

WAYNE C.
VAN ZWOLL

B&C PROFESSIONAL MEMBER
Photos Courtesy of Author

Understanding

Marcel: after Marcel Grateau, an early 20th-century French hairdresser whose signature style was even waves applied with a curling iron. What did that have to do with moose?

“We were sitting in a wild rose thicket rattling a bone knife-handle across the tines of a shed antler,” recalled Annabel. It hadn’t yet summoned a bull. Hard wind “was screaming off the tall Talleetna peaks, filling the air with a blizzard of autumn leaves.” But wind wasn’t jerking the snag that had caught Doc’s eye. A moose, mostly hidden, was polishing its antlers. Doc readied his Springfield.

Together the hunters sneaked closer, Doc in the lead. For a better view, he climbed onto a fallen tree and made his way, “teetering under the rowdy slaps of the gale, up the tilted, lichen-slippery trunk.” Then he stopped. And stared....

They’d first seen the marceled bull after stumbling, under full packs, through thickets hemming the Susitna. Scrambling up a steep bank, they crested so near the moose “I could have hit him in the ribs with a rock.” His swollen neck “barreled out from jaw to shoulder. I could see the wicked flare of green in his deep-set little eyes, and the coarse ruck of his mane as it started to lift.” The antlers were heavy, and wider than half his body length. But what distinguished them was a wave near each tip, a dip-and-flare, “jaunty and rakish.” Eyes locked on that prize, Doc shrugged off his weighty pack for the shot. Alas, a strap caught his belt knife, flipping him backward off the bank. He landed hard, “amid a clatter of rocks and pots and pans ... in a clump of devil’s club.”

Now, five days later, the hunters had little better footing when Doc froze on the windfall. Below: a mob of moose, sheltering from the wind. Cows, calves, bulls. Great



Still all-around champ, the .30-06 has sired many fine cartridges. Left: P.O. Ackley's .30-06 Improved.

Ammunition

white palms gleamed far into the shadows. Doc eased forward for a better look. The windfall creaked. A cow stood. The stampede brought the marceled bull into view. Doc threw his rifle up and fired. Before he could send another bullet after the galloping moose, the tree gave way....

Back then the Susitna, still recovering from fires of the 1920s, had raised a crop of aspen and birch just tall enough to feed moose above the snow. Bulls were everywhere; but Doc had declined many, “withstanding the temptation of lesser heads, undismayed by difficulties.” His hasty shot, it turned out, would clinch his reward: the elusive antlers with the wavy tips.

Unlike that bull, Doc’s rifle was most ordinary. Between the world wars and long after, 1903 and O3A3 Springfields abounded. I saw them for less than \$30 when I didn’t have \$30. Semi-finished stocks from Stoeger and Fajen adapted them for scope use, added an adult length of pull and spared hunters the jab of a steel butt. Sportsmen of means engaged stockers and metalsmiths at Griffin & Howe.

The Springfield made the .30-06 the most popular big game round in the U.S., as hunters shifted from lever-action rifles of the 1890s to bolt-actions pioneered by the Mauser and Krag. Winchester would sell 581,471 Model 70s between that rifle’s 1937 debut and its 1963 overhaul; 208,218 were in .30-06.

A “Shooter’s Bible” list of cartridges in 1941 included just seven still offered in commercial bolt rifles state-side: .250 Savage, .257 Roberts, .270, 7x57, .30-06 and .300 and .375 H&H Magnums. Before the war,

Once upon a time, you just matched headstamp to barrel inscription. Not anymore!

Through the 1950s, hunters used the .30-06 for the toughest North American game. It’s still a match!





TOP: The .30-40 Krag, our first smokeless round, is about kaput. Too bad! It's lethal on game as big as elk. ABOVE: Our first mid-bore magnum, the .300 H&H or "Super .30" arrived in 1925. Have we needed another? BELOW: Since 1912 the .375 H&H has taken the toughest game. New bullets, loads, rifles make it even better!

Winchester barrels bored for the .300 H&H were marked simply ".300 Magnum," because there was only one! A tsunami of new cartridges flooded the wildcatting decade of the '50s. It rolled on into the 21st century. Hornady now lists ammunition for 40 bolt-action big game rounds! It catalogs 16 loads for the .30-06, 24 for the .308! In '41 only the .30-40 Krag and .30-06 boasted more than a half-dozen loads, across Remington, Peters, Winchester and Western brands!

Were duplication a felony, you could sentence most cartridges and loads peddled today. Still, shooters welcome choices. Some new cartridges are task-specific – like boosting ballistic credentials downrange or wringing higher velocities from short barrels. Others fill gaps in earlier rosters and replace obsolete numbers. Handloaders have benefited from the wash of fresh factory loads, scooping up their cases, powders, and bullets as components.

Bullets have undergone the most visible changes. Early jacketed softpoints had round or flat noses, with plenty of exposed lead to prompt upset at modest impact speeds. As those velocities approached Mach 3, however, bullets came apart. The brilliant Charles Newton, whose big rimless .30 matched the later .300 H&H ballistically, designed a pointed bullet with a wire nose to control upset. A paper liner under the jacket kept bore friction from melting the core. Remington's Bronze Point featured a nose peg to initiate expansion, while Western Tool and Copper Works bet on a stout hollowpoint. The nose cavity of DWM's Strong-Jacket bullet was lined with copper tubing and capped. Winchester marketed a Precision Point bullet whose gilding metal nose cone gripped the jacket. The Peters Protected

Point was similar, a "driving band" under its jacket managing upset. These were costly bullets, requiring as many as 51 operations and three hours to complete! Winchester's more economical Silvertip, sans driving band, followed.

After the debut of the .270 and .300 H&H in 1925, bullet-makers focused on penetration and core-jacket integrity. Remington's reliable Core-Lokt came on the heels of the Peters Inner-Belted. In 1947, John Nosler developed a bullet with two cores either side of a mid-jacket dam, after the German H-Mantle. Much later, Nosler and Winchester would collaborate on the Partition Gold, moving the dam forward to boost retained weight and installing a steel cup to protect the heel. A similar cap in Winchester's short-lived but effective Fail Safe bullet prevented its heel from ballooning and possible rupture from the curling petal tips of the copper-hollowpoint nose. Speer's Grand Slam had no mid-section dam, but its two-part core was harder in the rear than up front; its tapered jacket stiffer at the tail than the nose.

The trend to more complex bullets was lost on many hunters getting great results from ordinary softpoints. My first whitetail fell to a Winchester Power Point, first elk to a Speer Mag-Tip. A Remington Core-Lokt claimed a buster of a mule deer. Affordable bullets from Sierra and Hornady were so accurate and lethal, I wondered why handloaders would spend more. For most of us innocents in the '60s and '70s, the weight of a spent bullet mattered not. The important measure: an animal quickly dead.

Bonding came of age in the 1980s, courtesy Jack Carter's Trophy Bonded bullet (now produced by Federal Cartridge). Its thick ductile jacket was joined chemically

to a lead core. Bill Steiger had pioneered bonding with his Bitterroot bullets. Now used by other semi-custom bullet-makers like Northfork, it's also a signature feature of Swift's Scirocco, Nosler's AccuBond, Hornady's InterBond, Remington's Core-Lokt Ultra Bonded, Norma's Oryx and Winchester's Expedition Long Range and Power Max Bonded. While they produced beautiful mushrooms, heavy, unalloyed copper jackets on early bonded bullets made them long for their weight, and fouled bores more quickly and stubbornly than did gilding metal (copper/zinc) jackets.

Eliminating a bullet's lead core would make it even longer. Breech pressures would escalate, as copper doesn't "take" rifling as easily as lead. Copper fouling would increase. But Randy Brooks thought most bullet failures in game were caused by lead loss. So in the Utah shop

where he and his young family produced "Original" lead-core Barnes bullets, he developed an all-copper hollowpoint. He dubbed it the X-Bullet, "because the nose peels into four petals, forming an X." Randy and Coni used the X-Bullet on dozens of game animals, from Alaska to the African veldt, and it soon became the Barnes flagship. Then Randy machined three shank grooves—"slots for displaced copper." Result: less fouling, lower pressures, better accuracy. In 2003 this bullet became the TSX, or Triple Shock.

Other bullet and ammo firms followed suit, Federal with its Trophy Copper and new Power-Shok Copper, Winchester with its (Nosler's) E-Tip. Lead-free bullets became a trend. Hornady's GMX (gilding metal expanding) "is 95 percent copper, 5 percent zinc," says Jeremy Millard, whose team developed it, "same as our bullet jackets. The nose cavity halts expansion at the base of the ogive." Cut from wire, then swaged, GMXs cost about 40 percent more to make than lead bullets. In 2011 Hornady married the GMX shank with the resilient FTX tip of LeverEvolution ammo. As gilding metal is harder even than copper, it can't grip polymer

noses as well as does lead. So the MFX (Monoflex) tip has an extra-long stem.

The FTX tip had first appeared in LeverEvolution ammunition, which Hornady developed with pointed bullets to juice up traditional deer cartridges used in tube magazines. The spongy FTX polymer cushioned the jar of recoil so bullets wouldn't detonate primers in front of them. For long-shooting with bolt rifles, though, Hornady found hard tips superior. "Friction from air at speeds near Mach 3 heats tips," explained Jayden Quinlan. "Temperatures can reach 800 degrees. Tracking bullets with Doppler radar, we saw ballistic coefficients change during flight, increasing drag. The polymer tips were starting to melt." Hornady responded with the ELD-X bullet. Its Heat Shield Tip has a melt threshold of 700 degrees, twice that of Delrin and nylon. Federal followed with its similar TLR Edge bullet. Hard polymer tips offer no advantage on bullets lacking the speed or flight time to get hot, or with ballistic coefficients under .550.

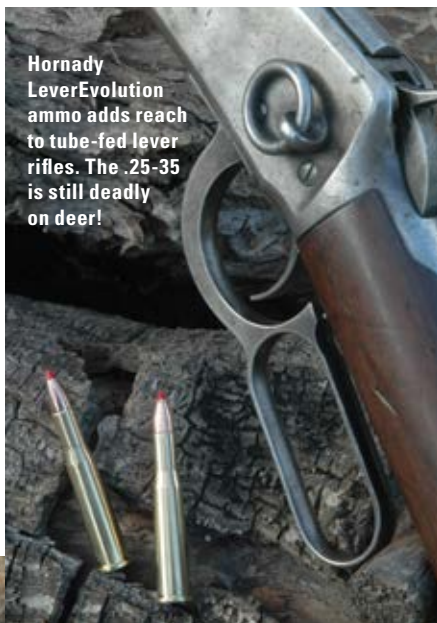
Ballistic coefficient. It's a term you wouldn't have heard in Depression-era moose camps on the Susitna—though it dates to the development of chronographs in the 1800s. Bandied about now by long-range enthusiasts, it's often misunderstood. "BC" or "C" is a number that tells how a bullet reacts to drag, relative to a standard: C = drag deceleration of the standard bullet / drag deceleration of an actual bullet of similar shape and density. In 1881 Krupp in Germany published data that led a Russian, Mayevski, then U.S. Army Colonel James Ingalls to deceleration models with bullets shaped like artillery shells. In 1917 ballisticians adopted a standard profile more like that of modern bullets. Abbreviations G1 and G7

refer to bullet shape, the "G" for Gavre, a French commission that explored C early on. G1 shape dates to the 19th century; G7 is current. A 143-grain 6.5mm ELD-X bullet has a G1 C of .620, but a G7 C of .311. Though it can be calculated with a formula, C is best determined using actual bullet flight times.

Telephones still had dials the last time I killed game beyond 250 yards, so C doesn't matter to me as much as terminal performance. Most expanding bullets will upset down to impact velocities of 1,600 fps, but Jeremy Millard says: "Copper resists expansion below 2,000 fps unless the nose is too fragile to endure high-speed impact." But Jared Kutney at Federal says TLR Edge bullets from a .30-06 will open at 900 yards. Swift CEO Bill Hober insists Sciroccos expand down to 1,440 fps. As five of my last six elk wilted inside 55 yards, such thresholds seem low indeed, given the exit speeds of modern bullets. But as shooters take longer pokes at game, bullet-makers seek wider "expansion windows." Most engineers tell me hollowpoint bullets designed primarily for long-range accuracy give unreliable—thus, substandard—terminal performance in game.

By the way, the term "controlled expansion" can mislead. All bullets have throttles on upset: core hardness, bonding, nose exposure, cavity dimensions, jacket type, thickness, taper, dams, crimping and scoring.

Some hunters prefer bullets that exit, for easier trailing of hit game. I'd as soon a bullet dump all its energy inside, and expire under the off-side hide. If I've made a good shot, the animal won't go far. It will have absorbed all that bullet's destructive power. On the other hand, game quartering away requires penetration that



Hornady LeverEvolution ammo adds reach to tube-fed lever rifles. The .25-35 is still deadly on deer!



Most big game is shot inside 100 yards; bullets must open and penetrate well after high-speed impact.

delivers pass-throughs on side-to shots. So on easy pokes through the front ribs, I expect exits. Lead-free hunting bullets seldom open as broadly as lead-core missiles, and their exit wounds are typically more modest. Last fall a friend shot an elk through both lungs with a lead-free bullet from his 7mm Magnum. The elk galloped off with a small herd. My amigo found no blood. Hours later he came upon the dead elk back near the impact site—one last, desperate jump at right angles to the track. Heavy hair below the high exit had caught what little blood leaked there during the elk's mad rush.

Another time, I saw an eland hit in the chest, face-on, by a lead-free .375 bullet. A native tracker kept us on the trail for hundreds of yards. I found the spent missile bulging the skin on a hip of the huge beast. One petal had collapsed into the nose cavity; the others had blossomed only to shank diameter. The bullet had drilled a long, narrow channel, like a solid.

Energy transfer hinges on a bullet's action, as well as its speed and weight. But how much energy must it bring? In

a 1940 ad, Savage hailed the "mighty power" of its .303: "over a ton of energy ... power to spare." While a ton of energy sounds prodigious, flight quickly saps it. During its first 100 yards, the .303's 180-grain bullet loses 500 foot-pounds. At 200 yards it delivers only about 1,100—a modest figure now when a .243 carries as much to 300 yards! Still, the .303 Savage and its 1890s siblings, the .30-30 and .32 Special, have lost none of their luster. They're mighty next to the .25-20 that felled James Jordan's fabled buck! (It mustered just 405 foot-pounds at the muzzle, 275 at 100 yards!) John Plute better matched cartridge to game when he used a .30-40 Krag to kill his record elk. A ton of energy at 100 yards still floors big bulls. The .300 Winchester carries a ton to 400; but seldom is a 400-yard poke your only option.

Last fall a bull elk and I came together on a steep, forested slope. My bullet zipped through the only slot available, for a hit high in the forward ribs. A second left just as hillside rubble gave way, all but spilling me backward. I scrambled upright palming the bolt. By great good luck, a

shoulder popped into an alley as I crushed the trigger. The elk collapsed.

I was using a .30 Gibbs, an unnecessary cartridge fashioned by Rocky Gibbs, who in the 1950s developed wildcats by moving the shoulder forward on the .30-06 hull. Forming cases requires bumping '06 necks to .33 or so, then necking them in a Gibbs die, then fire-forming. This .30 holds more powder than its parent but kills no better. The Springfield that took the Wyoming bull isn't particularly accurate, but at 40 steps it didn't have to be. I use it because old Springfields and old cartridges entertain me when elk give me the slip.

The Earth is awash in more potent factory-loaded .30s. Quick to mind: nearly a dozen that hurl 180-grain bullets at over 2,900 fps, from the .300 H&H to the .30-378 Weatherby. Ammo lists are packed with hot 7mms, .338s and, most recently, 6.5s. But it seems to me hunters haven't needed a new hunting cartridge since the Great Depression.

For deer, sheep and pronghorns beyond reach of the .25-35 and other top sellers in early Marlin, Savage and Winchester lever guns, the peppy .250 Savage and .257 Roberts still excel, as do the 6.5x55 and 7x57, our gifts from Swedish and German Mausers. The .30-06 and .300 H&H flatten elk, moose and even big bears. The .303 British may have killed more Canada moose than any other cartridge. The .300 Savage, circa 1920, offers all the smash of the Brit and the Krag. The .270 carries to 300 yards the energy that trio brings to 100—so how is it not an elk cartridge? By 1936 Winchester's .33 in its 1886 rifle would accede to the .348 in its Model 71. Hunters boarding a steamship for Africa brought a Model 70 in .375. All these can be zeroed at 100 yards for 150-yard point-blank range; some perform swimmingly with 200-yard zeros. This cob-webbed clan will fill freezers as handily now as it did then—provided you keep your footing on windfalls and hillsides. ■



Ballistic coefficient means little at 40 steps. Wayne got this bull with a Speer bullet from a .30 Gibbs.

