

# A New High-Power Cartridge

By HORACE KEPHART

## The Last Word on the Cartridge for the Bolt-Action .250-3000 Savage

AS Editor of the Gun Department of this magazine I get many inquiries about the best rifle for this or that purpose. It is remarkable how many letters ask whether such or such a weapon is "good for moose and grizzly bears." Sometimes I get to dreaming that there must be a lot of moose and grizzlies rampaging through Potter County, Pennsylvania, and around the head springs of Schoharie Creek, New York.

For once let a gun editor turn and ask a couple of questions himself.—

(1). A big dray horse fell in the street and was so hopelessly crippled that he had to be killed on the spot. A policeman drew his pocket revolver and shot the animal through the forehead. He knew enough to shoot high up, instead of between the eyes. The horse quivered, and was dead. (Now get out your gun catalogues.) A .32 caliber bullet, 98 grains of soft lead, muzzle energy 109 foot-pounds, penetration 4 inches in soft pine, did the work as quickly and surely as a cannon. The horse weighed twice as much as a bull moose, three times as much as the biggest grizzly in the Rocky Mountains. And, whether you believe it or not, he had as much vitality as either of them.

**Question:** Is a .32 Colt police revolver powerful enough for moose and grizzlies?

(2). A gray squirrel jumped just as a hunter drew trigger. It got shot through the belly by a .38-55 bullet weighing 255 grains, muzzle energy 988 foot-pounds, penetration 9 inches in pine. The squirrel fell to the ground, popped into a hollow tree, caught its intestine on a sliver, unreeled it in running up out of reach, and clung there till it bled to death.

**Question:** Is a .38-55 too small to hunt squirrels with?

(Please observe that this is a technical discussion. If it sounds "bluddy" you need not infer that the writer is bloody-minded.)

As the year's hunting season is still far away (I am writing in May) there has been no chance to try my .250-3000 Savage, model 1920, on game. Still one can judge fairly well from experiments on inanimate objects what the limitations of such an arm are, provided he has had a good deal of experience in compar-

ing such tests with actual hunting results in the case of many other rifles. I have.

First let us understand clearly that what we call "killing power" is made up of several factors: (1) energy of impact, (2) shock, (3) penetration, (4) blood-letting.

The energy of a cartridge can be expressed exactly in foot-pounds. Square the velocity, multiply this by the bullet's weight in grains, and then by the decimal .000002222. Energy of impact means simply how hard a blow the bullet strikes, at a given distance.

Shock is a different thing. It is the stunning effect on the animal itself. It depends not merely on energy but on the part struck and the amount of tissue pulped. A pebble striking your eyeball would knock you out, whereas a bullet through the calf of your leg would only get your dander up.

Other things being equal, the larger the bullet the greater its killing power.

Other things being equal, the faster the bullet flies the greater its killing power (but with reservations).

A small bullet going at high speed may have as great energy as a large bullet at low speed. Whether or not it has much killing power depends on several factors, one of which is penetration and another is expansion. A third factor is hydrostatic pressure. All flesh except fat is juicy—contains fluid. Viscera contain much fluid. A bullet traveling at very high speed and striking such material sets up a violent bunting effect in all directions around its path, due to the suddenly displaced fluid being driven away from the bullet at such velocity that the tissues have no time to stretch or "give." The fluid itself is incompressible.

Now let us consider the penetration of the .250-3000 soft-point bullet.

On my shooting ground there was half of an old school-house bell. A .250 bullet with naked lead point was fired at the bell and struck it where the metal was  $\frac{3}{8}$  inch thick. It went through and broke the big piece of bronze in two. The hole of entrance was  $\frac{3}{8}$  inch wide and  $\frac{1}{2}$  inch long. The hole of exit was funnel-shaped,  $1\frac{1}{4}$  inches in outside diameter, the tough metal being jerked out, as it were, by the roots.

A soft-point bullet at high speed penetrates as deeply in iron or steel as a full-jacket bullet from the same gun, but it makes a larger hole. This is analogous to shooting a piece of tallow candle through an inch plank, which I have done with a smooth-bore horse pistol. Speed does it.

A soft-point bullet from the .250-3000 Savage rifle shoots through as much tough steel plate (very nearly  $\frac{1}{2}$  inch) as the 150-grain full-jacket Springfield, at short range. On the same plate a .30-30 bullet will scarcely make a perceptible dent. Yet the .250 bullet weight only 87 grains.

The soft-point bullet will not glance. It would smash to flinders the thigh bone of an ox or a grizzly bear, if the bone were exposed. But note that *if*. Let us not draw hasty conclusions.

I fired a soft-point from the model 1920 Savage through the center of a 6-inch black pine tree (pitch pine). It splintered and tore the far side of the tree as if a young bomb had landed there.

Then I fired along one side of the tree to test deflection. The bullet smashed a straight course through the 3 inches of wood that it encountered, and went on—what was left of it. Three feet beyond the tree stood a seedling of the same species, only  $1\frac{1}{2}$  inch thick, directly in the line of fire. The copper jacket of the bullet, all crumpled up and clean of lead, lodged in this treelet, going only half-way through.

I set up a series of 1-inch seasoned chestnut planks, close together. Soft-point bullets from the .250 went through ten to eleven boards. The hole of entrance on the first board showed that the bullet mushroomed on contact. The other holes were progressively larger. The bullets blew to pieces somewhere along their course through the boards.

Then I set up five of these planks as before, and four feet beyond them, in line of fire, I set up the others. Soft-point bullets, after passing through the first five boards, jumped the interval (or their fragments did), penetrated the sixth board, and left only slight marks in the seventh. One bullet made two holes through the sixth board.

The explanation is obvious. In

shooting through boards or small trees, with a soft-point bullet going at the rate of 3000 feet a second, the last few inches of wood are not penetrated by a thing we would call a bullet. They are torn asunder by mere fragments of lead and copper, like a sand-blast, if you can imagine a sand-blast working at such high velocity.

Or you may liken it to a charge of fine shot fired at a plank near the gun's muzzle, and going through as if they were one solid ball. So long as the pellets stay close together each of them helps the other to tear its way through. But at a longer

greater. Thus, for example, the penetration of the .250-3000 in  $\frac{7}{8}$  inch white pine boards, spaced one inch apart, is as follows.—

Velocity	Distance	Soft Point	Full Case
3000 ft. sec.	Muzzle	13	69
2015 " "	300 yds.	24	40
1507 " "	500 " "	17	25
916 " "	1000 " "	12	12

This is as good a place as any to introduce some ballistic data of this interesting cartridge. They have not been published up to the time of this writing.—

**BALLISTICS OF THE .250-3000 SAVAGE CARTRIDGE**  
Shot from 22-Inch Barrel  
Ballistic Coefficient of Bullet .27

RANGE Yards	ANGLE OF DEPARTURE Deg. Min. Sec.	TIME OF FLIGHT Seconds	REMAINING VELOCITY Ft. Sec.	TRAJECTORY MID-RANGE Inches	REMAINING ENERGY Ft. Lbs.
Muzzle			3000		1737
100	2'—1"	.1066	2643.3	.544	1349
200	4'—24"	.2281	2314.0	2.49	1034
300	7'—16"	.3666	2014.6	6.49	783
400	10'—46"	.5270	1743.7	13.33	587
500	15'—4"	.7122	1507.0	24.34	438
600	20'—23"	.9269	1303.5	41.18	328
700	26'—59"	1.1726	1150	66.15	255
800	35'—3"	1.4467	1048	101.7	212
900	44'—41"	1.743	975	150.1	183
1000	55'—54"	2.061	916	213.8	162
1100	1°—8'—40"	2.399	864	294.1	144
1200	1°—23'—0"	2.756	817	393.4	129

distance, when they have scattered, then each pellet will penetrate only as far as its own momentum will drive it. So it is with the fragments of a bullet that has virtually exploded.

This action is the same in flesh and bone as it is in wood, except that flesh "gives" more to the sidewise strain. How about hair and hide? Well, I fancy that thick hair or fur acts a good deal like cotton batting, which will deform a lead bullet more than boards do. That, however, is theory. Let us get back to observed facts.

A soft-point bullet driven at so high velocity that it "explodes" in flesh or wood can and does tear a pretty deep hole, somewhat funnel-shaped. But if this bullet should happen to hit a sapling standing in the way it would go to pieces, and the spray of its fragments would be harmless a few rods farther on.

The same kind of missile will break up into minute specks where ever it strikes earth, even at only a slight angle. This makes it safe to use in hunting woodchucks, foxes, coyotes, and other vermin that are shot on the ground.

A soft-point at low speed has no such characteristics. It merely mushrooms, and its penetration is

If you like to make comparisons, get the Winchester, Remington, and Newton catalogues, refer to their ballistic tables, and use them in connection with this one.

The .250-3000 cartridge is the most successful one on the market in getting the utmost efficiency out of a small bullet. It is the highest development of the .30-30 class, by which I mean those cartridges of about 2 $\frac{5}{8}$  inches total length, and not over .38 caliber, that are charged with high-pressure loads of powder. This class includes the .22 H.P., 25-35, Remington, .250-3000, .30-30, .30 Remington, 303 Savage, .32-40 H.P., .32 Remington, .32 Winchester special, .35 Remington, and .38-55 H.P.

It would be unfair to compare the .250-3000 with cartridges of the military class, including the Newtons, which have a length over all of 3 to 3 $\frac{5}{8}$  inches. These have more powder space, and they can use long, heavy bullets with high ballistic coefficients. They require longer breech actions and heavier rifles than the .250-3000. They are more powerful, maintain speed and energy better, kick harder, and are more likely to give trouble from metal fouling.

But in its own class—the commercial cartridges for standard rifles of short action and light weight—the .250-3000 is supreme. It has the highest velocity and lowest trajectory of them all. In the model 1920 Savage rifle it has the finest accuracy of them all. In the yards it has more energy than any of the others. It has more explosive effect than any of them.

This is an advantage in some respects, but a drawback in some. It kills medium sized animals quicker, but mangles more meat. Its penetration is not dependable in shooting heavy animals that are running away from the hunter and present only their rear for a mark.

Anyone who is a good stalker and a good shot, who can afford to take his time and pick his shots, can kill the largest American animals to a certainty with the .250-3000. Such a one will never take the chance of a rump shot, nor will he shoot at game on the run except at close quarters.

This is not saying that the .250 is a proper weapon to use on moose or Alaskan bears from choice. Decidedly it is not. A sportsman out on a short vacation may get only one chance at the noble prize he has come so far to win. He may have to shoot from any quarter, and on the run. There may be trees and bushes cutting off the view so that he does not know just what part of the animal it is that he sees.

Under such circumstances it is nonsense to talk of "putting the shot where it will do the most good." He will put it where he can. It isn't like shooting a bull in a pasture, by a deuce of a sight. Our policeman killed the big horse with his pistol when it was helpless and he could pick his shot. But suppose that horse had been a run-away.

Deer hunting is different. In regions where deer are protected throughout most of the year they multiply fast and are relatively tame. One is likely to get several chances, and fair ones at that. Great penetration is not needed. I am confident that the .250-3000 will knock out a deer nearly every time. It may fail once in a while. What gun will not? Remember our squirrel and the .38.

As for black bear, I have observed the effect of bullets from much weaker guns than the .250 on bears, and would have perfect confidence in it for anything except perhaps a rump shot. A black bear is not much harder to kill than a big ramb back hog, and it is not a bit more dangerous.

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