blood sampling, caused continual disturbance for approximately 5 hr for the Salei Pack and 7 hr for the Ndoha Pack.

Gascoyne et al. (1993a) stated, "No lameness, injection site reaction, or systemic disease was seen in any individual during a 5-mo follow-up period after vaccination." This is inaccurate as 50% of the adults (the Ndoha) were not seen again until next located and visited on the ground, 4-mo post-vaccination. By that time the alpha male was missing, three adult males had emigrated, and five new pups were present.

The only data on confirmed mortality

is incorrect. By 8-mo post-vaccination three (not one as stated) adult vaccinated dogs had disappeared (Burrows, 1993) and it was by 10 mo (not 8 mo) post-vaccination that the death of four dogs referred to by Gascoyne et al. (1993a) was confirmed. The latter all were radio-collared, four of six such tagged individuals from five packs; the two vaccinated packs had, by 5 mo post-vaccination, formed five packs. Unless the authors assume that radio-collared dogs suffered higher mortality than non-collared individuals, then it is likely a similar proportion of non-collared vaccinated dogs also was dead.

Gascoyne et al. (1993a) do not mention the vaccination against rabies since 1987 of wild dogs that are part of the same Serengeti breeding population in the adjacent Masai Mara area in Kenya (Macdonald, 1992). There is no discussion of the fact that some of these vaccinated individuals were known to have died with rabies confirmed by laboratory examination 12-mo prior to the vaccination program in the Serengeti or that some Mara dogs died from rabies up to 12 mo post-vaccination. It is therefore surprising that the Seregenti follow-up period was for 5 mo but no rationale for this is provided (Heinsohn, 1992). Further, despite rabies being confirmed in a Mara pack in 1989 and considered to be a sufficient threat to the Serengeti study population (Lelo, 1990) to warrant vaccination, no pre-vaccination tests to determine rabies antibody prevalence were conducted on all the samples available *prior* to the start of vaccinations (Lelo, 1990).

Gascoyne et al. (1993b), using the same data presented in their present paper report five of 12 individuals with pre-vaccination levels of serum rabies neutralizing antibodies (SRNA) of >0.5 IU/ml. Gascoyne et al. (1993a) now claim only three of 12 samples with this titer level (also see Macdonald, 1992). No explanation is provided for the change in the interpretation. Moreover, the original serologic analysis was conducted on a minimum of 13 serum samples. Two of these samples were collected on the same day from one individual (hence $n = 12$), but had differing titers, one positive (>0.5 IU/ml) and one negative. Only the negative sample is included in both (Gascoyne et al., 1993a, b). It is incorrect to state that three individuals with a pre-vaccination titer level >0.5 IU/ml were alive 15 mo after blood sampling; one had died or disappeared by 8 mo.

Gascoyne et al. (1993a) state that most animals with high serum neutralizing antibody titers usually resist subsequent challenge infection. This correlation is, however, only valid in animals vaccinated prior to challenge (Wiktor, 1978); this was not the case for some of the Serengeti wild dog population.

It is claimed that the vaccination program described was based on guidelines in Hall and Harwood (1990). However, Gascoyne et al. (1993a) appear to have overlooked many of these in making their decision to vaccinate and in the design and execution of their program. They overlooked the necessity to establish that a single dart-vaccination with an inactivated vaccine was an effective, viable, and prudent method of providing an acceptable level of protection against rabies challenge in a free living population already exposed to the disease. Hall and Harwood (1990) warn that "Once the path of vaccination has been decided upon, each new generation must be vaccinated because it will be susceptible to the disease. If vaccination is discontinued, the population may be more vulnerable to the disease than it was before." The failure of Gascoyne et al. (1993a) to vaccinate two generations of Ndoha pups, and three adult immigrants in another of the study packs must call into question such a commitment and the design of the program.

Gascoyne et al. (1993a) report on a partial vaccination of the known Serengeti wild dog adult population and 55% of the pups. The effectiveness of the vaccine used for this species is unknown and the efficacy of dart-vaccination unproven by trials. The

post-vaccination monitoring of the study packs proved inadequate to enable collection of post-mortem tissue samples from any vaccinated (n = 34) or unvaccinated (n = 12) individuals even though six dogs were radio-collared. The opportunity to acquire vital data on the efficacy of a unique vaccination program involving an endangered species was lost.

It is to be hoped that lessons will be learned from the selective extinction of the vaccinated study packs in the Serengeti ecosystem in 1991 and that any future attempt to vaccinate wildlife will be undertaken as part of a well conceived, carefully executed, and effectively monitored program, the results of which are fully and accurately reported.

LITERATURE CITED

BURROWS, R. 1992. Rabies in wild dogs. Nature 359: 277.

———. 1993. Observations on the behavior, ecology and conservation status of African wild dogs in SNP. *In* Serengeti Wildlife Research Centre scientific report 1990–92, S. Huish and K. L. I. Campbell (eds.). Serengeti Wildlife Research Centre, Arusha, Tanzania, pp. 53–59.

CREEL, S. 1992. Causes of wild dog deaths. Nature 360: 633.

FANSHAWE, J. H., L. H. FRAME, AND J. R. GINSBERG. 1991. The wild dog—Africa's vanishing carnivore. Oryx 25: 137–146.

GASCOYNE, S. C., M. K. LAURENSON, S. LELO, AND M. BORNER. 1993a. Rabies in African wild dogs (*Lycaon pictus*) in the Serengeti region, Tanzania. Journal of Wildlife Diseases 29: 396–402.

———, ———, AND M. BORNER. 1993b. Rabies in African wild dogs *Lycaon pictus*. *In* Proceedings of the international conference on epidemiology, control and prevention of rabies in eastern and southern Africa, Lusaka, Zambia, A. King (ed.). Merieux, Lyon, France, pp. 133–140.

HALL, A., AND J. HARWOOD. 1990. The Intervet guidelines to vaccinating wildlife. National Environment Research Council, Sea Mammal Research Unit, Cambridge, England, 25 pp.

HEINSOHN, R. 1992. When conservation goes to the dogs. Trends in Ecology and Evolution 7: 214–215.

LELO, S. 1990. Conservation status of the wild dog (*Lycaon pictus*) in the Serengeti ecosystem. *In* Serengeti Wildlife Research Centre biennial report 1988–89, S. A. Huish and K. L. I. Campbell (eds.). Serengeti Wildlife Research Centre, Arusha, Tanzania, pp. 27–30.

MALCOLM, J. R. 1979. Social organization and communal rearing in African wild dogs. Ph.D. thesis, Harvard University, Cambridge, Massachusetts, 215 pp.

MACDONALD, D. W. 1992. Causes of wild dog deaths. Nature 360: 633–634.

WIKTOR, T. J. 1978. Cell-mediated immunity and post-exposure protection from rabies by inactivated vaccines of tissue culture origin. Developments in Biological Standards 40: 255–264.

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