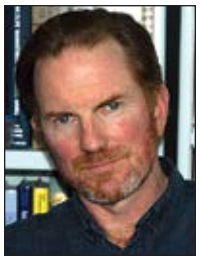
NATURAL HISTORY AND WILDLIFE SCIENCE



JOHN F. ORGAN
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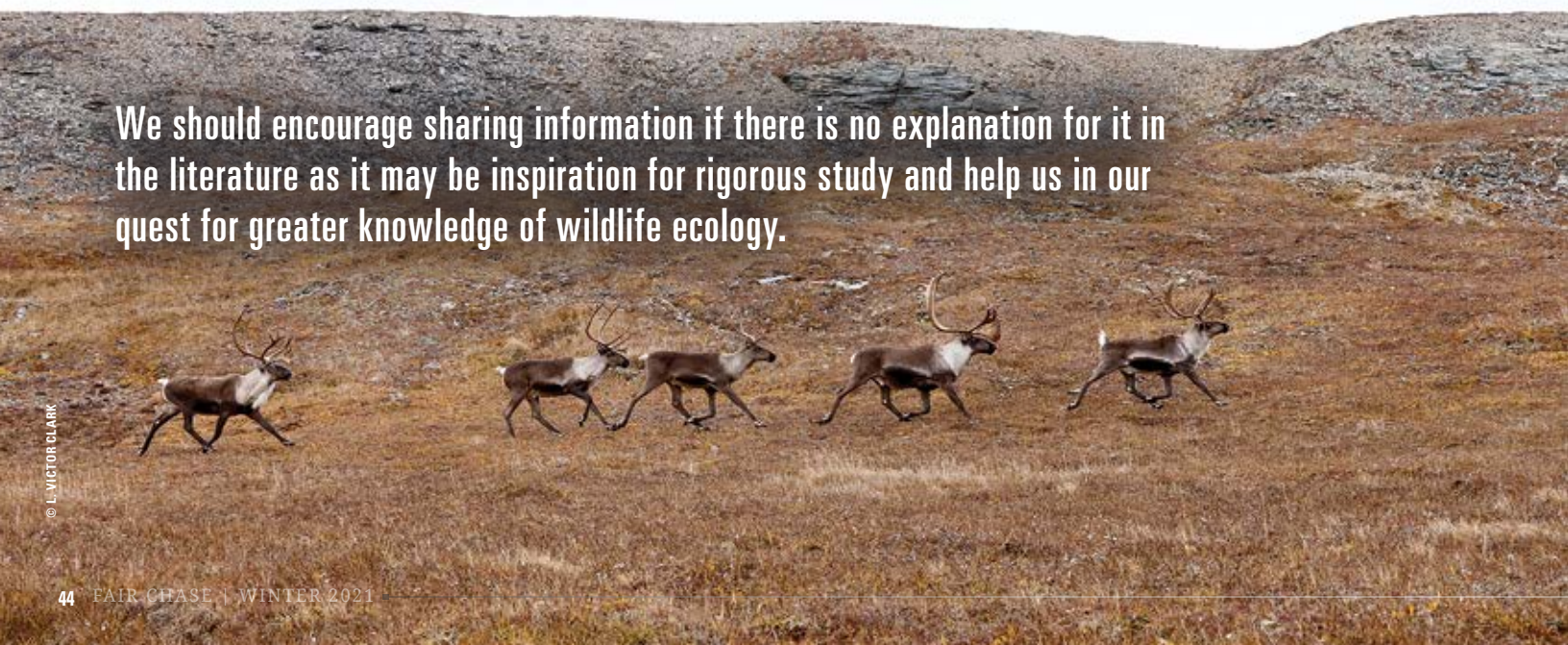
I recently had breakfast with my colleague Dr. Todd Fuller, emeritus wildlife professor at the University of Massachusetts, Amherst and our former graduate student, Dr. Nathaniel Rayl, elk research biologist with Colorado Wildlife and Parks. Todd and I have collaborated on many graduate student studies across the world over the past 30 years, focusing mostly on large mammals including Nathaniel's work on caribou and black bear in Newfoundland with Shane Mahoney.

We discussed the recent passing of B&C Professional member Dr. Valerius Geist, whose work and writings on large mammals greatly influenced us. I mentioned an email Geist sent me a couple weeks before his passing where he shared some observations on the interactions of mountain goats and mountain sheep that were never published. I had shared Geist's email with another colleague, a mountain goat biologist with a state fish and wildlife agency, who lamented that Geist was not able to publish the information because it would have benefited his work greatly. This led to a discussion of the value of publishing natural history observations, and the difficulty in getting these accepted by science journals.

Todd told us a story related to his graduate work in Alberta during the 1970s where, when capturing and radio-collaring caribou, he observed adult female caribou with antlers largely indistinguishable from yearling male caribou antlers. He felt this was worthy of publication because aerial observations on caribou herd composition could easily misidentify these females as males and compromise the data. Todd sent his advisor a draft manuscript, and his advisor responded saying the article was "Mickey Mouse" and would never get accepted for publication. Discouraged, but undeterred, Todd submitted it for publication anyway, and it was eventually published in 1980.

Caribou are the only species in the deer family where females routinely have antlers. Antlers on whitetail does, like beards on wild turkey hens, occur but are uncommon. A study in Pennsylvania documented 1 in 3,500 whitetail does having antlers. Why do caribou females grow antlers and other deer species as a rule do not? Geist, in his classic 1998 book *Deer of the World: Their Evolution, Behavior, and Ecology*, suggested that antlers of female caribou are explained by the high gregariousness of the species, and of little phylogenetic and taxonomic significance. He theorized that, like other specialist species from open plains, female caribou appear to mimic the class of males that they compete with for food within their herds. During winter, barren ground caribou dig craters in snow—a high energy expenditure—in order to access ground lichens. They have to defend these craters against one- to three-year-old males, and dominant individuals will pirate craters dug by subordinates. Old bulls typically have lost their antlers by early winter, but young bulls have not. Thus, Geist theorized, competition with young bulls is the probable reason females need antlers in winter.

Geist speculated that such competition only exists where caribou feed on ground lichens and live in dense rather than sparse populations. He suggested that caribou that live dispersed at low density in forests and feed on arboreal lichens are not likely to compete for feeding craters. He stated that this likely explains why in woodland caribou only a small variable fraction of females has antlers and why they are usually small and asymmetrical.



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Read more about Jim Schaefer's research on Quebec-Labrador caribou on page 26.

This theory was tested by B&C Professional member Shane Mahoney and Dr. Jim Schaefer and published in the prestigious journal *Ecology* in 2001. They studied 15 caribou herds across a 1000 km gradient from Labrador to Newfoundland. They observed that antler possession in caribou is the most reliable predictor of the incidence and outcome of contests over feeding craters, and these contests increase in frequency with snow depths greater than 25 cm. They conclude that the significant relationship between snow conditions and antler carrying supports the hypothesis that antlers may be advantageous to females in interference competition for winter food.

Mahoney and Schaefer also observed that lower percentages of antler-bearing females were linked to higher population densities. This may seem to contradict Geist's hypothesis that higher densities are linked to female antler growth. However, as explained by Mahoney and Schaefer, very high densities result in nutritional stress as less food resources per capita are available. This was demonstrated in lower body weights and reduced body sizes. Antler growth is nutritionally demanding, and it makes perfect sense that nutritionally stressed animals would shift energy away from antler growth toward basic survival.

The early years of wildlife science resulted largely in observational studies. As the profession and its science matured, studies have become more sophisticated with uncertainty over observations reduced—or explained—with advanced quantitative methods. Wildlife science today continues to evolve with methodologies such as Bayesian modeling and inferences, once rare, now becoming standard. Elite wildlife science journals typically have a very low acceptance rate for submitted papers. Many are rejected outright and never make it to the peer review stage. This understandably leaves little room for papers that document natural history observations. Some journals do provide outlets for such papers under sections titled "short communications" or "field notes," for example. We should not consider such contributions as "Mickey Mouse." Rather, we should encourage sharing such information if there is no explanation for it in the literature as it may be inspiration for rigorous study and help us in our quest for greater knowledge of wildlife ecology.