

It's Normal, Stupid!

By Dr. James C. Kroll, Ph.D.

In 1973, I made a serious decision to change my career. Up until that time I had been a non-game/-endangered species biologist. Growing tired of not being taken seriously by landowners, I decided it was time to work on deer. Why? Landowners were *interested* in deer. If I could develop useful information about whitetails and management, it might go a long way towards gaining the confidence needed to effect changes in the way land was being managed. Then, at least indirectly, I could save habitats for non-game animals.

The strategy worked—I've been able to produce positive results, not only for deer, but for many lizards, birds, small mammals, and others, as well—but my decision did not garner support from most of my colleagues.

One of those "most" was actually one of my early heroes. You've probably never heard of Dan Lay unless you're an old biologist, and that's a shame. Dan was one of the first biologists hired by what then was called the Game, Fish and Oyster Commission of Texas. Along with fellow biologist Phil Goodrum, Dan helped developed many of the management techniques still in use today. His specialty was bobwhites, though he ended his career working on red-cockaded woodpeckers. I valued his opinion and advice, and although he passed away many years ago, I still use much of what he taught me. But on the day I made my career swap, he was very upset with me!

"I can't tell you how disappointed I am in your decision," Dan chided. "You are a promising young biologist in a new field, and now you're throwing it away to work on an animal we know *everything* about!"

For one of your heroes to question your judgment is not a pleasant thing. I went away with second thoughts. Yet I was steadfast in my decision, and must say never have I regretted it. On this one occasion, Dan was totally wrong. "Everything" was not known about whitetails. In fact, it's only in the 35 years since that we've developed the vast majority of information about whitetails we now consider common knowledge. Ever heard of infrared triggered cameras, food plots, and feed specialized for deer? How about rutting behaviors such as sign-posting and staging areas? Do the terms "sanctuaries," "travel corridors," and "grunting" sound familiar? They *all* were discovered in the last 35 years.

Although all the "low hanging fruit" has been gleaned about whitetails, I can't help but believe there is probably a great deal more to learn; I certainly don't want to fall into the trap of pronouncing that everything's known about deer. But the new generation of biologists who someday will replace guys like me seem to have rather short arms! Instead of focusing on being keen observers, which leads to new discoveries, the focus seems to be on re-plowing old ground. Rather than finding innovative new management techniques, these guys seem to obsess on proving the old ones don't work.

Here's a good example, one I've been keeping records on. Every five to seven years an enterprising young wildlife biologist will give a presentation at a professional meeting and/or publish an article in a scientific journal showing how aging of whitetails by tooth wear and replacement (Severinghaus technique) is not accurate. Immediately, editors of popular magazines—eager for new material—jump on this like the proverbial duck on a June bug. In no time, this new "discovery" is broadcast to a new audience of landowners and managers through various media outlets.

My data indicate at least a dozen such occurrences have happened since I began keeping records. Since very few young biologists read the literature anymore, their professional colleagues applaud the work as "new." And the readers of periodicals such material appears in never pick up on the repeat due to the years that go by between these recycled stories.

Of course, aging deer by tooth wear and replacement is not totally accurate. Neither are any of the other, more involved techniques such as sectioning the incisor teeth or weighing the dried eye lenses! These are biologi-

cal phenomena, and in biology there are no absolutes. Measure any physical trait of an animal, in this case whitetails, and graph the distribution of the results. In almost every case, the result is the "normal curve" also known affectionately by college students as the "bell-shaped curve." Here's a simple, silly example.

Suppose we measure the right ring finger of all adult humans. I actually had to do that once when I was involved as an expert witness in a lawsuit. See, a fellow had jumped down off his screw-in steps leading up to his hang-on stand. He was only three feet off the ground, so what could happen? His ring caught on the cleat of the step and pulled his finger off! The defendant insisted it was a freak accident, while the plaintiff maintained the step was dangerous.

I randomly selected 100 adult male humans and measured the length and width of their right ring fingers. The result was a normal curve, extending to each side of the average width of the ring finger. Guess what? The average was exactly just a hair smaller than the width of the cleat. A person jumping down from the steps easily could catch their ring finger on the cleat, producing the horrible result. The defendant settled out of court. (Of course, had I been on the other side of the case, I could have focused on the fact some of my subjects had really fat fingers! If the victim had been fat, it might have made a great defense, by focusing on the exception rather than the rule.)

This elementary concept about biological systems—the exception is *not* the rule—seems to evade many biologists. In deer management, we strive to be right more than we are wrong. That's the best we can do, because we work with the average. The correct term for the *exception* is "standard normal deviates." So the next time you read an article that purports to reveal some new discovery about whitetails, please remember this column. This kind of stuff is interesting, but it does not have a great deal to do with managing deer.

Let's look at aging jawbones as an example, but before you do, ask why we age harvested deer in the first place. There are several legitimate reasons, such as monitoring the age structure of the harvest over time to assure we are not taking too many animals or to see if our management program is affecting antler quality by age group.

If we came up with a technique that would tell us the exact day a deer was born, would it improve deer management? No. All we really need to know is what proportions of animals, both in the harvest and in the herd, are in the following age classes: fawns, yearlings, immature, mature, and over-mature. The Severinghaus technique generally allows us to do this, and most published studies have concluded that, most of the time, we can place harvested animals in these categories. Whether or not a buck is 6½ or 9½ does not affect the fact he is over-mature! And whether he is 2½ or 3½ still makes him immature. If one buck you thought was 5½ years old actually ages out at 6½, will that destroy your herd?

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Using a supercomputer, we ran over a million simulations (taking into account aging error), to compare the real age structure of the herd to that generated from jaw bones. What we found was that the greatest effect came from sample *size*—if you take a very small sample of jaws, the error was greater. Yet in most situations using adequate sample sizes, the interpretation of age structure was correct (and would therefore have had little impact on management decisions).

Now, does this mean we should not use techniques such as the cementum annuli (CA) method? Absolutely not! The CA technique is a good one, and there are several labs providing these services. If you want to have a better idea how old your buck was, by all means use the method—I do, regularly. But I still use the generalized age groupings and other data from harvested animals in making management decisions.

If you go to your physician not feeling well, does he simply take your temperature and tell you what is ailing you? Of course not. He collects a blood sample, looks in your throat and at other parts, takes your blood pressure, etc. Only after he has examined as many diagnostics as possible does he come up with a possible diagnosis. The same holds true for deer biologists and managers. I would hate to make management decisions based just on looking at a jaw bone! The more data you collect, the better your chances of making the right decision.

My point here is that there are biologists who are new and trying to make a name for themselves. If they truly want to do that, I suggest they work hard and add something meaningful to our knowledge about whitetails. "Discovering" something that happens in the far tails of the normal curve does nothing but confuse landowners and managers. We do not manage for the extreme, we manage for the average.