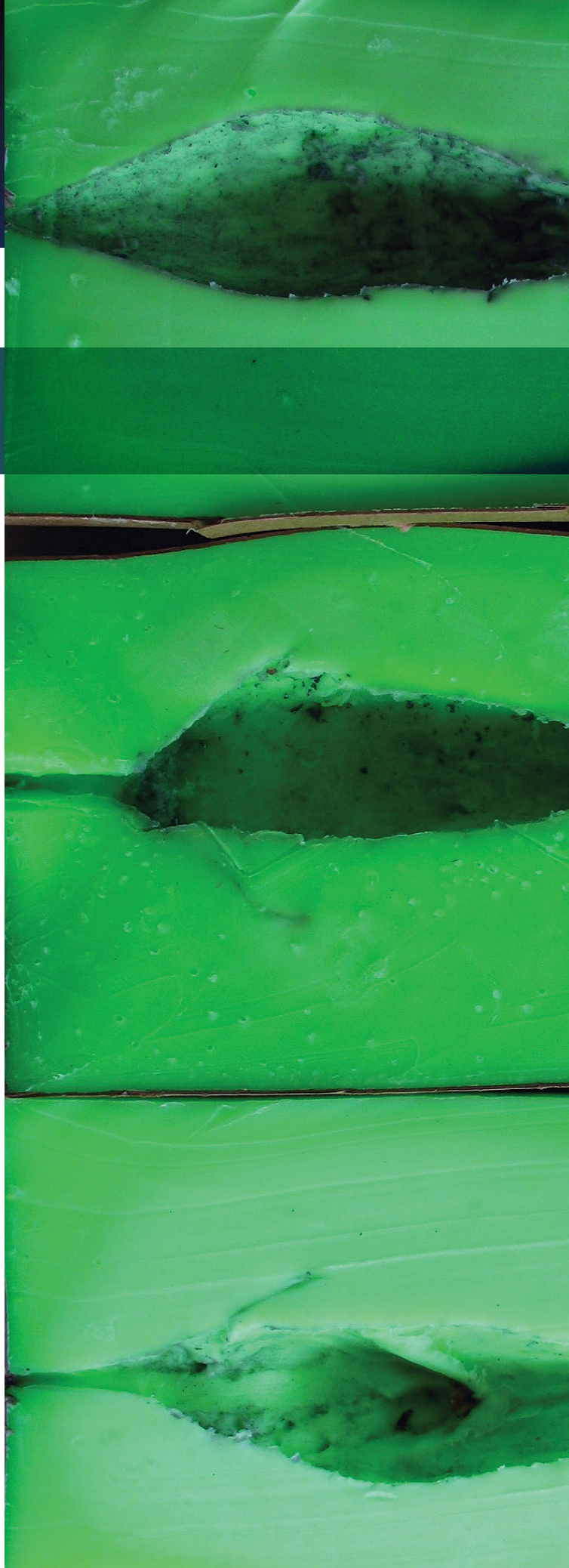
The Modern Bullet

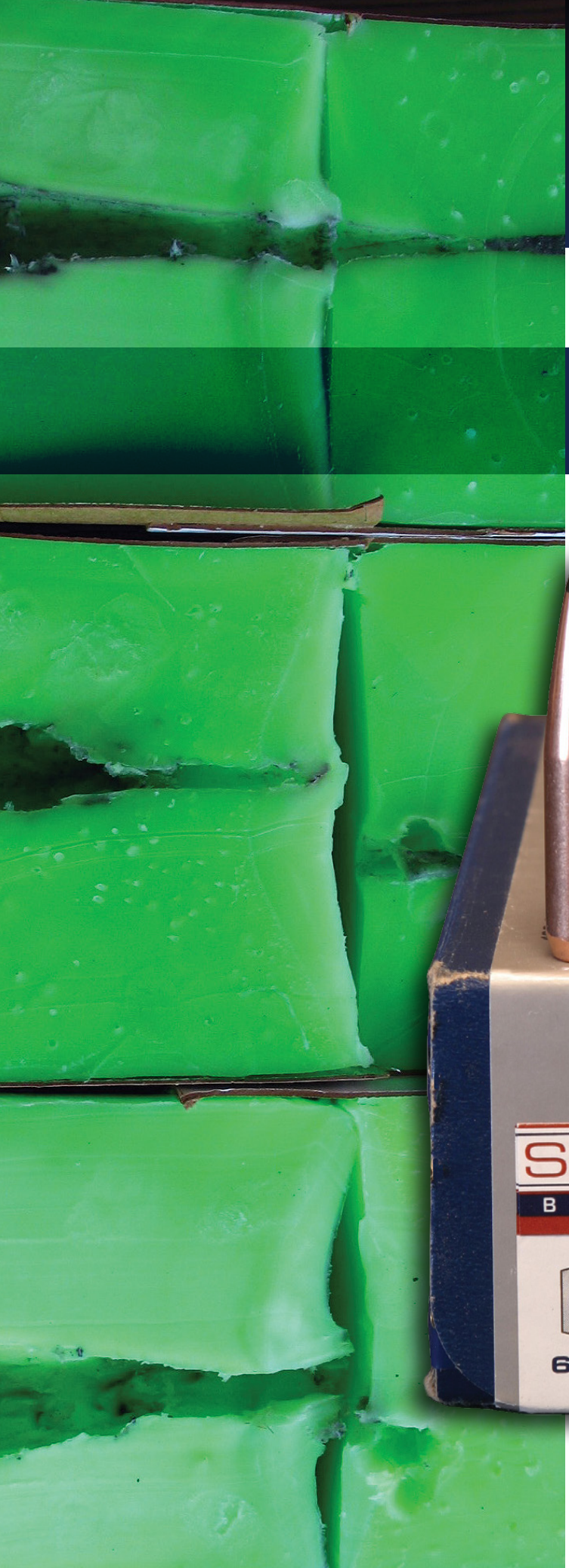
Designs That Changed the Way American Hunters Think

By John Barsness

The first bullets to change the way American hunters think were the early softnosed jacketed bullets for smokeless cartridges. Their construction was what's known today as cup-and-core, with a lead core inside a "cup" of harder metal. Theoretically, these bullets would expand to a mushroom shape, making a big hole inside an animal – though they didn't always work as planned, especially after hitting bone.

The really revolutionary aspect wasn't actually the bullets, however, but far more velocity than possible with black powder and lead bullets, flattening trajectory enormously. Today we think of the .30-30 WCF as a plodding woods round with a tennis ball trajectory, but when it appeared in 1895, hunters used to the .45-70 delighted in holding dead-on out to 150 yards or farther.





Left, the top bullet channel is from a conventional lead-core bullet that started expanding as soon as it hit the material. The bottom two bullet channels are from Berger Hunting VLDs, showing the characteristic delay in expansion. **Below,** the Swift Scirocco II combines a plastic tip with a bonded core to create a high ballistic coefficient bullet that shoots flatly and holds together to penetrate deeply.

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Not just the boxes of Nosler Partitions have changed over the years; the bullets have as well. (The red box is from Nosler's first shop in Ashland, Oregon.)

During the first half of the twentieth century, velocities continued to rise, both at the muzzle and downrange, as powders improved and spitzer bullets became common. Some bullet companies coped by making jackets thicker. The Remington Core-Lokt is perhaps the best known of these, with a jacket supposedly shaped like an hour-glass, locking the core inside the thicker waist of the jacket. In reality, the jacket is the same thickness along the shank, but a cannelure makes it appear thicker in the middle. The Core-Lokt is still made today, though only the few round-nosed models retain the truly heavy jacket. Spitzer Core-Lokts (Pointed Soft-Point) were redesigned about 1990 with thinner jackets to make manufacturing easier.

Some bullet companies put hard caps over the soft nose, mostly to prevent deformation of the bullet in the magazine during recoil, the two best-known models being the Remington Bronze-Point and Winchester Silvertip. Some older hunters still believe the hard tip slows expansion, but both are basic cup-and-core bullets with pretty wide lead exposure under the caps.

Bronze-Points are still around and have long been known as quick deer killers because they expand so violently, but the Silvertip has been replaced by the Ballistic Silvertip, black-and-silver versions of Nosler Ballistic Tips. This is good, since the performance of original Silvertips varied considerably, depending on how thick Winchester made the jacket. An acquaintance in Montana has a small coffee can filled with perfectly mushroomed 130-grain Silvertip .270 bullets recovered from dead elk and other big game animals; his dad bought a pile of them decades ago, and they've been shooting them ever since. But the late Walter White, a higher-up in the Boone and Crocket Club, once shot quite a few 300-grain Silvertips from his .375 H&H into a brown bear with a skull measuring over 30 inches, and only a couple got through the bear's water-soaked hair and hide into the chest. Walter remembered refilling the magazine of his Model 70 Winchester at least twice. Luckily the bear was across a river so couldn't charge.

The first real revolution in soft-nose bullets took place in the late 1940s, when a hunter from Oregon named John Nosler had a well-regarded cup-and-core bullet from his .300 H&H come apart on the shoulder of a British Columbia moose. He started fooling around in the shop of his trucking company and came up with a two-core bullet, using a wall of jacket material between the cores to stop expansion. The first hand-made batch would just about group in a pie plate at 100 yards, but Nosler got close enough to a bull moose to put one in its shoulder. The expanded bullet penetrated the vitals, and the bull died quickly.

Even though Nosler developed his bullet because of moose hunting, he always considered it multipurpose, with the front third of the bullet disintegrating to kill deer

The Trophy Bonded bullet (left) has changed considerably since Federal took over manufacturing in the 1990s (right).

quickly, while the rear two-thirds of the bullet held together to penetrate deeply. He soon figured out how to make Partition bullets more accurate and started offering them commercially in 1948. Sales were slow at first, because Partitions were relatively expensive and because many hunters never really got the concept, including some gun writers.

Elmer Keith thought .33-caliber bullets needed to weigh at least 275 grains for use on elk-sized game, and Nosler's heaviest .33 only weighed 250. Keith went on his first safari in 1958, a decade after Partitions appeared, with a batch of thin-jacketed 300-grain bullets for his .333 OKH and wounded so many animals he ended up using solids even for animals as small as impala. With Partitions the problem might never have occurred.

The next major "premium" bullet appeared in the 1970s when Idaho hunter Bill Steigers figured out how to firmly attach a bullet's jacket to the lead core, calling his bullets Bitterroot Bonded Cores. The hunting public became aware of BBCs primarily due to the late Bob Hagel's articles and his 1978 book *Game Loads and Practical Ballistics for the American Hunter*, but Steigers managed to keep his method a secret for many years, believing nobody else would figure it out. Some speculated he used a special kind of epoxy, but the truth was simpler: Steigers heated the bullets enough for the core to melt slightly and essentially solder itself to the jacket, resulting in a bullet retaining 85 to 90 percent of its original weight. (Today some bonded bullets are made by electroplating, such as the Speer DeepCurl, but the result is the same.)

In the 1980s several new bullet designs appeared, and three were truly ground-breaking. One was

Berger thoroughly field-tested its VLD on big game before offering it as a hunting bullet. Walt Berger used a 115-grain VLD from his .257 Roberts to take this huge New Zealand red stag at 200 yards.

Jack Carter's Trophy Bonded Bear Claw. Instead of a partition in the jacket, the entire rear of the bullet was solid copper, with a bonded lead core inside the front end. Solid-shank bullets had been made before, including one model by noted gunsmith P.O. Ackley and an early Nosler bullet called the Zipedo, but both failed in the marketplace. Carter's bullet didn't, proving excellent on heavy game from elk to Cape buffalo, the soft lead core creating a wide mushroom while the bullet penetrated deeply.

Another was the Nosler Ballistic Tip, with a very pointed plastic tip. Superficially it resembled the Bronze-Point and Silvertip, but it used the very thick jacket of Nosler's cup-and-core Solid Base bullet but with a boat-tailed base. The sharp plastic tip and boat-tail resulted in high ballistic coefficients, and they

shot flatter than most other hunting bullets of the day.

By manipulating core hardness and jacket thickness, Ballistic Tips could be made to expand in very different ways. The original lineup included both varmint and deer bullets, but in the early 1990s, a very heavy-jacketed .338 appeared for use on larger game. Today heavy-jacket models are made in both 7mm and .30 caliber as well.

In the late 1980s, a hunter and saddle-maker from Utah, Randy Brooks, started making a bullet somewhat resembling the Trophy Bonded Bear Claw but with a hollow point instead of a lead core in the front end. The front end opened into four sharp petals rather than a round mushroom, creating an X-pattern, so Brooks named it the X-Bullet. The bullets penetrated very deeply but really fouled bores and didn't shoot accurately in some barrels. Eventually both problems were solved by cutting circumferential grooves in the shank, creating today's Triple-Shock X-Bullet. (The Nosler Zipedo also featured a grooved shank.)

All of today's other so-called "premium" hunting bullets combine at least two of the features of the Nosler Partition, Bitterroot Bonded Core, Trophy Bonded Bear Claw, Ballistic Tip and Triple-Shock X-Bullet. The first of these combinations to change the way hunters think was the Swift Scirocco, essentially a cross between the weight retention and penetration of the Bitterroot Bonded Core and the accuracy and high ballistic coefficient of the Ballistic Tip. A bit of a trend-setter, the basic ballistic characteristics of the Scirocco (now Scirocco II) can also now be found in the Hornady InterBond and Nosler AccuBond.

Nosler's Ballistic Tip is made for everything from varmints to medium game. John took this Namibian gemsbok with the 200-grain .338. The bullet broke the bull's right shoulder on a frontal angling shot, and was found under the skin of the left side of the rump.

The most recent twist in hunting bullets took place by accident. Some hunters started using Berger Very Low Drag (VLD) target bullets to shoot big game, partly because of their accuracy and very high ballistic coefficient. They discovered the Berger also performed well when it hit game, penetrating a couple of inches before starting to expand. This was interesting because all other expanding bullets, from cup-and-cores to Barnes Xs, start to expand as soon as they hit an animal's hide, the reason cup-and-core bullets sometimes separate jacket and core upon striking game.

Instead, Berger VLDs drilled an entrance hole so small it was often difficult to find, then expanded violently inside the animal's chest cavity, creating more tissue damage than any conventional hunting bullet. This delayed fragmentation resulted in quicker kills (given good shot placement) than conventional

bullets and also didn't damage meat around the entrance hole, like most expanding bullets.

Exactly why Berger VLDs expand this way is debatable, but the answer probably lies in their front end. Theoretically they're hollowpoints, but the sharp tip is completely closed. The jacket's also very thin, and the lead core stops at least .2 inch behind the closed tip, creating a pocket of air. The most accepted theory is that the long, sharp point allows the bullet to punch through hide, meat and even bone like a knitting needle, but after a couple of inches, the thin point collapses and the bullet expands. Expansion is often so violent, there's nothing left but small pieces of lead core and thin jacket, the reason for the massive internal damage.

This is all contrary to the mantra of increased weight retention hunters have heard since the invention of the Nosler Partition. In fact, we've become so indoctrinated, many believe the more weight a bullet retains the quicker it kills. In reality, the opposite is true, because bullets retaining all their weight don't do *any* collateral damage due to pieces flying off at angles to the primary wound. John Nosler knew this, which is the reason he designed the Partition with a softer front core, and some of the newer "coreless" bullets that appeared after the success of the Barnes X are designed for their petals to fly off. The Cutting Edge Raptor and the South African GS Custom both work this way, and they kill very well, since they're essentially monolithic versions of the Partition.

Berger VLDs do not penetrate as deeply as the Partition and Barnes X, or any other "premium" bullet, but if placed in the chest they always get inside before starting to expand. Some other target bullets act similarly to the Bergers, though they haven't been thoroughly field-tested in the way Berger tested its bullets before promoting the Hunting VLD line.

One of the interesting things about the bullets that changed the way we think is how many are constantly tweaked. In the quarter-century since Randy Brooks made the first X-Bullet, his bullets have changed radically. The grooves in the shank solved the fouling and accuracy problems, and the Tipped TSX line resulted in a higher ballistic coefficient, plus more reliable expansion at long range due to a larger hollow point under the tip.

The Swift Scirocco was designed primarily as a long-range bullet, since the company already made its heavy-game A-Frame, essentially a Nosler Partition with the front core bonded to the jacket. The Scirocco was an immediate success, since it shot both accurately and flatly, but after a couple years of field results Swift tweaked the expansion characteristics – and the Scirocco II worked even better.

Federal acquired Jack Carter's Trophy Bonded Bear Claw in the 1990s and started tweaking it, at first to make manufacturing easier, then to make the bullet more modern. Today's Tipped Trophy Bonded has a plastic tip and grooved shank, plus nickel plating to reduce bore fouling.

Even the Nosler Partition has changed considerably since 1948. Most of the heavy, large-caliber models have the partition moved farther forward so the bullets retain more weight than smaller models typically used on smaller animals. I've recovered some of these new-generation bullets in 9.3mm, .375 and .416, and the retained weight has averaged 87 percent, about like most bonded-core bullets.

All these bullets were developed not by major ammunition companies but by individuals who simply wanted something better. Today many ammunition companies have their own lines of premium bullets, but all are derivatives of bullets invented by John Nosler, Bill Steigers, Jack Carter and Randy Brooks. Perhaps in the future we'll see some other breakthrough in bullet design, and present designs will be tweaked, but it's hard to find fault with the selection of hunting bullets we have today.