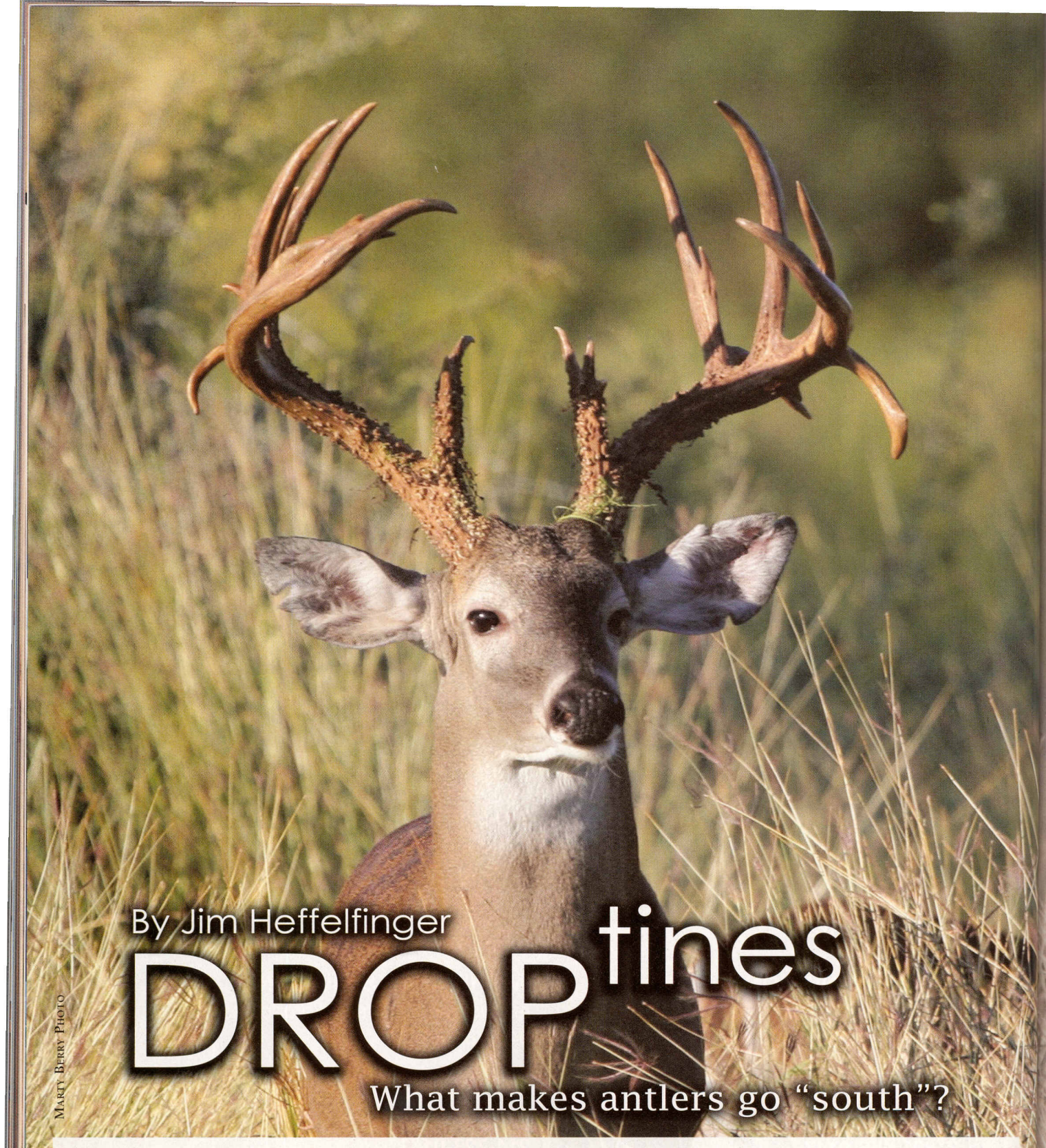

By Jim Heffelfinger

DROP tines

What makes antlers go "south"?

Marty Berry Photo

Every type of deer has a certain antler shape that exemplifies that species. We can identify most species based on nothing more than a shed antler and many of us have a favorite antler shape. (I happen to like 'em w-i-d-e.) For many people, anything *other* than the normal shape is what excites us. Humans have always been drawn to the unusual and extraordinary; no one sits around talking about the ordinary. With our focus on antlers, deer hunters are naturally interested in anything that is not typical.

As far as non-typical tines go, the droptine is as odd as it gets: the upside down point, the drop, the double drop, the anti-tine. If you can't hang a ring on it, it is a point? Droptines and especially the remarkable double droptine have become sacred in deer hunting culture. The logo for Texas Trophy Hunters was chosen because it exemplifies the Holy Grail of trophy whitetails. Some of us are just crazy enough to have memorialized the iconic double droptine image with an electric needle and ink on our left shoulder.

What exactly are these oddest of odd tines and what causes them? There are several factors that can cause or affect the expression of odd antlers or misplaced tines, although in most cases we can narrow down the field considerably. Things such as disease, nutrition, parasites, age, hormones, genetics, and injuries can disrupt the growth of the normal, species-specific shape in antlers. We see the effects of injuries to the antler or major skeletal bone and we also know that some non-typical traits are genetic and show up repeatedly in a buck's sons and grandsons. A quick tour of all the potential factors will allow us to explore the causes of these magnificent outgrowths.

Age

Everyone reading this knows how age affects antler size; young bucks are still allocating nutrient resources to body growth and development, which leaves little for antler development. After the body becomes mature at about 2 or 3 years of age, a buck is able to pass on more nutrients to these "luxury items." It follows then that young bucks are not going to show many non-typical characteristics simply because that requires robust antler growth.

We are seeing some incredible antler growth in captivity these days, with much younger bucks having all sorts of non-typical points. This shows what the species is biologically able to do, but this is not what we normally see in the wild. Wild bucks rarely start expressing odd points like droptines before they are at least 3 years old; more often they're see after 5 years of age.

It's rare we get good information about droptine bucks on successive years, but deer expert Dr. Harry Jacobson (formerly of Mississippi State University) has monitored several bucks in the wild that grew droptines. One particular buck did not grow droptines until it was 6 years old when it had a single droptine. The next year he again grew a single drop, but on the other side! When the buck reached 8 years of age, it had double drops with one side being short and then grew two long (9-10 inches) drops at 9 years old.

Nutrition

Regardless of age, good nutrition is necessary for a buck to maximize his age-specific antler growth. Once his body is mature, abundant nutrition allows the buck to physically express his genetic potential. A buck on poor nutrition may have the genetic basis for something very special, like a droptine, but simply be unable to grow it due to nutritional limitations. Regardless of the cause of the abnormality, good nutrition is necessary to provide the building materials

Injury

Injuries probably account for most of the very freakish deer heads. Physical injury or trauma to either the growing velvet antlers, skull, or a major skeletal structure can result in antler abnormalities. Each type of injury has a different effect on antler growth and knowing more about these processes allow us to guess about any strange antler formation we might come upon.

Any injury to the velvet antler may damage the growing cartilage-like structure and affect the blood flow and the shape of the growing protein matrix. "Acorn points" are a good example of this, where a swollen knob is hardened in the middle of the antler tine from the buck bumping the actively growing antler tip at that stage in development.

Nicks and cuts in the velvet antlers can produce extra points and oddities. This has led some to suggest that the awe-inspiring double droptine might be caused by bucks trying to slip through a fence and getting the underside of their main beams caught (and nicked) on a fence strand.

Gamekeepers in early Europe reportedly would jump-shoot red deer in the summer to shoot their velvet antlers full of bird shot. The intent was not to kill the deer, but to pepper the growing antlers with lead pellets to cause non-typical points to proliferate. Much later, a researcher tested this by implanting small iron balls in growing antlers and found that it did, indeed, produce extra points. Likewise, parasites such as ticks on velvet antlers can, in some cases, cause malformed antlers if they disturb the velvet enough.

The disruption of blood flow is not the only cause for unusual antler growth, however, as the living velvet is full

In 2009, TPWD game warden Eric Minter arrowed this tremendous 5½-year-old buck with 31-points including two nice droptines.

ERIC MINTER PHOTO

of nerves. Bucks in velvet do a pretty good job of protecting their antlers because they are sensitive during that phase of the antler cycle. Those working with captive deer know that bucks do not like their velvet antlers touched. These nerves not only make the antlers sensitive, but we know that nerves are very important to the development of the species-specific antler shape. In the 1940s, pioneering antler researcher George Wislocki cut the trigeminal nerve to the antlers and found that they did not grow the correct shape and the deer were not careful and damaged the antlers by hitting them on objects.

Famed antler researchers Anthony and George Bubenik conducted a lot of classic work on antlers and the role of nerves in antler development. In their captive whitetail herd, the Bubeniks noticed that antlers injured during growth not only produced an abnormal growth at that location, but sometimes reproduced that odd growth even larger on the next 1 to 2 sets of antlers. Since the antlers were shed and regrown, how could that non-typical point be reproduced on future sets of antlers? These occurrences led the Bubeniks to hypothesize that the nerves in the antlers were communicating with the central nervous system and this information was stored somewhere in the body. This means that we may not always be able to label a droptine as "genetically caused" just because we see it in multiple years.

Obviously, serious breaks to the growing antlers are going to cause the rack to grow "funny." It is common for broken or partially broken antler beams or tines to heal in place because the velvet holds it all together, although sometimes it heals at a different angle. This usually disrupts the antler growth enough to cause extra points to also sprout or cause the tines to be crooked. In cases where the tine or end of the beam hang down, this re-fusing will leave a pendulous, or hanging, tine that sometimes has a large rounded tip. These bulbous and dark tips are from the pooling of blood at the bottom on the broken tine and they usually retain their velvet at the tip.

So, some droptines are caused by injuries to the growing antlers. We can usually tell those that are related to an injury because the antler will have some evidence of trauma or damage during growth. Extra-calcified material near the droptine or antler beams and tines at odd angles usually signal an injury. Most double droptines are probably not due to a buck injuring his antlers on a fence wire. Bucks are very careful with their tender velvet antlers and are normally quite skilled in negotiating fences.

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Genetics

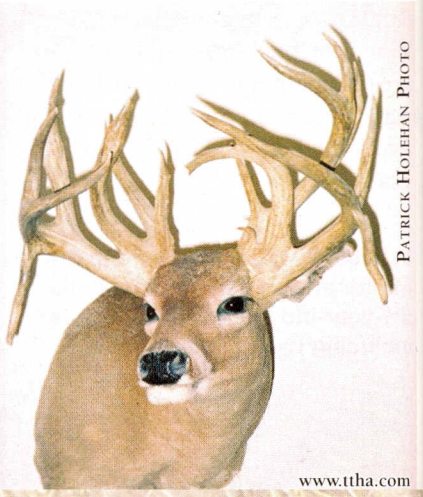
There is no one "antler gene" that dictates how big or what shape a buck's antlers will be. Relationships between genes and physical characteristics are rarely that simple. There are many genes that act together to determine the shape, size, and mass of a buck's antlers, and the expression of these genes is related to his ability to efficiently process his nutrient intake and survive to a ripe old age.

Many odd points and abnormalities are the result of the

Left photo: Larger droptines may be dark at the tips from blood pooling at the bottom. Center photo: This buck has what looks like a clean genetically-induced droptine, but the extra browtine and kicker point raises suspicion that there may have been an injury to the growing antler velvet. Right photo: Bizarre antler pedicles have produced double mainbeams.


WI DNR Photo

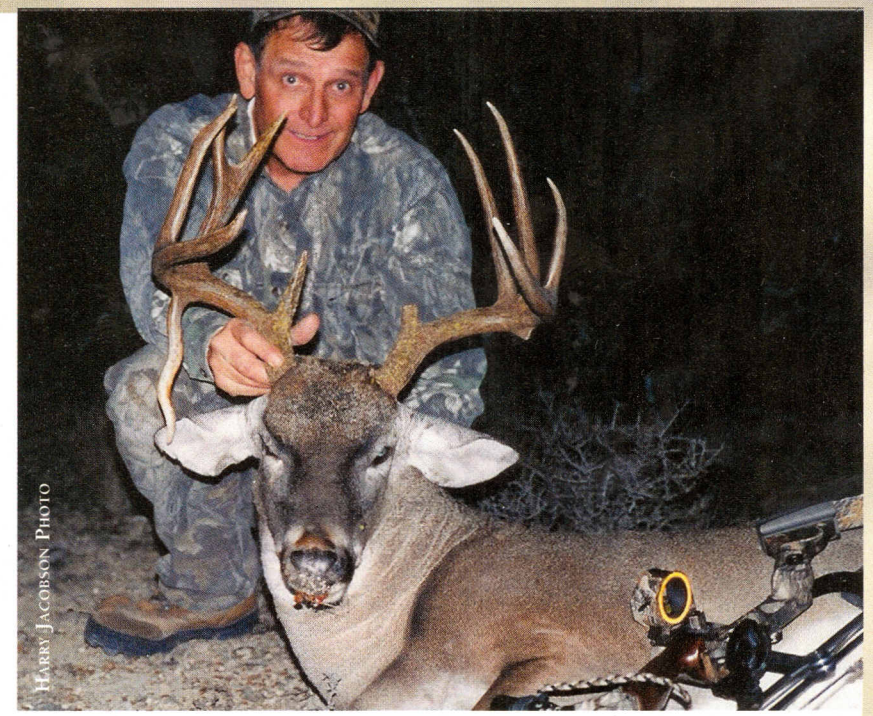

Author Photo


Patrick Holehan Photo

animal's genotype, or genetic blueprint. We know that antler characteristics are inherited from the buck's parents, because a non-typical buck will usually produce a disproportionate number of male offspring with non-typical points. Also, females contribute half the genetic blueprint for antler qualities to their offspring. As a result, females that had non-typical fathers may consistently produce buck fawns that grow up to be non-typicals even when those buck fawns had different fathers.

Genetically programmed antler abnormalities can be seen year after year in an individual. A buck might have a small bump on the underside of his main beam at 4½ years old, then a 2-inch droptine in the same spot the next year and a 7-inch droptine at 6½ years old. Also there can be geographic clusters of certain characteristics. For example, I have seen certain ranches that produced a high proportion of double browtines (two on each side) or forked back tines (G2s). All this is evidence of the effect genetics has on certain antler characteristics.

Droptines that descend out of the lower part of the beam cleanly with no sign of trauma are most likely of genetic origin. I suspect most droptines are there because the buck had the genetic programming for them and lived long enough to prove it.



Dr. Harry Jacobson, Professor Emeritus at Mississippi State University, took this 8 plus-year-old buck in northern Mexico with his bow. The second droptine on the left antler was unfortunately broken off.

Antlers that head south

Boone and Crockett bucks in general are rare, but they are a dime-a-dozen compared to finding a droptine buck. No one has very good data from the wild on the frequency of droptines. Those with captive deer herds at Mississippi State University, Donnie E. Harmel White-tailed Deer Research Facility at Kerr WMA, University of Alberta and in Kingsville report that droptines are rare even in these herds where bucks are fed as much nutrition as they want until they die of old age. The Caesar Kleberg Wildlife Research Institute, in cooperation with the King Ranch and many others, have been capturing more than a hundred free-ranging bucks per year in South Texas for more than 10 years with well over 4,000 bucks captured to date. They have not completed analyzing this growing mountain of data, but Dr. David Hewitt at Texas A&M University-Kingsville, confirms that droptine bucks are exceedingly rare on the areas they have conducted their captures.

Droptines may come and go through a series of years as Dr. Jacobson's experience in wild deer shows. Dr. Hewitt had one buck in captivity in Kingsville that grew a droptine on one side at 8 years old and then no droptines for the next 3 years before growing a droptine on each side at 12 years of age. Science has not unraveled the mystery of disappearing droptines yet, but variations in nutrition might affect the expression of genetic droptines, and if they are caused by injuries that can occur randomly throughout a buck's life.

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The value of droptines is purely psychological. They are actually counted as *penalties* in the Boone and Crockett scoring system for typical antlers. So, our upside-down point is literally counted as negative inches. This is because Boone and Crockett's intent was to celebrate those heads that were not only large, but showed the best symmetrical representation typical of that species. I know of no hunter who thinks of a beautiful pair of droptines as something that should be penalized. On the contrary, most hunters feel that the deductions in this case are irrelevant compared to having such a unique freak of nature.