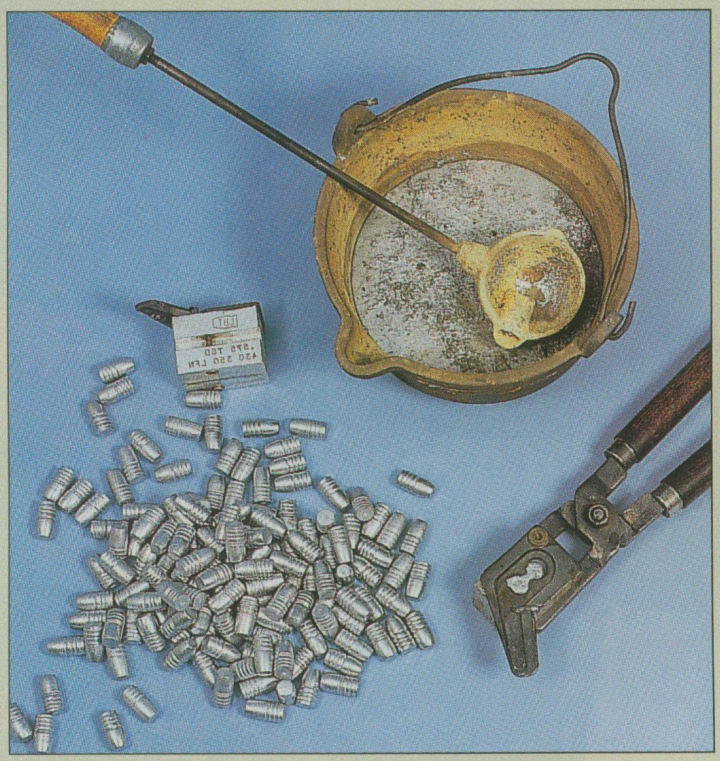
ULTIMATE CAST HANDGUN BULLETS

If you're a handgun hunter, no matter what caliber you shoot, these hot new designs won't let you down.

By Ross Seyfried

Some months ago I acknowledged that jacketed handgun bullets had begun to be able to play on the field with cast bullets. However, in terms of *performance* handgun bullets, the cast bullet is still king. The cast bullets are much more versatile than jacketed ones. They give better results, both in the air and when they hit. They also cost less! Here we are going to explore the latest cast bullet technology, focusing on bullet designs and weights that will give you maximum performance out of your favorite handgun.

As I stated when I wrote about jacketed bullets, it is generally a mistake to ask handgun bullets to expand. They kill because of the action of a flat on their noses. An unexpanding flatnose bullet will, overall, be more effective than almost any expanding one. The one exception may be the cast softnose that acts like a Nosler Partition rifle bullet (see *Guns & Ammo,* June 1989). On game under 200 pounds they can be spectacular. The very worst kind of handgun bullet, jacketed or cast, short of one that blows up, is a round or pointed nose. They can and often will fail miserably. Last winter I failed to heed my own advice and nearly paid a very high price.



The author's extensive field experience has proven to him that the finest bullets for handgun hunting are cast lead designs from Lead Bullet Technology. The LBT bullets feature broad flat noses, or meplats, that deliver potent energy transfer and penetration on target—no matter how big or small.

I was on my annual hunt for a big whitetail buck. I was carrying a .500 Purdey pinfire double rifle. It uses a 400-grain, .512-inch bullet at 1,200 fps—a "handgun" by any other name. I wanted to use a traditional bullet in this vintage rifle and chose a semi-pointed roundnose, reasoning that the .50 caliber would easily make up for the incorrect shape. The bullet was cast 1 to 30 tin/lead, as soft as the rifle would handle accurately.

The old buck stopped 90 yards away, facing three-quarters toward me. At the hammer fall he reacted in leaping-marlin fashion, the sign of a sure and deadly hit. My only concern was that he looked extremely strong as he raced away, visible for the first 100 yards. I felt he should have fallen in 50. But not to worry—there was a foot of snow on the ground. I waited 30 minutes before I walked to where he was standing when the bullet hit him. There I saw clipped hair in the prints of his front feet and a tuft of hair and fat lying in the snow some 10 feet away, on the far side. All was well; I would find a blood trail a blind man could follow in about 20 yards.

Three hundred yards later I was tracking with all of my skill. His prints were mingled with those of dozens of other deer. The only indication of my prize was that about every third bound his frontprints looked unsteady. Not a single speck of blood had appeared on the snow. My mind was reeling. I couldn't imagine what had gone wrong. I wasn't even sure the tracks were right, but I followed the occasional misstep almost by instinct. All I knew for certain was that I had put 400 grains of .50-caliber lead through one of the best bucks I had ever seen, and I couldn't prove it.

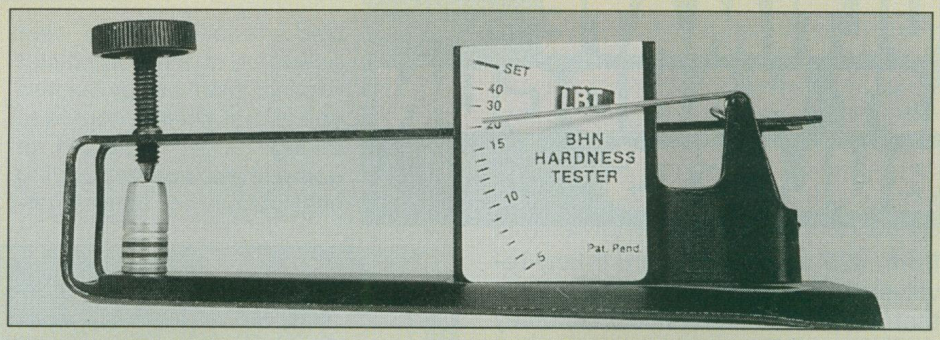
The trail led toward a willow jungle, the place where a giant would go to hide. But just before he entered it, the trail took a sharp turn to the left toward the river and my confidence soared. He would not have turned away from this sanctuary unless his brain was failing. For the first time in what had seemed

COLOR PHOTOGRAPHY BY THE AUTHOR

hours of tracking I allowed my eyes to leave the trail and scout ahead. There, 20 yards away, was a beam as thick as my wrist above a snow drift. My hit was perfect, centering his left shoulder and exiting just behind his last rib on the right side. The pointed bullet had left pinpoint entrance and exit holes. I cannot explain why he had not left a blood trail from his nose and mouth, for both lungs had suffered massive trauma and were full of blood. All I know is that it happened and I have learned my lesson. When I launch a bullet at less than 2,000 fps, it will be a round ball or have a *big* flat on the nose!

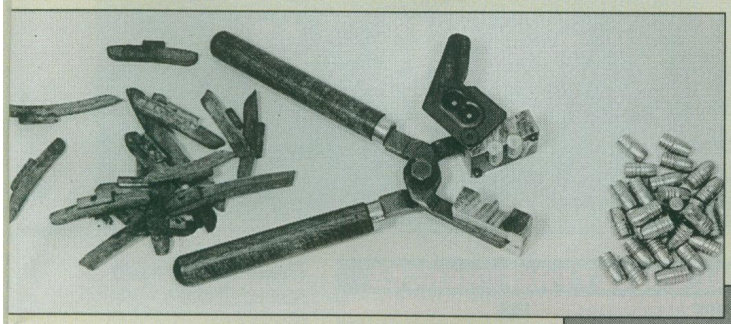
I've stolen a bit of your time to tell you this story with a happy ending in spite of, not because of, the bullet I chose. It sets the stage for all that is to follow. With handgun bullets it's "what's up front that counts." No amount of trickery can overrule the fundamentals of good bullet design. Elmer Keith put us well on the path, and an as yet unsung hero named Veral Smith has brought us home.

As we proceed you will note that much of what I have to say revolves around Mr. Smith and his company, LBT (Lead Bullet Technology). This certainly isn't because of some conspiracy to cut others out of the picture. Rather it is because at the moment LBT is about the only game in town. So far, to my knowledge, no other company has had the insight to offer molds using the LBT bullet designs. I hope that will change in the future. Also, the mold-making service offered by LBT will turn out virtually any shape, weight or diameter your heart or sixgun could desire. They also offer exceptional lubricants, hardness testers and the most complete cast bullet book ever written. This is a rare link with the grand old days when a shooter could get what he wanted. I have found three firms that offer finished cast bullets in the LBT shapes. While two have a very limited selection, Beartooth Bullets will sell you any bullet that is available from LBT. They also have a small book that will reveal a great deal of first-hand knowledge about lead bullet shooting.



After bullets have been cast from wheelweights, simply dropping them from the mold into a bucket of cold water produces hardening to a level of Brinnell 22, as evidenced on the LBT hardness gauge. A bullet this hard is perfect for even the toughest game animal.

At left is the bullet used by the author to take the buck described in the story. Its pointed shape failed to perform, but if the flatnose LBT design at right had been used, the outcome would have been much more certain.



Ordinary wheelweights, used in balancing automobile tires, can be turned into the very finest cast handgun bullets and they are also the least expensive casting material.

While there may be viable arguments for the jacketed bullet, against the cast, in terms of accuracy or impact, when we talk about versatility the cast bullet stands alone. With the cast bullet we have almost total control over: weight, hardness, diameter and performance. Because there are so many variables, let's single out the .44 Magnum and see what we can do for it with the versatility of cast bullets.

Looking at weight, I currently have molds that range from 180 grains to 390 grains. Admittedly both extremes are almost equally useless, but the choice is there if you want it. In addition to the different molds, I can alter the weight of the bullets from any individual mold about 10 percent by changing bullet metals from wheelweights to linotype. The lino makes a much lighter bullet due to its very high antimony content.

Because we can "size" the bullets ourselves we can also have a choice of diameters. Where the jacketed bullets are usually limited to .429 to .430 inch, we can size the cast bullets anywhere

This lineup shows just some of the potential cast bullets available in .44 caliber. They cover the spectrum from the original Keith design at far left, to the big 390-grain LBT at right.

Three .44 LBT bullets offer different weights and shapes, which translate into different velocity and penetration potential.

ULTIMATE CAST HANDGUN BULLETS

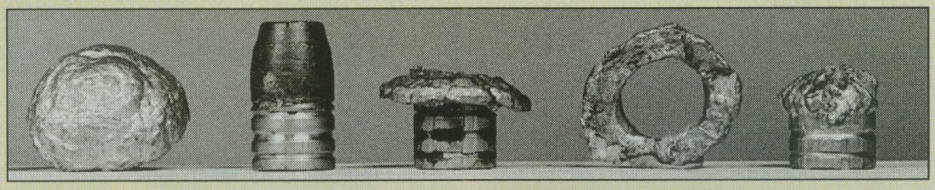
ized softnosed bullets, cast bullets will do their job without expanding. What may surprise you is that when it comes to taking game, all sizes of game, these non-expanding cast bullets are almost certainly more effective than their "expanding" jacketed counterparts.

As we begin to design a handgun bullet there are three major factors that govern its terminal performance: weight, velocity and the diameter of the meplat (flat on its nose). They are all interrelated when we consider total performance. Like shifting gears in the transmission on a truck to alter speed and power, shifting weight, meplat and velocity gives us a scale of wound channel and penetration to match our game. Also, with some of the most advanced bullet designs it is possible to drive more weight or achieve higher velocities at standard pressures. Some bullets actually make our guns "bigger."

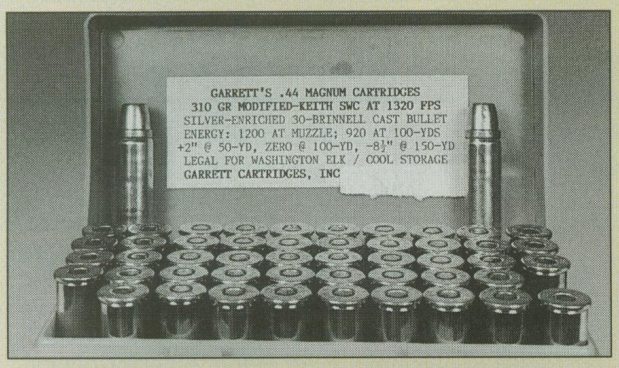
Before we launch ourselves into the actual shapes that have changed the face of handgun performance, mostly with the shape of their noses, let's look at the bullet bases. At the back end of a cast bullet we have two choices, to gas check or not to gas check. Our old friend Elmer Keith opined that gas checks were worse than .429 up to .432 inch. (Many revolvers have bores and cylinder throats that will produce their finest accuracy with the larger diameters.)

By changing bullet metals, or the treatment of those metals, we have almost total control over bullet hardness. We can make bullets (or parts of bullets where softnose designs are concerned) out of anything from pure lead to linotype. The pure lead is nearly as soft as bubble gum and while it is not very useful for the bullet body, by making the nose out of it we can have bullets that will expand at the lowest velocities of any handgun bullet. On the other extreme linotype has a Brinnell hardness number (BHN) of about 22. It is hard and tough enough to break the bones on a Cape buffalo. However, the least expensive and most versatile bullet metal is the humble wheelweight. As cast it is moderately hard, about 15 BHN, but can be heat-treated to 30 BHN. The easiest way to make a very hard bullet is to simply drop the wheelweight bullets out of the mold into a 5-gallon bucket of cold water. The results are bullets that average about 22-25 BHN...metal that will stand up to almost anything except railroad iron. For those of us who count our pennies and not our time, a hundred 250-grain .44 Magnum bullets have about 25 *cents* worth of wheelweights in them!

With the basic physical properties at our disposal, we begin the voyage into bullet design. This is the factor that has truly brought the modern cast handgun bullet to its highest performance level in history. With the exception of the special-

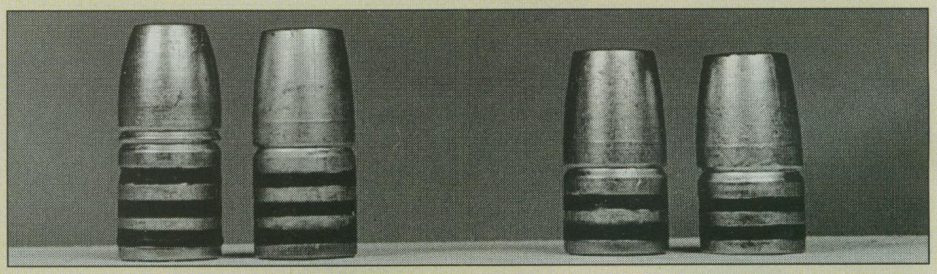


The bullet caster can also make custom softnose bullets using pure lead noses and hardened bodies. These offer extreme expansion for game under 200 pounds in weight, and they perform much like the Nosler Partition.



Garrett Cartridges is one of the few companies to offer custom factory-loaded ammo using heavy cast lead bullets. The .44 Magnum offering shown here uses a 310-grain Keith-style hard-cast bullet at 1,320 fps.

The author prefers Hornady gas checks, and he heats them on a stovetop to anneal them. This softens them, making it easier to mount them on the base of the bullets.



These bullets were tested at the Hodgdon laboratory for pressure and velocity differences. The pair at left are 350-grain LFN and WLN designs, while the pair at right are both WLN shapes, with and without gas checks.

AUTHOR'S PERSONAL BULLET PREFERENCES

CALIBER	WEIGHT (grs.)/TYPE	USE
.32 Mag	120 LFN	Varmints/turkeys
.38/.357	180 LFN	Varmints/turkeys
.38/.357	180 WFN	Small deer
.41 Mag	220 WFN	Small deer
.41 Mag	250 LFN	Large deer, black bear
.44 Mag	280 WFN	Deer, other game to 300 pounds
.44 Mag	300-325 WFN	Game to 800 pounds
.44 Mag	350 LFN	Game to 1,000 pounds, larger game with extreme care
.45 Colt/.454	325 WFN	Any game up to 500 pounds
.45 Colt/.454	360 LFN/WFN	Elk and other game to 1,000 pounds
.45 Colt/.454	400 WLN	Buffalo, brown bear, etc.
.475	430 LFN	Game over 1,000 pounds
.475	385 WFN	Deer, black bear, other game under 1,000 pounds
.500	450 LFN	Game over 1,000 pounds
.500	400 LFN	All lesser game

than useless, offering nothing positive in the way of performance while raising pressures. In this rare instance Elmer only *thought* he knew, rather than *knew,* the answer.

I am not a great disciple of gas checks and I am lazy, so I tend to lean away from them, but recently I had two identical 305-grain, .44-caliber bullet molds cut. One was plainbase and the other gas-checked. I loaded them on 21.9 grains of H-110 and sent them to the Hodgdon Laboratory for pressure and velocity testing. The plainbased bullets averaged 5,000 psi or about 13 percent more pressure than the gas-checked ones, while gaining only 37 fps or 2.6 percent more velocity. At the same time, the standard deviation of the plainbased loads was more than double that of the gas-checked ones. Where accuracy is concerned I have fired loads with both plainbase and gas checks that were extremely accurate and ones that behaved like shotguns. However, in general, a gas-checked bullet is more apt to shoot accurately than a plainbased one. That is, the gas-check bullets are more forgiving. They work well with softer metals, less efficient lubricants or higher temperatures. I won't say you can't have a great load without gas checks, they just increase your odds. The gas check is especially advantageous in very hot weather. If the thermometer gets over 90 degrees, a check will become a great friend. Actually about the only real negative about a check is the hassle of putting it on. I even tried shooting gas-checked designs without checks. This was a failure. The accuracy was usually terrible. When I recovered the bullets, I was amazed to see that they had traveled down the bore with the base grossly off center, with most of the rifling impression on one side of the bullet. I couldn't imagine that the short, unsupported shank made that much difference, but when I put checks on the same bullets they became very accurate, and recovered bullets were perfectly centered. If you have a checked design I highly recommend that you put checks on them.

One trick I have discovered that makes them easier to put on and more accurate is to anneal the checks before application. I put a hundred or so in a metal ash tray (a 2-inch black iron pipe cap will work perfectly...don't used galvanized ones due to danger of the burning galvanizing producing toxic fumes). Then I heat the lot on the kitchen stove until the checks turn from their original color to the greenish red that you see on the necks of military cases. After cooling they will be dead soft. This makes them grip the bullet bases more uniformly, because they don't spring back after sizing.

It isn't possible to discuss handgun bullets without mentioning the Keith design. These are the classic semi-wadcutters that we have all grown up with. By adding weight to Elmer's original 250-grain .44 and .45-caliber bullets, it is possible to enhance their performance some, but they still remain limited compared to the new LBT designs. The one source of high-performance, cast bullet ammunition that I know of is Garrett Cartridges. They load a heavy, 310-grain Keith bullet at maximum velocity in the .44 Magnum. The Keith bullet is wonderful and the new bullets are better, in part due to a variety of performance that can be had by "gear shifting" with three basic LBT designs.

The LBT designs are all variations on the same theme. That is, they have truncated-radius noses...pointed roundnose bullets with the point chopped off to make them flat. They do not have sharp

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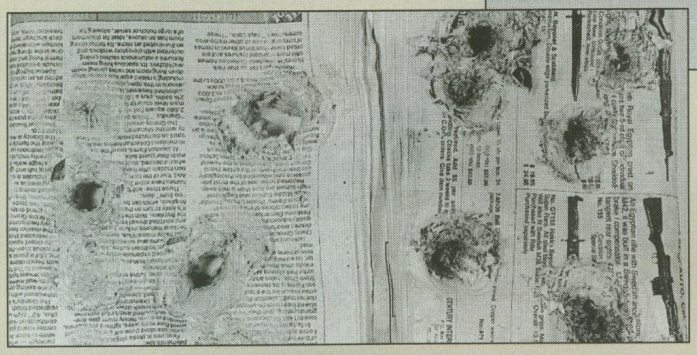
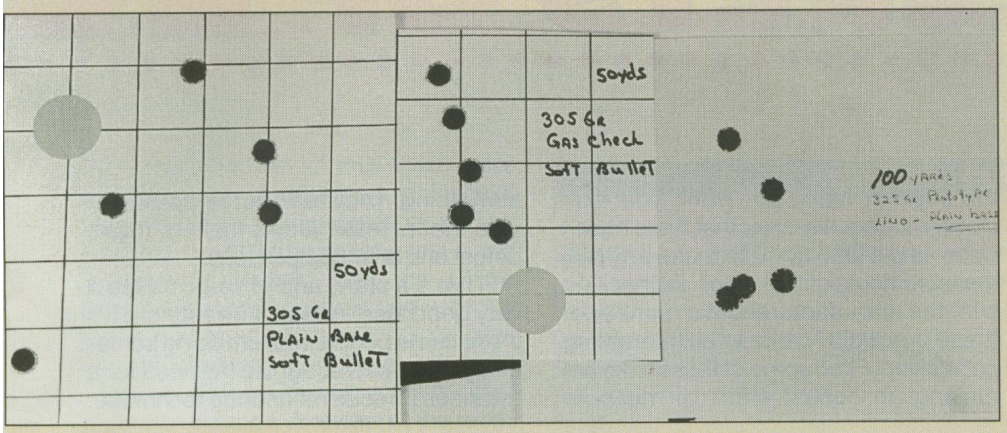


Penetration tests run in saturated newsprint showed the author that even the lighter and expanded 280-grain LBT bullet at left penetrated deeper than the heavier 320-grain JDJ design at right. The bullet in the center was the best of all, a 350-grain LBT that drove straight and true through 43 inches of the tough medium.

RESULTS OF PRESSURE/VELOCITY TEST .44 MAGNUM

BULLET	CHARGE	PRESSURE (cup)	VELOCITY (fps)
305-gr. WLN gas check	21.9 gr. H-110	33,300	1,383
305-gr. WLN plain base	21.9 gr. H-110	38,200	1,346
350-gr. gas check LFN	19.0 gr. H-110	39,400	1,230
350-gr. gas check WLN	19.0 gr. H-110	35,900	1,220

NOTE: Pressure data courtesy of Hodgdon Laboratory. All loads in Federal cases, with CCI #350 primers. Hornady gas checks. WLN = Wide Long Nose bullet design, LFN = Long Flat Nose bullet design.



The left and center targets show that on average, accuracy potential is increased when gas checks are used. These groups were fired with bullets of the same design, except one had a gas-check base and the other was plainbase. However, the target at right was produced with an experimental plainbase design of the author's, showing that gas checks are not mandatory for accuracy.

MAXIMUM USABLE BULLET WEIGHTS

CALIBER	WEIGHT (grs.)
.32	120
.357	200
.41	275
.44	350
.45	415
.475	430
.500	450

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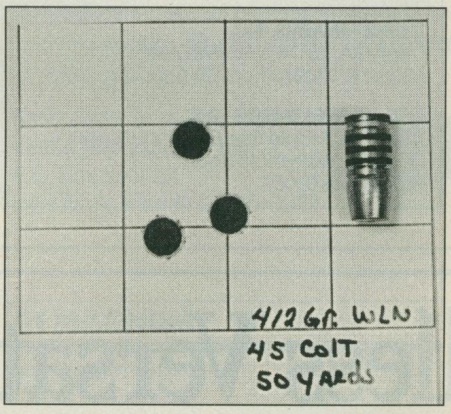
shoulders like the Keith bullet, in essence filling the air space between the Keith shoulder and nose with meaningful lead. The major variable in the LBT shapes is the diameter of the meplat in relationship to the diameter of the bullet. The smallest nose diameter in any given caliber is the Long Flat Nose (LFN). The diameter of its meplat is .130 inch less than the bullet's diameter, or .300 inch in .44 caliber (the famous Keith .44 has only a .270-inch meplat to work with). The next is the Wide Flat Nose (WFN) with a meplat .090 inch less than bullet diameter, or .340 inch in .44. This same relationship is used from .32 to .50 caliber.

Finally there is the Wide Long Nose (WLN), which utilizes the meplat diameter of the WFN, with the nose length of



LBT's 412-grain .45-caliber bullet is an extremely accurate "slugger" useful on the heaviest game animals.

the LFN. Its purpose is purely for ballistic performance; that is, getting a maximum amount of lead outside of the case with a usable, accurate nose shape. These are intended for maximum weight/velocity ratios in any given caliber and are most useful when you want to use very, to extremely, heavy bullets. Three-hundred-fifty-grain .44s and 400-grain .45s are two wonderful WLN bullets (if you are hunting iron-plated monsters or enjoy recoil). I can launch a 412-grain WFN out of my five-shot .45 Colts or .454 Casulls in excess of 1,300 fps at normal pressure. This bullet allows the .45s to rub shoulders with the great .475s, making the .45 easily the most versatile handgun caliber of all time.

The LBT bullet weights are controlled by the length of the shank. The 210 or 350-grain LFN .44s for example have identical noses but different shank lengths.

The new bullets have superseded the Keith designs for two basic reasons: greater meplat diameters and less bullet inside the case for given weight. The designs offer higher velocity potential and more frontal area to do the work. To best understand this it is important to grasp the most basic function of a handgun bullet when it comes to taking game. That is, that the flat part on the nose or meplat does *all of the work.* The shoulder of a Keith bullet is flying in the vacuum left by the nose. It cuts a paper target but doesn't chew on our buck. The "killing" power of a handgun bullet is governed to a great degree by its meplat diameter and enhanced by velocity. That is, the larger the meplat or the higher the velocity, the greater the "splash" when they hit. Take a big flat and drive it relatively fast and you get a tremendous punch when it hits. Keep in mind that the area of a circle increases with the square of its radius. It is much easier to double the area of the meplat than to double the velocity. Mix in the momentum as it relates to the weight, or sectional density, of the bullet and it causes penetration.

With a lot of boring technicalities behind us, let's look at some real bullets and guns to see how I use the bullet designs. Looking at the .44 again, my favorite bullet for deer and other medium-sized critters is a 280-grain WFN. Certainly heavier bullets and/or smaller meplats (LFN) will take deer cleanly, but the high velocity and large meplat of the relatively light 280-grainer will create more damage to a deer.

For elk I would probably choose a 325-grain bullet with a smaller meplat and less velocity, but with greater penetration, because the 280 WFN above might fail to get deep enough on a raking shot on a beast that might weigh 800 pounds or more. For Cape buffalo I would step all the way up to 350 grains, with even less velocity but maximum penetration capability. Of course I wouldn't consider buffalo with the .44 when I have .45s or .475s. With the .45 I can go back to the larger meplat, but with much more weight to regain the penetration potential. At the same time I chop a larger hole through the brute, making the project much more realistic. The .475 with a 430 LFN is the king of buffalo guns, but becomes unnecessarily difficult to manage for deer hunting. Swapping the 430 LFN for a 390-grain WFN would make the .475 a real deer crusher, even at reduced, 1,100-fps velocity.

Admittedly with all of the choices it gets a bit complicated, so I've offered a table showing the bullets I would choose for various animals as well as what I feel are the maximum usable bullet weights per caliber. The criteria for the choices are: an exit hole *every* time, maximum wound diameter and ease of making the hit. Keep in mind that while a deer bullet of the LBT design might fail on a Cape buffalo, the buffalo bullet

will work on all lesser beasts. It might be a bit less spectacular, and more difficult to apply, but if planted in the right place there will be no survivors.

As always, you can and should test your loads against wet paper. For total realism you add a bone, equivalent to the largest ones on your intended game. Sandwich it about 3 inches from the front of your stack of wet paper. Keep in mind it will take 4 feet or more to stop the big handgun loads. The wet paper your bullet penetrates will equate almost perfectly with solid muscle. It also gives you a good look at the wound diameters with different nose shapes and calibers.

Recently while trying out the new WLN shape, I shot some other bullets as comparators. Some of the results are quite revealing. For example, I shot some .44-caliber 280-grain WFNs at very high velocity out of my Super Redhawk. My first batch of bullets were wheelweights as cast (not hardened). They impacted so violently that they actually expanded a bit and limited penetration to 20 inches. After hardening they would penetrate 30 inches but leave a wound channel nearly as large as the expanding ones, especially after the first few inches. The humble 250-grain Keith would go 32 inches deep, but with a much smaller cavity. I tried what should have been the ultimate penetrator, 330 grains in J.D. Jones' truncated cone design. They proved to be an utter failure, never reaching 22 inches in the same medium. The too-pointed bullets simply turned sideways after a few inches, lying down on the job and dying.

"...if I am in doubt I use a little more weight and a larger meplat."

Aha, you say, the bullets were just too long to be properly stabilized by the twist. I also thought this was a possibility, so I fired a 350-grain LFN from LBT...an even longer bullet that should require more twist to stabilize it. Wrong! These drove a string-straight path 43 inches deep! They stopped nose-forward, dying with their boots on. The Jones bullets failed due to incorrect nose design, or more accurately the LBTs triumphed because of design perfection.

After firing the .44 bullets I shot some similar .45s, examining the wound channels made by the .021-inch-larger meplats. The .45 makes a much larger hole in the paper, just as it does in critters. This basically explains why the .45 is visibly so much more effective on game.

With all of this you can see we have drawn open the curtain. We are no longer stuck with a 250-grain semi-wadcutter bullet. With the basic LBT designs you can choose from a broad spectrum of performance qualities, ranging from relatively light, fast bullets to great long sluggers with immense penetration. Possibly the best news of all is that, within reason, it is very difficult to make a bad choice. The design is so forgiving that the "worst" LBT .44 bullet is probably better than almost anything else we could fire out of the same cartridge. In my hunting, if I am in doubt I use a little more weight and a larger meplat. They haven't let me down yet...and I don't expect they will.

DIRECTORY

BEARTOOTH BULLETS
(hand-cast and heat-treated 21 BHN hardened bullets, all LBT designs in any caliber; custom orders welcomed; send SASE for list)
Dept. GA, Box 491
Dover, ID 83825

BLACK DIAMOND BULLETS
(.475 LBT 430-gr. and 320-gr. Keith .45)
Dept. GA, Box 551
Pearce, AZ 35625

LBT
(bullet molds, hardness tester, lubricant, book; catalog $2)
Dept. GA, HCR 62, Box 145
Moyie Springs, ID 83845

LYMAN PRODUCTS
(casting supplies)
Dept. GA, Route 147
Middlefield, CT 06455

MKL SERVICE CO.
(reboring your RCBS, SAECO or Lyman sizer/lubricator dies in .001-in. increments .223-.560 in.)
Dept. GA, 610 S. Troy St.
P.O. Box D
Royal Oak, MI 48068

MOUNT BALDY BULLETS
(limited LBT designs in .41, .44, .45, .475 and .500)
Dept. GA, HC 87, Box 10A
Keystone, SD 57751

NEI HANDTOOLS
(the old NEI is back in business, specializing in molds for rifle bullets at the moment; they will make some handgun bullet molds and custom designs; send SASE for list 51583)
Dept. GA, Columbia River Highway
Scappoose, OR 97056

RCBS
(bullet casting, custom sizing dies)
Dept. GA, 605 Oro Dam Blvd.
Oroville, CA 96965

STAR MACHINE WORKS
(sizer/lubricators; send stamped envelope for brochure)
Dept. GA, 418 Tenth Ave.
San Diego, CA 92101

ROBERT STILWELL
(custom dies for Star Lubrisizer .257-.530 in.; send stamped envelope for brochure)
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Schertz, TX 78154