



The World Of Whitetail Antlers Part 1: Why Antlers?

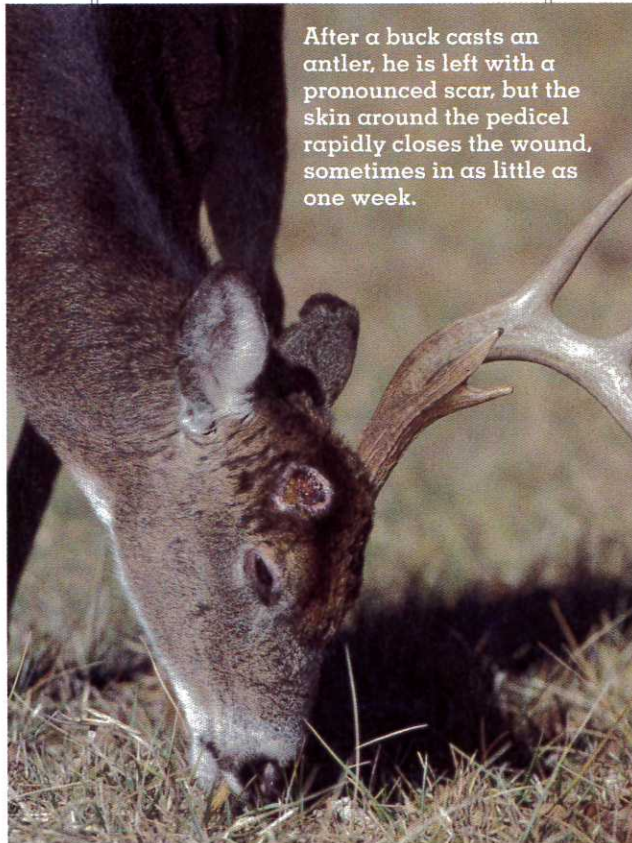
Antlers! They are the stuff dreams are made of, and they seem to have a strange effect on hunters. I have seen grown men reduced to tears over missing a big-racked buck, and unfortunately, I also have seen folks behave in unethical and illegal ways from what I call "antler disease." Yet, in spite of the millions of words written about them, what do we really know about antlers? In this two-part series, I will discuss what I have learned about antler growth in my four decades of whitetail research. This installment begins with one basic question: Why antlers? Then, I will proceed to the anatomical basics and antler terminology. As Will Primos is prone to say, "Speak the language."

ANTLER ORIGIN

Understanding the origins of antlers tells us a lot about how our favorite game animal develops antlers and why. The story of antlers begins five to 34 million years ago. There are dozens of species in the deer family (Cervidae), ranging from the diminutive mouse deer (Tragulus napu) of the Malay Peninsula in southeast Asia to the moose (Alces alces) of the northern boreal forests of North America and Eurasia. The geographic origin of deer appears to be the tropical forests of Eurasia, and the earliest ancestor may have been related to the family containing the mouse deer, which lacks antlers. Both male and female deer had long canines, presumably used for combat or defense.

As forest-dwelling animals, the first deer probably existed in small numbers, since dense forests are notorious for providing little food due to a closed canopy. In order for deer to get together, they had to leave messages

posted at central locations. These messages took the form of chemicals produced by skin glands and left at signposts or staging grounds. The question became, what is the best way for deer to carry out this communication?



After a buck casts an antler, he is left with a pronounced scar, but the skin around the pedicel rapidly closes the wound, sometimes in as little as one week.

PHOTO BY LON LAUBERT/WINDIGOIMAGES.COM

I believe the ancestors of whitetail deer probably had both canines and small, simple antlers that never shed their "velvet." The function of antlers at this point probably was to provide both a display organ for courtship and a large surface area for scent dispersal used in communication. As time went on, the canines disappeared and antlers took on an additional function — combat and defense.

As the ancestors of whitetails moved from the tropical forests to more temperate regions, breeding became more seasonal. As the proto-whitetail moved into the northern parts of North

America, these animals had to deal with changing seasons. In order to synchronize the physiological and behavioral aspects of breeding, whitetails adopted use of day length as a guide. Based on an approximate 200-day gestation, whitetails became short-day breeders, meaning they carried out their breeding rituals in the part of the year during which days were the shortest. However, there are two "short" days in the annual cycle, one in spring (March) and another in fall (September). Obviously, it was "decided" to carry out breeding in the fall, as then the fawns would be born in spring, allowing for greater survival rates.

Deer determine the shortest day length — and, thus, the appropriate time of year for breeding — by doing just the opposite — measuring the length of the night. Whitetails do this by monitoring the amount of melatonin in the blood. This job falls to the pineal gland in the brain. Melatonin is produced when the pineal gland does not receive light stimulation. As the days get shorter, the amount of melatonin in the blood increases. The amount of melatonin then affects the hypothalamus and pituitary glands in the brain, as well as the liver. Together, these organs begin to manufacture several hormones. Elevation of these chemicals initiates and affects the antler cycle.

GROWTH CURVE

Antlers are second only to cancer in their ability to grow quickly. Consider a buck will begin antler elongation around the middle of March and complete antler growth by the middle to end of August. Antlers originate from the frontal bones on two "stumps" called pedicels. Buck fawns begin

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growing pedicels early on and by six months of age may even have tiny hardened tips on their pedicels. In most fawns, however, the pedicels develop and begin growing their first antlers during the next spring after birth. The beginning and end of the antler cycle for two-year-old bucks is marked by casting of the old antler.

As I write this article, it is the first week of March here in eastern Texas, and I just got off the phone with someone excited about finding a freshly worked scrape. "Why are our bucks still breeding?" was the question. I explained that the person was actually witnessing the beginning of the antler cycle. Although I alluded to a group of hormones involved in antler growth, the most important one probably is testosterone. At about this time, we see a brief spike in blood testosterone in bucks, even though the buck more often than not has already cast his antler. We do not know how this occurs, but it may be the result of the spring equinox. At any rate, this brief spike appears to start antler development from the pedicel.

The scar left by the cast antler is not a pretty sight, but our studies clearly indicate the skin around the pedicel quickly grows over the wound, perhaps in as little as one week. I will discuss how antler casting works in the next installment. The skin of the frontal bone, especially around the pedicel, is empowered with the ability to turn into antler. Damage to the pedicel rarely results in a deformity of the antler. Damage to the skin around the pedicel, however, can result in a malformed antler. If even a few cells from this tissue are displaced, it has the ability to begin growing an antler on another part of the buck's body.

For several days, it appears there is nothing going on with the new antler, yet a great deal is going on in the buck's body to prepare for antler growth. Completion and hardening of the antler during the previous year took a lot out of the buck, since he robbed his flat bones to mineralize the antler so lightly discarded in the woods for us to find. By April the stage is set to grow what we hope is an even larger antler. In Part 2, I will discuss what happens during antler growth, what can change the genetic blueprint and the predictability of antler size over the life of a buck. 🍖

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Photo by Petty Officer 2nd Class Sandra M. Palumbo, U.S. Navy - Bahrain, November 6, 2007

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