Observations on Why Mongrels May Make Effective Livestock Protecting Dogs

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Introduction

Black and Green (1985) and Black (1981) have done an extensive survey and interpretation of the environmental and training procedures that the Navajo use to produce livestock protecting dogs. They have given the best explanation to date of "the system" used to produce livestock protecting dogs not ony by the Navajo but, with minor regional modifications, the method used by Eurasians as well. Anyone expecting to raise a successful protecting dog of any type should follow this recipe.

There is, however, a danger for producers in too liberal a translation of the Black papers. Very simply, these papers might imply that a successful protecting dog is the product solely of environmental conditioning and that any type of dog will do, provided it is raised and trained properly. No evidence is produced in the papers that this is so, nor is evidence advanced as to whether mongrels used by the Navajos have a success rate higher or lower than the Eurasian dogs specifically selected for the task of protecting livestock. Black (1981) argued that mongrel dogs would be cheaper, but we remain skeptical since the cumulative medical and maintenance costs quickly dwarf other expenses (excepting exorbitant purchase fees). The percent of dogs culled for misbehaving increases substantially the cost to both the producer and to the industry.

Studies of the effectiveness of livestock protecting dogs in the past several years have begun to show that these dogs are an effective deterrent to sheep predation by coyotes and domestic dogs (Coppinger et al. 1983). Our field studies have focused on Turkey, Yugoslavia, Italy, and Portugal (all these regions have developed sheep protecting varieties of dogs). However, recent studies in Mexico by us and studies of Navajo hybrid dogs by Black and Green published in the January '85 issue of this *Journal* have shown that mongrel dogs may indeed be useful in protecting livestock.

Black and Green's (1985) and Black's (1981) argument is that small mongrel dogs are effective and that mongrels would be cheaper, more readily obtained and maintained, of lower liability, and more easily disposed of if their behavior proved unacceptable. Black and Green's underlying assumptions are these: that intraspecific (dog-to-dog) social bonding patterns are the same for all breeds and thus for cross-breeds as well, that these relationships are transferable to livestock, and that behavior differences in dogs are matters of degree and not of kind (Black and Green 1985). We disagree with these assumptions.

Nevertheless we believe that Black and Green are correct in their assessment of the efficacy of mongrels for livestock protection. For reasons we wish to make clear in the rest of this essay, mongrel dogs would likely be better livestock protection dogs than most pure breeds, except for Eurasian dogs bred specifically to protect sheep.

Livestock protecting dogs are not new to the Southwest, Central and South America. Darwin (1845:150ff), for example, commented on the behavior and training of livestock protecting dogs that he saw during his visit to the province of Banda Oriental in 1833. He reported the castration of sheepdog puppies and of rearing the pups restricted from human contacts, keeping them with sheep and even suckling them on sheep, all of which is still practiced in Mexico. Missionaries imported from Europe special dogs to use with mission flocks to train Indians in proper husbandry. Baur (1982:56) quoted J.H. Lyman in the 1860's as saying: "I very much doubt if there are shepherd dogs in any part of the world, except Spain, equal to those of New Mexico in value." In the literature of the Southwest, frequent passages related how the dogs were raised and how good they were, even including a painting by Harmer which appeared in the magazine *Land of Sunshine* (Vol. 9, June 1898) of a classic large dog of the Spanish mastiff type guarding against buzzards the arrow-filled carcass of his master.

Precisely what happened to the Castillian mastiff in southwestern North America can only be a matter for speculation, but three possibilities seem most likely. First, the dogs may have been killed by natives and soldiers while stealing sheep. Baur (1982) relates how a soldier in Colonel Stephen Kearny's regiment stole a sheep and was faced with a livestock protecting dog. In that case the dog apparently survived, but in many cases the protecting dog must have been killed. Second, the Southwest was full of mongrel dogs in Santa Fe, Tucson, and Los Angeles, where one could not sleep nights for the noise. Orders finally went out such as Kearny's, "Shoot all the dogs." Third, the people of English ancestry who took over the sheep industry in the Southwest were most likely confused about the role of livestock protecting dogs. English sheepdogs are collies—conducting dogs—and there has been a pervasive misconception among Anglos that sheep dogs herd as well as guard or protect.

This misunderstanding of the distinction between conducting and protecting is reiterated by Kupper (1945); after giving a short lesson on how to raise and train a livestock protecting dog, which is very reminiscent of Darwin's 19th century description, she states, "If the master wanted to increase his usefulness and had the patience to train him, the dog was taught the art of herding." The Spanish or Mediterraneans are seldom confused on his point. Baur (1982), however, quoted the frustration of the Anglos at the big "lazy" Mexican dogs which didn't conduct, often causing them to get rid of the livestock protecting dogs.

Add these events together and it is not hard to see the demise or more probably the mongrelization of the Castillian mastiff. For whatever reason, the pure protecting breeds did not persist. Yet the technique for employing such dogs and the mythology for their training lives on in Mexico and South America and with Native American shepherds who learned from the Spanish. The Navajos, who probably had experience with how Castillian Mastiffs (or Mastiff × mongrel hybrids) could protect, though not conduct, sheep, have apparently made good use of mongrel dogs ever since.

Vines (1981) and Holmes (1966) suggested that conducting or herding is inhibited predatory behavior. Conducting or herding breeds are poor at livestock protecting because they have retained too much of the ancestral predatory patterns to establish interspecific social bonds with sheep. The same is true of other breeds such as retrievers, pointers, or bloodhounds, which inherit an incom-

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plete predatory behavior sequence with the killing components attenuated.

In contrast, livestock protecting dogs relate to sheep as though they were conspecifics and live with and protect sheep 24 hours a day without eyeing or stalking them as if they were prey. A second condition is the deactivation or disruption of species-specific recognition so that dogs can establish interspecific social bonds with sheep, goats, or cattle. Herders using European livestock protecting dogs or Navajo mongrels must select rigorously against the canid predatory sequence. Both selection within breeds and hybridization between breeds may supply the variation for protecting dog selection.

Inactivating Predatory Behavior by Selected Retardation of Ontogeny

Differences in organization of breed behavior as well as in onset and frequency of expression of single motor patterns can be most parsimoniously explained by positing ontogenetic selection—i.e., selection for mutations in genes that regulate rate of development in both morphology and behavior (see Fox 1978; Coppinger and Smith 1983:286). The wild canid predatory sequence that is expressed as an adult species-specific behavior is not evident in wolf neonates who first suckle for sustenance and later beg for parentally regurgitated food. Only later in ontogeny do all the motor components of species-specific predation become activated in young wolves. Furthermore, when these behaviors do begin to be expressed during ontogeny they remain, during the youthful phase, separable units of behavior capable of being mixed with various other motor patterns from diverse functional contexts (Fentress 1983). Such combinations and recombinations of recognizable species-specific motor patterns into contextually unpredictable, seemingly non-functional, strings are commonly called "play" (Fagen 1981) and are characteristic of the youthful phase in all canids. For example, D.K. Belyaev (1979) reported selecting for tameness during a period of about two decades to produce a domesticated "adult" silver fox (*Vulpes fulvus* Desm.) with floppy ears, curled up tail and dog-like barks and with puppyish care-soliciting behavior, licking and fawning on humans. In very neotenic canids, such as livestock protecting dogs, these behaviors are characteristic of the adult phase as well (Coppinger and Coppinger 1982).

Disrupting Predatory Behavior by Hybridization

Hybridization (or mongrelization) may result in radical genetic recombination. Hybridization affecting evolutionary change was called "crossing between individuals belonging to separate populations which have different adaptive norms" (Stebbins 1959). Hybridization tends to be genetically disruptive to what was, in a parent, an innate adaptive behavioral sequence (Fox 1978). Hybridization of dogs adapted for different kinds of specialized work can produce a mongrel in which a parental sequence of behavior is often rearranged, truncated, or deactivated with few of the original components inherited intact. In other words, producing a mongrel or hybrid is likely to accomplish the disruption of species (breed)-specific behavior as surely, and much more swiftly, than deactivating adult wild-type species-specific behavior sequences through ontogenetic selection for permanently youthful non-predatory behavior. Indeed selection for tameness in the wild progenitor of dogs and other domestic species for the last 10,000–15,000 years may have been facilitated by hybridization and the resulting disruption of eco-specific behaviors. Thus mongrel dogs not displaying the stereotyped ancestral behavior patterns might be acceptable mimics of the Eurasian guardians which have been purposefully selected for the task of protecting livestock.

References

Baur, J.E. 1982. (Second Printing) Dogs on the Frontier. Denlinger's, Fairfax, Va.

Belyaev, D.K. 1979. Destabilizing selection as a factor in domestication. J. Heredity 70:301-308.

Black, H.L. 1981. Navajo sheep and goat guarding dogs. Rangelands 3:235-237.

Black, H.L., and J.S. Green. 1985. Navajo use of mixed-breed dogs for management of predators. J. Range Manage. 38:11-15.

Coppinger, L., and R. Coppinger. 1982. Dogs in sheep's clothing guard flocks. Smithsonian. April:64-73.

Coppinger, R., J. Lorenz, J. Glendinning, and P. Pinardi, 1983. Attentiveness of guarding dogs for reducing predation on domestic sheep. J. Range Mange. 36:275-279.

Coppinger R., and C. Smith. 1983. The domestication of evolution. Environmental Conservation 10:283-292.

Darwin, C. 1845. (2nd Ed.) Journal of researches. John Murray, London.

Fagen, R.M. 1981. Animal play behavior. Oxford U. Press, N.Y.

Fentress, J.C. 1983. A view of ontogeny. *In:* J.F. Eisenberg and D.G. Kleiman, eds. Advances in the Study of Mammalian Behavior. Special Publ. No. 7, Amer. Soc. Mammalogists:24-64.

Fox, M.W. 1978. The dog: its domestication and behavior. Chapter VI "Effects of domestication on prey-catching and killing in domestic and wild canids and F_2 hybrids." Garland STPM Press, N.Y. & London.

Holmes, J. 1966. The Farmer's Dog. Popular Dogs, London.

Kupper, W. 1945. The Golden Hoof. Alfred P. Knopf, N.Y.

Stebbins, G.L. 1959. The role of hybridization in evolution. Proceedings of the American Philosophical Society 103:231-251.

Vines, G. 1981. Wolves in dogs' clothing. New Scientist 10:648-652.