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BIG BORE RIFLES

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GUNS & AMMO ACTION SERIES #1

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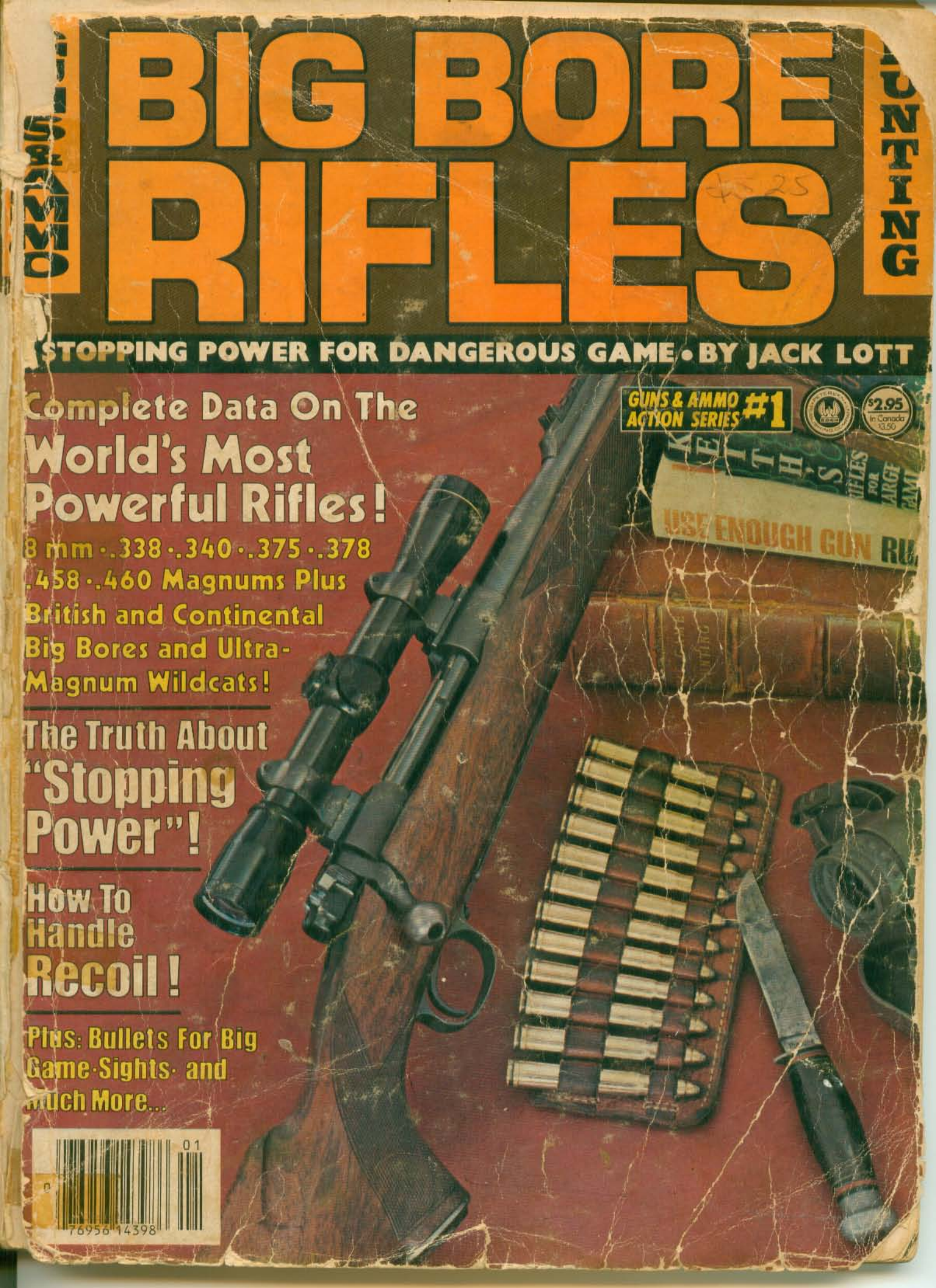

BIG BORE RIFLES

By Jack Lott

This book is about big bore rifles, the "supers" once the special ordnance of wealthy sportsmen and professional hunters. Back in 1937, when Winchester introduced the Model 70 and included the .375 H&H Magnum chambering, the previous U.S. view of the .30-06 as a "big bore" was made obsolete. Since then the popular demand for magnum calibers of over .308-inch and from 4,000 foot pounds to over 5,000 foot pounds of energy has been astonishing. This demand has led to the big factories producing as standard (or a bit more costly) models .375 Magnums, .338 Magnums, .458 Magnums, and now the potent new 8 mm Remington Magnum. Weatherby has long ceased to be known solely for its original stellar attraction, the .300 Weatherby Magnum, and produces a healthy annual cash crop of .340s, .378s and their "mega-magnum," the .460.

What is certain is that, despite the fact that most hunters in the United States are better served by rifles of lesser power from .270 to .30-06, bore size when coupled with high energy has a powerful psychological appeal. This is in addition to the fact that big bores serve a function—to provide that extra dosage of power commensurate with the greater size of the largest game and also for the stopping of charging dangerous game. We do not dispute the fact that smaller conventional calibers have all performed such work with suitable bullets at times for exceptional hunters in spite of the inherent power deficiencies. However, this book explores the big bores, those over .308-caliber powerhouses with energies of some 4,000 foot pounds on up. If you really need such power, you are in the minority, but regardless, much interest and mythology surrounds the magic term "big bore." And if you want one, that's plenty of reason to own one! It is my hope that after reading this book you will have a better conception of what today's big bores are and are not, and how they perform—sometimes indispensably.

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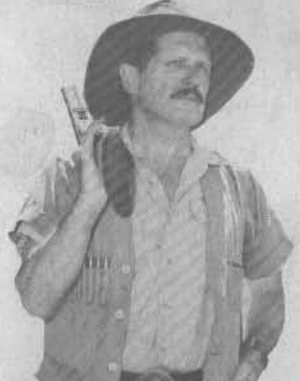

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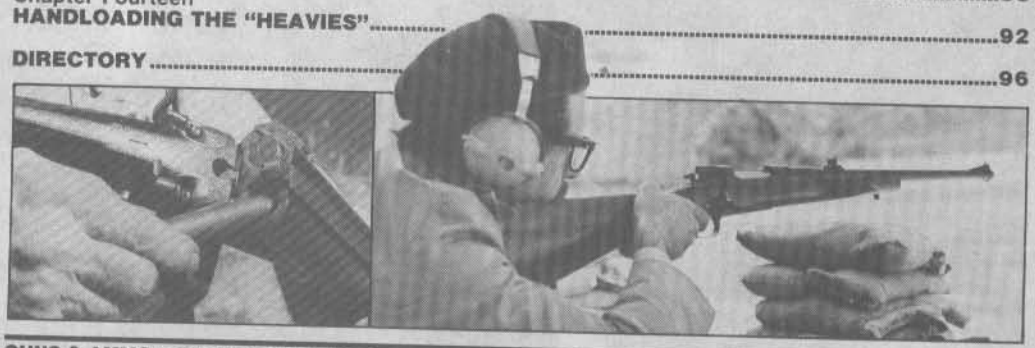

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COVER

Every type of firearm conjures up its own image—the Kentucky rifle calls to mind a buckskin-clad pioneer; a fine double shotgun brings visions of flushing grouse, and staunch-pointing dogs. But heft a big bore rifle and the pulse must quicken as images of charging grizzlies, Cape buffalo, huge Alaskan moose, elephant or lions in the tall grass come to mind. Rifles for this most specialized of hunting, and the cartridges they chamber, from 8 mm Remington Magnum to .458 to the mighty .600 Nitro-Express, in bolt action, single shot or double-barreled persuasion, will all be covered within these pages. For our cover gun nothing could be more appropriate than the old Winchester Model 70 in .375 H&H Magnum—America's first truly powerful modern, mass produced rifle, and the gun that revolutionized our thinking about big bore rifles. Cover photo by PPC photographer Pat Brollier.

CAUTION:

Handloading for the calibers discussed in this book should be conducted with even more than ordinary care. For many of these cartridges, reliable, pressure-tested data is rare or unavailable, and components for many foreign calibers are not manufactured to SAAMI standards. Prospective handloaders, especially those loading for wildcat or foreign cartridges, should use devices like the Powley Computer and PSI Calculator to establish safe starting loads and should work up loads in gradual increments, watching carefully for any signs of pressure and bearing in mind that velocities and pressures vary according to individual rifles. All responsible loading methods should be strictly adhered to. Neither the author nor *Guns & Ammo Specialty Publications* can accept any responsibility for persons using loading data or techniques contained in this book.

ABOUT THE AUTHOR

Born in Baltimore, Maryland, Jack Lott has been an avid shooter and hunter since the age of 17, hunting extensively in the western United States and Mexico. His numerous African safaris include hunts in Mozambique, Rhodesia, South Africa, South West Africa, Nyasaland and Angola, and for a time he operated a safari company in Rhodesia in the 1960s.

A tool designer and experimental machinist, Lott has been a gunsmith, both personal and professional, for many years. He has been a gun writer for over 20 years, and has done much work in internal and external ballistics study and experimentation and cartridge design and development. His articles have appeared in most firearms and hunting publications over the years.

Lott is also a collector of fine big game rifles and rare hunting books, specializing in the arms and literature of African and Asian hunting.

CHAPTER 1

WHAT IS A BIG BORE RIFLE?

Definitions can change with time, and in today's world of powerful belted cartridges, "big bore" means sheer power as well as size!

Once upon a time, a big bore rifle was any caliber from 12-bore (.729-inch) on up, including Sir Samuel Baker's gargantuan 2-bore (1.325-inch) "Baby" by Gibbs, a 20-pound single shot which fired a half-pound shell with a bursting charge of blasting powder! In his book, *Wild Beasts and Their Ways,* Baker stated, "The generally recognized small bores, all of which are termed 'Express' are as follows: the .577, .500, .450, .400 and the toys which are the .360 and the .295."

Baker's heir as top British gun authority of the smokeless era was the late Major Sir Gerald Burrard, DSO, Bart. In the fourth edition of his excellent *Notes On Sporting Rifles* (1953), Burrard defines as "large bores—a rifle the caliber of which is not less than .450-inch." Burrard classed as "Heavy medium bores—a rifle the caliber of which is less than .450 but not less than .400. Medium bores—a rifle the caliber of which is less than .400 but not less than .318. Magnum medium bores—a rifle of medium bore developing muzzle velocities of 2,500 fps or more." He further defined small bores as "calibers less than .318" and "Magnum small bores—small bores which develop muzzle velocities of 2,500 fps or more."

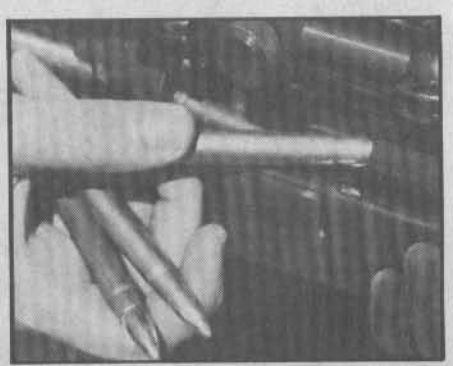
Townsend Whelen, Burrard's U.S. counterpart and until his death in 1961 *Guns & Ammo's* Rifle and Shooting Editor, defined a big bore as, "In America any cartridge of caliber larger than .30." This definition was written in Whelen's 1945 *Small Arms Design and Ballistics* before the incredible proliferation of the factory chamberings in .375, .338, .458 and even hotter big bores. We couple Townsend Whelen's "larger than .30 caliber" definition with energy magnitudes of from about 4,000 foot pounds on up, which excludes such calibers as the .444 Marlin, the .375 Winchester and the .45-70. These are excellent calibers, but their relatively low velocities and light-for-caliber bullet weights place them in a lesser although useful power class.

I can recall when our local range-master would ask, "Small bore or big bore?" when we signed up to shoot. By "big bore," he utilized the popular definition of not only .30 caliber up, but even a .270 was called a "big bore," and nobody laughed. Such imprecise definitions were confusing enough in the past, but in today's big game hunter's jet-transported world and U.S. caliber predominance, updating and redefinition is needed. It may seem presumptuous for me to attempt it, but a logical order derives from current caliber choices as chambered and loaded by the big factories and by the consensus of experienced big game hunters and guides.

With the .458 Winchester Magnum and the .460 Weatherby long established as internationally accepted U.S. factory big bores, the old rangemaster's .30 caliber "big bores" or Baker's .577 "small bore" both sound absurd. Leaving black powder calibers out of the context of our definition, let us address the contemporary advances in ballistics and bullet design by defining big bore as being more of a power designation than purely a dimensional one relating solely to the size of the hole in the barrel. We accept that muzzle energy favors velocity and momentum favors bullet weight, but such calibers as the .340 Weatherby, the 8 mm Remington Magnum and the

The mighty .600 Nitro-Express had the largest caliber of any smokeless powder sporting cartridge, and for many years its muzzle energy was the highest too.

The .45-70 (R) is the same caliber as the .458 (L), but the author does not consider it powerful enough in its factory loadings to be a true "big bore."



Powerful medium bores like the .375 H&H Magnum can be classed with the true big bores because they combine good bullet weight and density with high energies

WHAT IS A BIG BORE RIFLE?

.338 are all in the 4,000 foot pounds energy group and all are suitable for our largest and most dangerous bears with proper bullet weight and construction. They are equally at home on the Old World great cats, eland, zebra and all the larger African antelope. The .375 H&H Magnum, the .378 Weatherby Magnum and even the .340 Weatherby Magnum have been successfully employed on Cape buffalo, rhino and elephant, especially in open or semi-open country with steel-jacketed solids.

In the early days of such calibers there was doubt as to the ability of available bullets to stay together at ultra-high impact velocities. With today's Nosler Partition jacket, Bitterroot soldered core, Speer Grand Slam and other bullets designed to withstand horrendous impact velocities, such magnums have become viable options for dangerous game, but not in thick cover. Most African and North American hunting of dangerous game is in what one might call semi-open country, and much grizzly hunting occurs above timberline or in open tundra. The same is true for much African lion hunting as in the Kalahari and for buffalo on the plains. With steel jacketed solids, such calibers from, say, .338 to .375 and energies of 4,000 ft. lbs. or more are capable of cleanly dropping the biggest elephants in semi-open cover, especially when one is backed by a professional hunter with a heavy stopping rifle. In addition to a capability on dangerous game in the open, such calibers have a wider utility than the .40 caliber and up "heavies," in that they make fine stalking rifles for long range and average range hunting of antelope, elk, moose, caribou and similar game.

Such superior penetration and wounding potential with relatively heavy bullets capable of withstanding ultra-high impact velocities coupled with their impressive muzzle energies tells us that such former "medium bore magnums" deserve inclusion in the big bore category. Whereas we accept that the .30 caliber magnums with similar bullets could be regarded as viable options for similar game, our definition of "big bore" is limited to calibers of over .308-inch and muzzle energies of 4,000 foot pounds or more. By using this "cutoff point" we avoid the blur between the .30-06 and the .300 Magnums and the purely cross-sectional relationship between the .45-70 and the .458. In short, we believe that collective international experience and acceptance justifies and demands this new definition of big bore. The big bores are calibers which are inclusively adequate for the largest and/or dangerous worldwide game from elk, grizzly, eland, moose, lion, tiger and on up through Cape buffalo, rhino and elephant. This is despite admitted exceptions on which successful hunters can disagree.

The predictable challenge to our defini-

For soft-skinned dangerous game in open country, like this grizzly, one of the powerful medium bores like the .338 or .375 Magnum is usually considered ideal.

PHOTO BY LEONARD LEE RUE III

In many jurisdictions today elephant can only be taken with big bore rifles of .375 or .40 caliber and up, although in the past lighter rifles were often used.

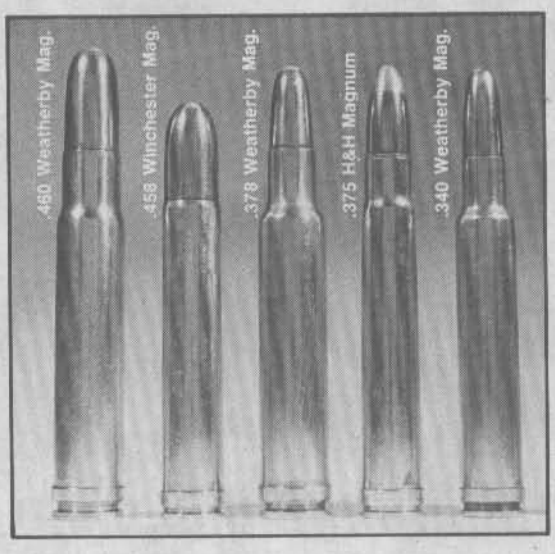
PHOTO BY LEONARD LEE RUE III

Powerful rifles have powerful recoil, as the lights attached to a Remington Model 700 8 mm Remington Mag. indicate by showing muzzle jump in this photo.

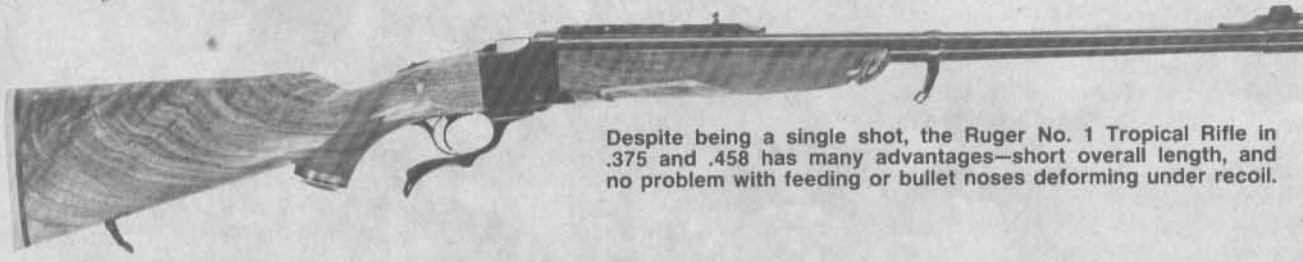
tion is that, for example, the .378 Weatherby Magnum's 5,700 foot pounds of muzzle energy is achieved by giving a 300-grain bullet a muzzle velocity of 2,925 fps, but the .470 Nitro-Express uses a 500-grain bullet which achieves 5,030 foot pounds of muzzle energy with but 2,125 fps velocity. We resolve such an argument by placing the .378 at the lower portion of the big bore spectrum and the .458, .470 and .460 at the upper end. All can be used for the largest game, but the seeming paradox resolves itself by suggesting that the largest calibers of the category are best suited for the heaviest dangerous game at close range and in close cover. The under .40 calibers included are more versatile and are better suited to general big game hunting. With suitable bullets, soft-nosed or solids, and in more open country, these under .40 big bore magnums can also serve on pachyderms when the cover isn't too heavy and the range not so close or if the hunter is backed up by a guide with a suitable "heavy." In starker terms, this means that the .40 caliber and up "magnums" are *stopping rifles* for a guide's "backup" or for the experienced amateur hunting alone with a tracker. For sportsmen who are backed up by a good guide with a .40 or over "heavy," the lesser big bores will usually be sufficient for about any game if used in the open. Game laws, however, vary according to country, and some African countries require that all dangerous game be hunted with calibers of .375 Magnum or over, and some, such as Kenya (now closed), require a .375 Magnum for eland and .40 caliber or over for elephant.

Robert E. Petersen, Chairma of the Board of Petersen Pu lishing Company, with his hunting companion, the illustrious Elmer Keith, took this African lion with a .375 H&H Mag. Calibers like the .338 or .375 are the minimum a prudent man should employ on lion, and in thick cover or in following up a wounded cat, an even larger caliber would be more desirable. At left are the most powerful cartridges which are readily available in the United States. Although they are not shown, most authorities would place the . 338 Win. Mag. and 8 mm Rem. Mag. in the same class as the .340 or .375.

For huge, but normally non-dangerous, animals like this moose, rifles at the lower end of the power spectrum covered by the author make a splendid choice.



Interarms Whitworth Express Rifles are built along the lines of the classic British Mauser-actioned sporters. These rifles are available in .458 Win. Mag., .375 H&H Mag. and 7 mm Rem. Mag.



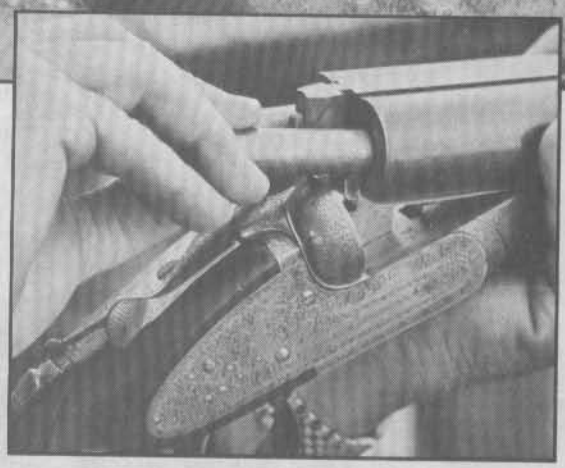
Despite being a single shot, the Ruger No. 1 Tropical Rifle in .375 and .458 has many advantages—short overall length, and no problem with feeding or bullet noses deforming under recoil.

Basic to our discussion of the big b is the premise that caliber is never a re dy for poor placement, or to put it less ously, a big hammer may be best for d ing big nails, but used inaccurately it only smash your thumb or send the flying away!

CHAPTER 2

THE TRUTH ABOUT "STOPPING POWER"!

What makes a cartridge adequate for dangerous game—energy, velocity, bullet weight, "knockout value," momentum—or perhaps a combination of theories?

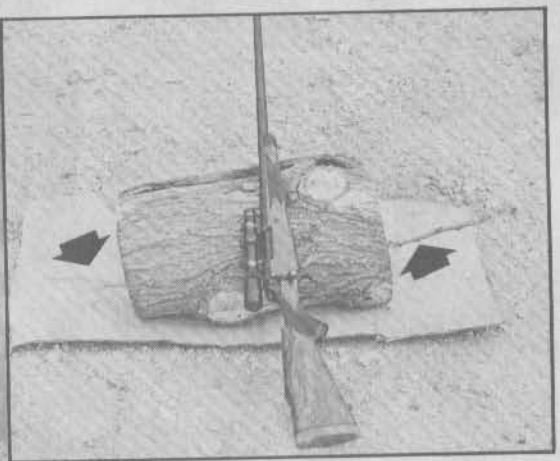


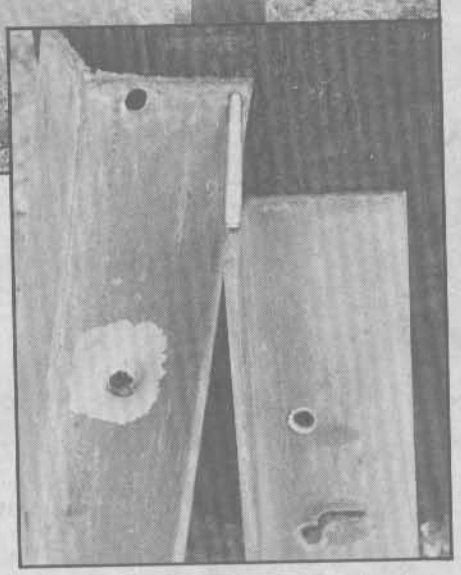
After the elephants, rhinos are the largest land mammals in the world. Even though black rhinos like this are no longer hunted today because of poaching problems, it requires plenty of power to put a huge beast like a rhinoceros down cleanly. The author is of the opinion that real stopping power comes from a suitable combination of velocity and bullet weight, caliber, sectional density and construction. In days gone by, the big double set the standard.

Enough has been written about "stopping power" since black powder days to make a pile worthy of the mountain-climbing prowess of a Hillary. Unfortunately, the ambiguous and often contradictory claims of such theories leave the reader confused. I avoid the term "stopping power." Instead, I prefer the term "wounding power." A 100-grain .22 caliber steel-jacketed solid at 2,500 fps has the ability to drop an elephant as dead as a .577, 750-grain solid at 2,050 fps. However, aside from its illegality for dangerous game in Africa, such an ultra-small bore would hardly be selected for elephant. On the other hand, many elephant have been cleanly taken with a 6.5x54 Mannlicher-Schoenauer 160-grain solid at 2,160 fps before such calibers were outlawed for such game. If by equal "killing power" one means equally lethal, the 6.5 can be said to equal the .577 when both use solids and brain shots are taken. The 6.5 might not drop the elephant as quickly with less than central placement, but either caliber produces the same end results. It is true that the 6.5 solid would be an extremely risky proposition for the shoulder shot, but the .577 is an excellent choice. For a broadside heart shot, low and immediately behind the foreleg, a 6.5 bullet would have no difficulties, and the same for the high lung shot. However, the 6.5 bullet would tend to drop the elephant more slowly, enabling it to move off and die of hemorrhage, or leave it with enough vitality to charge the hunter. The .577's 750-grain solid, on a high lung shot involving both lungs, creates such hemorrhage that within 50 yards, in typical cases, an elephant drops for good. A heart shot elephant with that vital organ punctured by a .264-inch, 160-grain 6.5 solid can usually function semi-normally for a short time, in which he can make off for as long as it takes for the wound to take effect. Such gaps between wounding and the *finis* encourage charges, which can result in dire consequences for the hunter or his companions. It will soon die, but not so quickly as with a .577 in the same place, or a .458 or .375. Remember, "the boat sinks slowly with but a tiny hole through the hull." The similar performance of the 6.5 and the .577 on brain shots is because the central nervous system is much more sensitive to damage than mechanical or hydraulic systems like the heart and lungs.

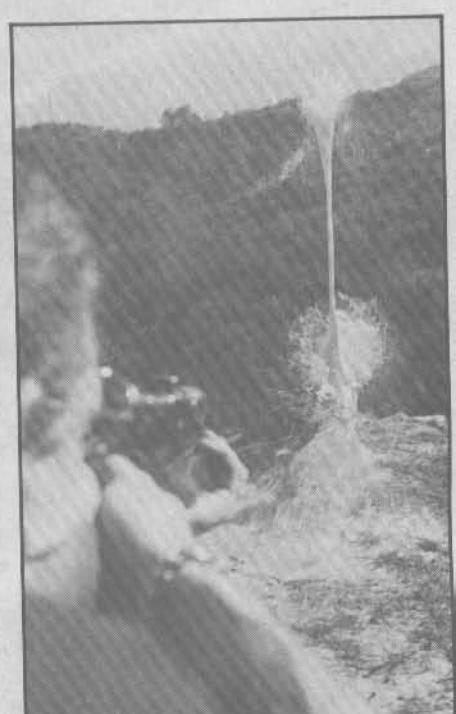
Such examples involve two calibers which have been used in elephant hunting in Africa, and they are based on actual field results, not theory. If the elephant charges, and a 750-grain .577 solid is

Almost any high velocity cartridge can demolish a plastic jug full of water impressively, but this .416 Van Horn wildcat has stopping power to spare.





Above: A soft-point Barnes bullet from the .416 Van Horn penetrated two ¼-inch thick pieces of angle iron. Top right: A solid penetrated a 26-inch log section.



Blowing up a can of paint with a high velocity bullet makes spectacular photos, but such demonstrations tell us little about a round's stopping power

placed through the upper trunk and into the throat, the big arteries above the heart will be cut and the elephant will usually turn or drop. On the other hand, the same shot cannot safely be taken with a 6.5 or, say, a .30-06, though the end result may be the same. In saying there will be delays between the final effect of identical shots with the 6.5, I refer to seconds or at most a minute or two. But at close quarters, such delays often carry grave penalties. It must be noted that thus far at no point have I discussed poorly placed shots, but shots which are as well placed as a cool, reliable shot can place them.

Let us now turn to the more common situation where, with a snap-shot at close range, in close cover, the placement is off. If the elephant is unwounded and facing us head-on, a frontal head shot with the 6.5 which misses the brain by some 2½ inches will hardly cause him to falter. It will, however, surely annoy him, and it could make him charge during any follow-up. Had the same shot been taken with a .458, the typical result is for the elephant to crash to the ground unconscious, for enough of an interval to permit the hunter to put in a "finisher." In case of a charge, this "knockout," as John Taylor called it, is vital to save our life or the lives of our trackers and gunbearers. It is the power essential to the professional hunter to protect his client and his African staff.

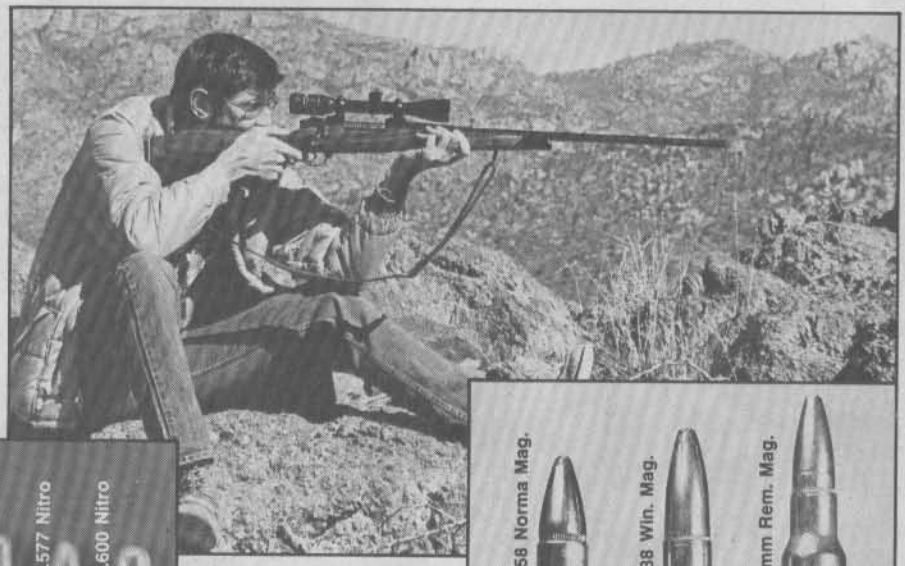
How does this square with the fact that the great "Karamojo" Bell and other ivory hunters used the 6.5 mm, the 7x57 and other small bolt action calibers to cleanly take huge bags of elephant? To begin with, very few of the best big game hunters had, or have, the anatomical placement capability of a Bell. Secondly, Bell hunted when the elephant were unspoiled and less wary, normally feeding in the open during daylight hours, something almost unknown today. Finally, Bell waited for the perfect brain shot, and unless everything was just right, he held his fire. Sometimes he took heart and lung shots with his light rifles, but he was a superb physical specimen and could and often did dodge and run from charging elephant. As a result of trying to emulate Bell, many hunters have been killed or mutilated, as well as leaving many wounded elephant to wander off and die a slow, wasted death. Thus, in such extreme comparisons as between the 6.5 and the .577, the advantages of the larger bores are justified by humane considerations—both to the hunter and the game.

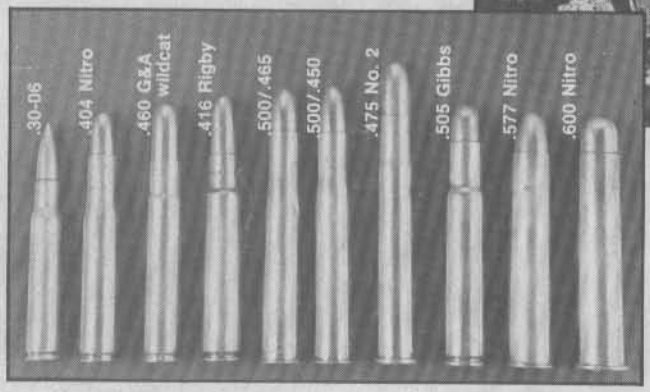
The performance of solids of the various calibers used for thick-skinned dangerous game is subject to fewer variables than that of expanding bullets used for soft-skinned dangerous game such as grizzly. There still remain some questions about the performance of solids, but experience and design make it simpler. Basic is the fact that solids aren't supposed to expand or deform, but to rely on penetration in a straight course alone. It is obvious that with solids, larger calibers produce larger wounds. If a solid is adequate to resist deformation on the heaviest bones of the game it is designed for, it should be steel-jacketed, gilding metal-plated, with a lead core. The old cupronickel or gilding metal solids of earlier days proved inadequate to resist deformation. Today, some individual solids fracture on shots that others from the same lot penetrate without deforming. Individual bullets can have flaws in the jacket which become cracks and rupture under impact stress. In other cases an entire lot of solids can be prone to jacket fractures due to cold-rolled cannelures with square corners creating a built-in jacket fracture line exactly like those divisions between the sections of a Hershey bar. When the cannelure is rolled on with a new tool, the corners are sharper, and in addition, the cannelure area is work-hardened (embrittled). The best cannelure is one which has no sharp corners and is concave and radiused. Some of those on the old Kynoch (British) bullets were radiused and as a result the

"STOPPING POWER"!

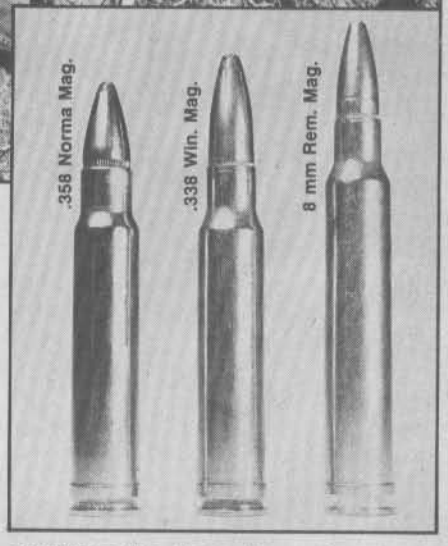
rarely caused fractures of the bullet jacket.

With adequately constructed steel-jacketed solids, comparison of various calibers can be resolved by simple terms. A solid's "wound channel" can, for the sake of clarity, be viewed as a cylinder, with its diameter the bullet diameter and its length the depth of penetration achieved. Obviously, the larger caliber of ample sectional density (ratio of sectional area to weight) makes the largest "cylinder" in volume with equal penetration. "Knockdown" effect with solids can only be estimated empirically, since individual animals vary as to mental state, physical condition, wounded or not, etc., but since solids are non-expanding, they are amenable to more precise analysis. The late John "Pondoro" Taylor, professional elephant hunter, presented his "knockout" formula in his great 1948 book *African Rifles & Cartridges*. It is based on multiplying bullet weight times velocity, times caliber, then dividing by 7,000. Others, such as the late Truman Fowler, incorrectly attempted to apply Taylor's formula for solids to expanding bullets, but since rates of expansion, design and jackets and cores vary so much, the formula won't work.





Close range stopping power on dangerous big game is usually best achieved with a big caliber bullet of reasonable weight moving at a moderate velocity. The big British nitro rounds at left are all so designed.



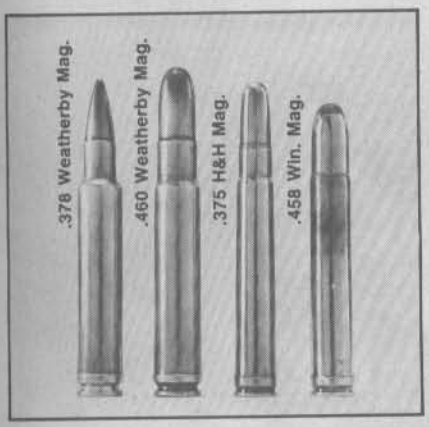
Cartridges like those shown above or in the .340 Weatherby being fired at top are the best medicine for large, soft-skinned animals at the longer ranges.

Taylor's approach to the subject attempts to correlate the accumulated results of experience over the years of using nitro-expresses with cupro-nickel solids of prewar years. Taylor's "knockout" formula also failed to credit Rigby's then unique steel-jacketed solids for standing head and shoulders above the typical cupro-nickel solids. Rigby's .416 solid was the only "big bore" steel-jacketed solid until the late 1950s when Kynoch converted most solids to steel jackets. Rigby's .350 solids—the 225-grain .350 Rigby Magnum solid and the 310-grain .400/.350 solid—were also steel. The superior construction (steel) of Rigby's prewar solids was worth a lot more to an elephant or Cape buffalo hunter than larger caliber with only cupro-nickel or gilding metal jackets which often become

TAYLOR'S KNOCKOUT VALUES

Cartridge	Bullet Weight (grains)	Velocity (fps) Muzzle	Velocity (fps) 300 Yd.	Energy (ft. lbs.) Muzzle	Energy (ft. lbs.) 300 Yd.	Taylor's Table of K.O. Values Muzzle	Taylor's Table of K.O. Values 300 Yd.
.338 Win. Mag.	200 PPSP	3000	2170	4000	2090	28.2	20.4
.338 Win. Mag.	250 ST (Exp.)	2700	1940	4050	2090	31.8	22.8
.338 Win. Mag.	300 PP (SP)	2450	1690	4000	1900	34.6	23.9
.340 Weatherby Mag.	200 Pt. Exp.	3210	2348	4566	2442	30.2	21.9
.340 Weatherby Mag.	250 Pt. Exp.	2850	2090	4510	2425	33.5	24.6
.375 H&H Mag.	270 PP (SP)	2740	1990	4500	2370	40.1	28.4
.375 H&H Mag.	300 ST (Exp.)	2550	1830	4330	2230	40.4	29.0
.378 Weatherby Mag.	270 Pt. Exp.	3180	2315	6051	3210	45.3	33.0
.378 Weatherby Mag.	300 Pt. Exp.	2925	2125	5700	3009	46.3	33.6
.416 Rigby	410 SP	2350	1780	5010	2900	57.25	42.7
.404 Jeffery	400 SP	2125	1580	4020	2200	49.0	36.0
.400 Jeffery	400 SP	2125	1590	4010	2250	48.6	36.3
.450 Cordite	480 SP	2175	1530	5050	2650	67.1	47.0
.458 Win. Mag.	510 SP	2130	1400	5140	2220	69.8	45.9
.460 Weatherby Mag.	500 RN	2700	1730	8095	3320	86.7	55.6
.465 H&H	480 SP	2125	1530	4820	2500	67.7	48.2
.470 Cordite	500 SP	2125	1500	5030	2500	71.3	50.3
.476 Cordite	520 SP	2100	1490	5100	2570	74.2	50.5
.500 3" Cordite	570 SP	2125	1440	5730	2640	86.5	58.6
.577 3" Cordite	750 SP	2050	1210	7020	2440	126.7	71.9
.600 Cordite	900 SP	1950	1250	7610	3130	150.4	96.4

SP—soft point; RN—round nose; Pt. Exp.—pointed expanding; ST—Silvertip; PP—Power Point



These rounds are the most powerful for which factory loaded ammo is readily available in the United States. All four of them are in the "stopper" category.

deformed on bones and lose direction.

According to the collective experience of thousands of professional hunters, advanced amateurs and game rangers, the .450 3¼-inch Rigby Nitro-Express with its .458-inch, 480-grain solid bullet at 2,150 fps and energy of 4,930 ft. lbs. was the power standard for elephant and buffalo. This consensus was ratified by Holland's introducing their .500/.450, followed by Jeffery's .450 No. 2, all using 480-grain bullets at similar velocities.

Above the .450s, .465, .470 and similar rounds are the two .500s, the three-inch and the 3¼-inch, both firing .510-inch bullets of 570 grains at 2,150 fps. Veteran ivory hunters like John A. Hunter found the .500 to be the best combination of "knockdown" and penetration for heavy dangerous game in guns of manageable weight. If anything more in "knockdown" and penetration was wanted, the .577 Nitro-Express provided it in good measure. The .577 and all other large bore nitro-expresses, with the exception of the .600 (which never had steel-jacketed solids), reached the ultimate of their capabilities when Kynoch replaced the old cupro-nickel and early postwar gilding metal jackets with steel plated with "Nobeloy" (gilding metal). With such solids, the plague of deformation problems and loss of direction inside the game was ended with the exception of defective solids. With equal penetration, the bigger the caliber of solid, the greater the wound, and hence the greater the "knockdown" or stopping effect. It is also true that given high sectional density, the bigger the solid

ESTIMATED EFFECTIVE ENERGY

Muzzle energy (kinetic energy) or the energy of a given weight bullet at any given velocity is determined by the formula $E=\frac{1}{2}MV^2$ (E=energy, M=mass, V=velocity). In this author's opinion, kinetic energy is not a true indicator of *effective energy* since energy increases proportionate to the *square* of velocity, giving undue credit to light bullets at higher velocity.

These Estimated Effective Energy tables represent relative values obtained by including the factors of sectional density and caliber in inch decimals for EEE (1) and the factor of caliber in inch decimals for EEE (2). EEE (1) applies when all bullets are of equal and proportional prewar conventional soft-nosed type so as to eliminate design and construction variables. EEE (2) multiplies caliber times energy in the case of Nosler Partition Jacket and Bitterroot Bonded Core bullets only, because they are constructed to resist ultra-high impact velocities and therefore do not rely on sectional density for retention of adequate expanded weight and adequate penetration. The values of EEE (1) and EEE (2) do not represent kinetic energy or fractions thereof, but simply a relative scale of performance in expansion combined with penetration. We call attention to the almost identical EEE (1) with the 200-grain .300 Winchester Mag. load at 331 EEE (1) and with the 200-grain .338 Winchester Mag. load at 330 EEE (1). The 200-grain .308-inch .300 Winchester Mag. bullet has a sectional density of .302, a velocity of 2,830 fps and muzzle energy of 3,560 ft. lbs. The 200-grain .338 bullet has a sectional density of .250, a velocity of 2,960 fps and energy of 3,890 ft. lbs., but our EEE (1) formula penalizes it for its inferior sectional density so that the superior energy of the 200-gr. .338 load is somewhat offset by a lesser penetrative capability than the 200-gr. .300 Winchester Mag. bullet at lower velocity and energy. But when we move on to the EEE (2) table for Nosler*, Bitterroot bullets, or similar "super-bullets," which do not require superior sectional density to retain adequate weight for penetration and which hold together with high impact velocities, the situation is different. The EEE (2) figure for the 200-grain .300 Winchester Mag. load is 1,096 and that of the 200-grain .338 load is 1,314. Why? The larger caliber and higher striking velocity of the 200-grain .338 bullet depend on tougher construction for full expansion without bustup and plenty of penetration with modest sectional density. Note that the lowest sectional density (.250) is the same as that of a 165-grain .308-inch bullet which is a decent weight for that caliber. We do not advocate any bullet for big game with a sectional density under .230.

*Nosler Partition Jacket only.

MUZZLE ENERGY & ESTIMATED EFFECTIVE ENERGY

Cartridge	Bullet (grains)	Muzzle Velocity	Muzzle Energy	EEE (1) CxSDxE*	EEE (2) CxE**	Sectional Density	Comments
.30-06	180	2700	2913	245	897	.272	
.300 Win.	180	2960	3501	294	1078	.272	
" "	200	2830	3560	331	1096	.302	
.300 Wby.	180	3245	4210	354	1296	.272	
.338 Win.	200	2960	3890	330	1314	.250	
" "	250	2660	3927	416	1327	.313	
.340 Wby.	200	3210	4577	389	1547	.250	
" "	250	2850	4510	478	1524	.313	
.375 H&H	270	2690	4337	447	1626	.275	Nosler not avail.
" "	300	2530	4263	490	1598	.306	"
.378 Wby.	270	3180	6064	625	2274	.275	"
" "	300	2925	5700	656	2137	.306	"
.458 Win.	500	2040	4620	740	2116	.350	Nosler & Bitterroot not avail.
.460 G&A	500	2350	6125	980	2805	.350	"
.460 Wby.	500	2700	8095	1295	3707	.350	"

(C-caliber; SD-sectional density)

**The values in this EEE (1) formula table do not represent an evaluation of existing factory loads, but rather are applied to hypothetical bullets of uniformly similar design and construction to eliminate such variables as occur with the various factory soft-nosed bullets.*

***The EEE (2) scale of values applies solely to Nosler Partition Jacket bullets, Bitterroot Bonded Core bullets and similar modern controlled expansion designs because these bullets do not rely on superior sectional density for maximum energy transfer combined with weight retention.*

"STOPPING POWER"!

bullet, the better it smashed heavy bones.

Expanding bullets are the ones most hunters use, because they produce the maximum energy transfer, and because most game from deer to antelope require less than maximum penetration. Kinetic energy is the standard formula for stating the capacity in foot pounds of a bullet to perform work at a particular velocity. It is the basis for muzzle energies in the ballistic charts and is perhaps the only precisely accurate way to measure quantitative bullet power at given velocities. It doesn't tell us how that power will perform work, but like horsepower, it quantifies it. For example, a car of a certain horsepower engine can reach 100 m.p.h. on the level with a certain engine r.p.m. and high gear. In low gear and the same engine r.p.m. it can climb steep hills. It's the same *quantitative* power in either gear, but with a different type of performance. Kinetic energy is $E=\frac{1}{2}MV^2$, when E is energy and M is mass and V is velocity, or Energy is Mass times Velocity squared divided by two.

Kinetic energy figures cause much confusion by encouraging many to equate muzzle (quantitative) energy with performance (qualitative). Thus a .300 magnum with a 180-grain bullet at 3,245 fps has a muzzle energy of 4,201 ft. lbs. and the .375 H&H Magnum with a 300-grain bullet at 2,550 fps has a muzzle energy of 4,330 ft. lbs. Are they equal in power? Just about, but not in the ways that power is exerted. In what way would the .300 be inadequate where the .375 would be adequate or better? We're not discussing solids here, in which cases the .375 produces the larger impact area and wound channel. Before expansion, the .375 soft nose bullet makes a larger entrance hole, and with much more weight to begin with it has more weight to lose, a vital aspect on the heavy bones of larger game.

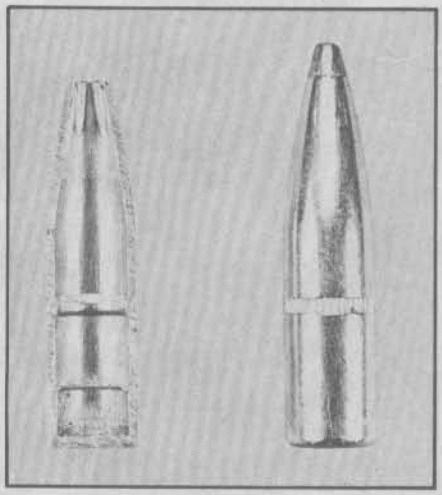
Since both the .300 and the .375 produce similar muzzle energy, that of the .375 is produced by more bullet weight and lower velocity. The closer the range at impact, the faster the 180-grain .308-inch bullet loses weight, providing its construction is strong enough to prevent its blowing up completely on impact. The slower 300-grain .375 bullet is less damaged and stressed by impact velocities, and bullet construction is less demanding. On the other hand, flat-shooting magnums of the .300 Winchester and Weatherby type are not so much designed to equal the effect of a .375 at close to medium range as to provide flat trajectory and the high impact velocities for the longer ranges. Another view is that at ordinary hunting ranges (within 150 yards), the ultra-high striking velocities cause bullet blowup which advocates of the "hydrostatic shock" effect see as not a liability, but as the best way to "shock" a beast to death, even with imprecise placement. Though I do not agree with this

PHOTO BY LEN RUE, JR.

Elk are large animals weighing up to 800 pounds. Most authorities recommend a bullet of good weight and sectional density to cleanly drop these huge deer.

school of ballistic thinking, I must recognize the remarkable effect of ultra-high velocity on relatively light bullets. Without such ultra-high striking velocities, such small bullets as the 130-grain .270 bullet are truly small game bullets, but we know that this bullet is very deadly on deer and small antelope, and that but for its ultra-high velocity it would not be. To illustrate this, take a plastic jug or can filled with water and place it at 50 yards or so, then fire at it with an ultra-high velocity cartridge such as the .270 with a 130-grain bullet. The violence of the explosion is a miniature "bomb," but slip a reduced load in the same chamber which pushes a 130-grain bullet at half the velocity, and you will see what that higher velocity did in the way of more "work"! This is why such a bullet is often so devastating when it enters the water-logged paunch of a herbivore, exploding the wet stomach contents just like it did the plastic jug. The same is true of body fluids—blood, lymph and spinal fluids, which transmit such explosive force like you do hydraulically when you step on the brake pedal. Water and other water-like body fluids are non-compressible, and when such explosive forces are released within them, they react violently themselves, and force adjacent fluids and tissue to become transmitters of this explosive force, which on neck shots on light game can destroy the spinal connection or the base of the brain. However, when these same bullets are tried on charging lion or unwounded Cape buffalo, such "hydrostatic shock" is not only wasted, but it is dangerous. Too many men have died from such foolhardiness, including George Grey, a brave man and a fine shot who happened to try the "hydrostatic shock" of his .280 Ross on a Kenya lion. Joe Shaw, the late American sportsman, came to his end in similar fashion in Angola in 1963, when he tried "shocking" a charging lion with a .30 magnum at point blank range! Possibly both Grey and Shaw would not have survived even with a .458; but at least they would have had a very good chance.

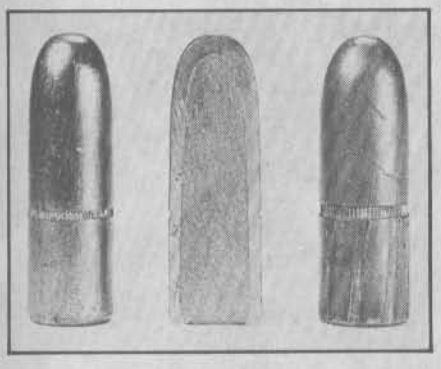
There is nothing wrong with the energy figures for the .300 magnums for charging bear or standing Cape buffalo, but the energy should be for a larger caliber bullet of good sectional density and lower, but not too low, velocity. At close range where charges take place, experience favors the .375 over any smaller caliber, but for charging lion or tiger, experience favors



Hornady Interlock bullets have a sharp ridge inside the jacket near the base. Swaging pressure forces the lead core behind the ridge and locks it in place.

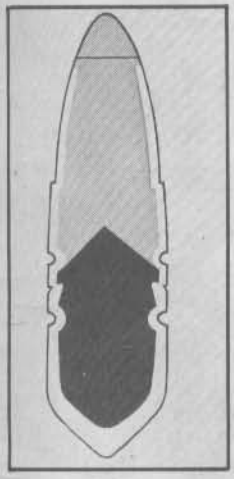
heavier bullets and larger calibers such as the .416, .404 or .450/.400. Even better for the charging big cats are the .450 Rigby, .470 or a .458 with a full load of Reloder 7 and one of Hornady's new 500-grain soft-nosed bullets. The closer the range, the more such big bores have the advantage on charging game.

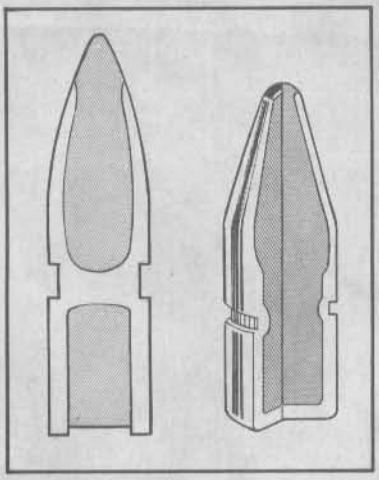
One famous formula for determining wounding power is the "Knockdown" formula favored by *G&A's* executive editor, Elmer Keith. It is commonly referred to as the "pounds-feet" theory. Keith multiplies muzzle velocity times weight in grains and divides by 7,000 to obtain "pounds-feet." For a .405 WCF, the bullet weighs 300 grains and muzzle velocity is 2,200 fps. Multiply 2,200 times 300 and we get 660,000 which divided by 7,000 results in 94.28 "pounds-feet." Keith's method is similar to the late Gen. Hatcher's "RSP" (relative stopping power) formula, but it leaves out caliber or sectional area, which is important. To illustrate what I mean, consider your choice of either a 200-grain .357 caliber handgun which produces 900 fps velocity, or a .45 caliber handgun with the same weight bullet and velocity. You have a 12 o'clock "high noon" appointment at the corral with "Rancid Randy," who they say has "cured" several chaps of all earthly aches and pains as well as problems! If penetration of either cartridge's bullet is adequate, which caliber, .38 or .45, would provide you with the most stopping power? How many would prefer the .38? Not many hands raised!



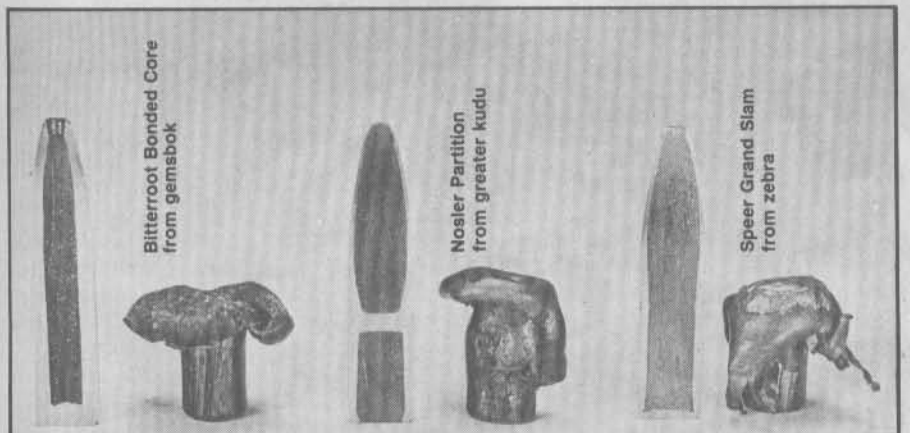
The Hornady 500-grain .458 bullet has an extremely thick steel jacket. The bullet at right was recovered from a Cape buffalo with no distortion at all.

Another formula is the "Momentum" theory. Simply stated, it is bullet weight in hundreds of grains times velocity in hundreds of feet per second. P.O. Ackley's *Handbook For Shooters and Reloaders* gives the example of a Sharps .45-120-550 buffalo round and a 200-grain bullet at 2,400 fps. Both bullets produce the same 2,560 ft. lbs. of energy, but the Sharps' 550-grain bullet does it at 1,450 fps. But by using the Momentum formula, the Sharps bullet produces a value of 80, and that of the 200-grain bullet a value of 48. This system has value, especially in comparing modern light bullet, high-velocity calibers with black powder, heavy bullet, low to moderate velocity calibers.





Among the designs for soft-nosed bullets that attempt to combine good penetration and weight retention with rapid expansion is the famous Brenneke TUG (far left). It uses two bullet cores, the rear of hard lead alloy and the front of a softer alloy. Similar in concept is the Nosler Partition bullet at left (shown with a conventional soft-point bullet, right). The core in front of the partition expands and the core in the rear of the partition holds together to penetrate.



All of the bullets shown above are 175-grainers fired from a 7 mm Magnum. Next to the sectioned bullets are their expanded counterparts taken from African game.

The advantages of larger diameter and heavier weight bullets for larger game have been consistent through both the black powder and smokeless eras. The larger caliber makes a larger entrance and wound channel for greater blood flow and impact area before expansion or even if no expansion takes place as with solids. Especially in prewar years, there was ample reason to reject muzzle energy as a means of gauging bullet power at a given velocity. The big bullet held "all the cards" for the heavier species using expanding styles. This still applies for conventional bullet designs. The bigger bore, heavy bullet does more and deeper damage before it loses a significant amount of bullet weight from fragmentation—and it has more weight to lose. With conventional bullets of prewar design, arguments between advocates of a .30 Magnum and a .375 Magnum for large bears, lion and tiger invariably brought experience down on the side of the .375. In view of the close to moderate ranges at which such game is taken, any flatness of trajectory advantage of the smaller bore is irrelevant here.

Beginning after World War II, the proliferation of over-.30 caliber wildcat magnums and "improved" magnums such as the .334 O.K.H., the .375 Weatherby and other "improved" .375 magnums led to the .338 Winchester Magnum, the .340 Weatherby Magnum and the .378 Weatherby Magnum, to name a few. The recently introduced 8 mm Remington Magnum is another of this breed of big bore magnums with high striking velocities at longish ranges due to high sectional density bullets. Such big bore magnums have, thanks to Elmer Keith, their pioneer advocate and chief publicist, upgraded the hunter's long range capability by delivering large caliber bullets of high sectional density to the longest practical ranges. This has done for today's big game hunter what Sharps did with the great .45-120-550 for the long range black powder big game hunter.

Despite limitations in using kinetic energy as a guide to wounding or stopping power, it is the only scientific formula for computing a bullet's capacity to perform work. The problem is that it confers on small caliber light bullets a disproportionate amount of energy from a practical standpoint. Both the .375 H&H and the .300 Weatherby Magnums are near equals in muzzle energy. The .375 with a 300-grain bullet at 2,550 fps produces 4,330 ft. lbs. of muzzle energy. The .300 Weatherby with a 180-grain bullet at 3,245 fps (from a 26-inch barrel) produces 4,201 ft. lbs. Undoubtedly these energies are scientific, but the energy of the .300 works best at ranges over, say, 75 yards and on lighter-boned and muscled game, whereas the energy of the .375's 300-grain bullet performs better on heavier game at closer ranges. At

"STOPPING POWER"!

long hunting range the .375 will also give a good account of itself, but range estimation must be close or the .375's higher trajectory may result in a miss.

Criticism of caliber comparisons based on muzzle energy was even move valid in prewar days with bullet design vintage 1910, but with the advent of the Nosler Partition Jacket bullet after WWII, the validity of using kinetic energy for measuring the wounding power of the magnums loaded with Noslers moved closer to the practical. With the Nosler Partition, the front section expands fully upon or soon after impact, until most or all of the front core expands, leaving the mushroomed flanges of the nose jacket, the rear jacket and core protected by the partition still intact to carry on to the limit of penetration.

The Nosler's strong "partition" web section protects the rear core, and along with the expanded flanges of the front section creates a semi-solid type of projectile. This makes it superior, in ultra-high velocity magnums caliber for caliber, weight for weight, to conventional types for bone penetration. A 130-grain Nosler Partition .270 bullet expands fully up to the longest hunting ranges, but at close range, where a conventional bullet of the same caliber and weight may blow up, the Nosler Partition won't. What this means in terms of wounding and stopping power is that the benefits of ultra-high velocity—hydraulic shock, explosive tissue and fluid disruption, etc.—are there, but without a sacrifice of adequate penetration. In the '60s, Bill Steigers of Lewiston, Idaho, president and founder of the Bitterroot Bullet Co., discovered a method of permanently bonding bullet jackets to cores, resulting in the remarkable Bitterroot Bonded Core Bullets. Bitterroot's cores are actually soldered to their jackets, and the pure copper jacket makes them incomparably tough, resisting breakup at the highest striking velocities. Steigers has, with his Bitterroots, eliminated the former need to use the heaviest bullets per caliber, such as the 300-grain .338 instead of a 200, or the 300-grain .358-inch instead of a 225-grain. He advocates using his bullets in the lighter weights since the old reason for selecting a heavy for caliber bullet—to retain more weight—is unnecessary with Bitterroots since they rarely lose more than 10 percent of original weight. Steigers points out that this also results in less recoil and flatter trajectory at hunting ranges. He also advocates a faster by 20 to 25 percent rifling twist than standard to utilize the superior construction of Bitterroots in making deeper and wider wounds by increasing rotational velocity for longer point-forward stability *inside* the game and for turning those expanded jacket flanges into centrifugally deadly "buzz saws." In my experience, it is rare to weigh an expanded Bitterroot from game with less than 90 percent of the bullet's original weight remaining.

Another advanced bullet, the Speer "Grand Slam" "Mag-Tip" Hot-Cor, is proving itself in withstanding high-impact velocities, based on my experience with "torture testing" Speer's new 285-grain .375 Grand Slam with its improved base jacket of .075-inch thickness. I am left with the thought that this is a bullet I would definitely like to try in Africa or Alaska on the heaviest thin-skinned game and also on broadside shots at standing Cape buffalo, if unwounded. I would never advocate the use of any .375 caliber on wounded buffalo unless one has no choice.

Instead of bypassing the only scientific way of measuring the power of a bullet to perform work at a specific velocity, the right course is to begin with muzzle energy or striking energy at a specific range. By starting with a known magnitude of bullet power at any velocity, one can then modify this kinetic energy figure to reflect caliber and superior or inferior sectional density. Ultra-high velocity smaller caliber bullets of low sectional density produce high kinetic energy equal to larger caliber, slower-moving bullets of higher sectional density. If of *conventional* design, such bullets won't penetrate adequately or consistently to the vitals of heavy muscled, heavy boned big game. Premature bullet disintegration takes care of that. If we confine our calculations to conventional soft nose bullets, we can, in fact, use kinetic energy to begin our quest for comparative wounding capability between calibers. To account for the effect of ultra-high impact velocities on conventional bullet weight retention, we modify the energy figure by multiplying sectional density times caliber. Then we multiply this result times muzzle or striking energy. For the .300 Weatherby's 180-grain bullet at 4,201 ft. lbs. muzzle energy, the sectional density is .272. This times caliber (.308) becomes .084. This times the .300's muzzle energy, or 4,201, results in the figure .353. Now compare this figure with results for the .375 H&H Magnums. Its 300-grain bullet's sectional density is .306. This times caliber (.375) makes .115, and this times muzzle energy, or 4,330, comes to .498. This gives bigger caliber, heavier bullet and

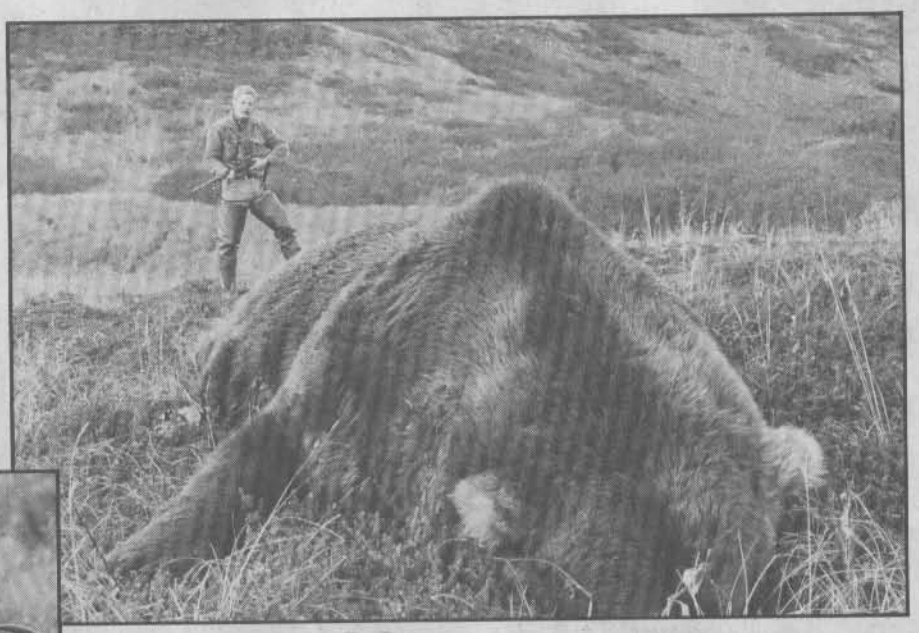
PHOTO BY LEONARD LEE RUE III

PHOTO BY LEONARD LEE RUE, III

Both leopard (camouflaged above) and moose (right) need rounds of considerable power. The leopard has immense vitality and great speed. Wounded, it is extremely dangerous to the hunter. Moose are huge and have a phlegmatic nervous system that lets them soak up bullet after bullet. Cartridges like the .338 or .375 Magnums make excellent choices for hunting either animal.

lower velocity its practical advantages and it fairly penalizes near-equal smaller caliber's energies for smaller bore and lighter bullets impacting at much higher velocities. I call this resulting figure "EEE" or estimated effective energy. This is intended *only* for prewar type *conventional* bullet designs of simple soft-nosed type. Naturally, it (conventional design) favors moderate velocity, big bore and heavy bullets over small caliber light bullets with inferior sectional density and which tend to blow up on close range impact at their ultra-high striking velocities.

Now let us turn to modern "super bullets" which are designed to resist the high-



Of all North American big game, a stopping rifle is most needed for the great bears of Alaska. This monstrous old brownie required five slugs from a .375 H&H Magnum to anchor him, and his hide squared about 11 feet.

PHOTO BY LEONARD LEE RUE, III

Legendary for his ability to absorb punishment and press home a charge, old *M'Bogo*, the Cape buffalo, provides many of the truest tests of stopping power.

velocity bustup of conventional bullets. The two designs which are defintely in this category are the Nosler Partition Jacket and the Bitterroot. We are, of course, talking only of expanding bullets, and I recognize that other designs will come along and do similar work, and still others, such as Speer's Grand Slam and Hornady's Interlock, border on such a category, if not actually belonging in it, if the improved versions I have tested are typical. Sectional density isn't so vital to such bullets, since once inside the game, the lighter bullets such as the 200-grain .338 retain more weight than conventional heavier bullets per caliber do. With conventional bullets, the advantage of high sectional density, aside from its importance to ballistic coefficient for retaining velocity, is that after the expected weight loss inside the game, there is more weight left. However, when full expansion takes place, sectional density is "gone to hell" anyway. These "super bullets" don't "commit suicide" in the lighter for caliber weights, such as the 200-grain .338, the 225-grain .358 or the 270-grain .375 in prewar conventional design at ultra-high striking velocities above those of the .375 H&H Magnum, for example. And they can use more velocity than standard, since they withstand it. If they lose significant weight, it is invariably after deep pen-

The laws of physics being what they are, powerful stopping rifles push on the butt end too. *G&A Books* editor Craig Boddington fires the author's .577 Nitro.

etration. Since sectional density is not critical with such bullets due to their strong construction, we can create a special formula which excludes sectional density for such bullets *only*. Again we begin with the known absolute of muzzle energy and multiply by caliber. This gives larger caliber its due for inherently larger diameter entrance holes and wound channels. It also gives the lighter, smaller caliber bullet its due for higher striking velocity, which with such bullets will not be enervated by premature blowup and fragmentation. Take the .300 Weatherby again, this time with a 180-grain Nosler Partition Jacket, and multiply caliber (.308) times energy (4,201); the result is 1,294. Now do the same with the .375 Magnum. Multiply the caliber (.375) times energy (4,330) for the 300-grain bullet and the result is 1,623. The previous formula (EEE) showed a 41 percent gap between the .300 Weatherby 180-grain load and the 300-grain .375 Magnum load. With my second formula for Noslers and Bitterroots or any other similar performing strong bullet, the difference between the two similarly energized cartridges is 25 percent. This reflects the more efficient utilization of the .300's ultra-high striking velocity which is then not blown away in premature bustup. It doesn't quite equal the figure for the .375, but with a smaller caliber and lighter bullet it is a fair comparison. It also shows clearly, in the results of the two different formulae, the waste of energy (at average ranges) of the ultra-high velocity magnums which use conventional 1910 vintage bullet design.

Finally, what are the inherent advantages of bigger bores? I can think of several—more base area for gas to push on for higher velocity with less pressure per foot seconds velocity than with same weight bullets of smaller caliber, larger impact area with no expansion and larger diameter wound channel even *before* expansion. The impact area, striking area, or the non-expanding solid's sectional area, increases not to the proportion of the increase in bullet diameter, but relative to the *square* of the diameter. Heavier bullets of equal sectional density, construction being equal, penetrate bigger muscles and break heavier bones than lighter bullets and smaller calibers. Larger bores are more accurate in relation to caliber and weight, since diameter variations are no larger with the big bores, nor weight variations, nor bore variations in diameter, but such variables represent much less of a percentage of a heavy bullet's factors than they do for smaller caliber bullets. In short, bigger is better in calibers so long as everything is in sync—bullet weight, twist, shape, velocity, load, sights, and a rifle and shooter which function well together.

CHAPTER 3

With its legendary range, accuracy and awesome stopping power, nothing is more symbolic of our westward expansion than . . .

THE BUFFALO GUN

The American breechloader came into its own after the Civil War with the opening up of the West to settlement and buffalo hunting; these events brought about the first commercial demand for truly powerful rifles. The primary demand for such ordnance was to provide the buffalo hunter with both the extra power and the long range capability demanded by the commercial hide hunters and also those who hunted the grizzly and the "elk" (wapiti). Surplus .50-70 and .45-70 Springfield "Trapdoor" single shots and Remington rolling blocks became very popular as reliable buffalo rifles, but the herds soon were thinned out and shots became longer. Buffalo "runners," to use their own term, had to be able to take the great bovines at long range or lose out, especially after the decline of the herds in the Seventies. The Sharps Rifle Company was uniquely prepared to accommodate such riflemen-hunters among the "runners" with the great winning rifles of the Creedmoor Long Island International Matches.

The falling block design of Christian Sharps revolutionized the breechloader of the day by providing a truly strong breech action for powerful cartridges. When the Sharps was first used in the Civil War by Col. Berdan's Sharpshooters, the system was outstanding in providing rapid reloading for the relatively weak rimfire and paper or linen-wrapped Civil War cartridges. The inherent strength of the basic action wasn't required for such low-powered rounds, but it was in the design, and with the move to centerfire cartridges it became obvious that the Sharps action was born to handle powerful fodder. The design was to spawn an entire generation of falling blocks, which can be traced from the original Sharps action right up to the fine Ruger No. 1 of today.

The powerful Sharps rifles and cartridges, however, were not part of the mainstream of rifle and cartridge choices among the Western pioneers or their Eastern seaboard relatives. Winchester became syn-

Using the common tactic of working from a stand, the "runner" at right prepares for a long shot with his .45-70 Sharps as he eyes the herd for a target.

onymous with repeating rifles during the Seventies. For feeding in the tubular magazines of the Model '73 or '76 rifles, the cartridges were either revolver-type rounds as for the '73, or longer, more powerful "express" cartridges for the '76. All used the flat-nosed bullets required for safe and reliable functioning in a tubular magazine. Even the larger cartridges for the '76, such as the .45-75 with its 350-grain bullet at 1,383 fps, were short range affairs because of their short bullets. Both the shape (flat-nosed) and the light weight-for-caliber of these tubular magazine rifle cartridges made them almost useless for such massive game as bison (buffalo) and marginal for grizzly, elk and moose. Unfortunately, the effect on many shooters of a rifle which is "loaded on Sunday and fired all week" worked in the direction of poor shooting, since there was usually always another shot in the tube. In mitigation of the black powder Winchester and similar tubular magazine repeaters for short or weak cartridges, it should be remembered that the main purpose of such rifles was paramilitary, or self-defense against marauding Indians or bandits where settlers were isolated and forced to protect themselves and often their families alone, with no phone to call the SWAT team or the militia. These frontiersmen needed all the firepower they could get, and that usually depended on the products of two companies, Colt and Winchester.

The Sharps Company introduced its "Big .50," the famous 2½-inch case .50-90, around 1872/3 during the heyday of buffalo hunting as a more powerful alternative to the immensely popular and effective .50-70 Springfield and Remington. It, like other Sharps cartridges, had other designations such as .50-100 and .50-110, depending on the load. However, it was the .50-90 that was the true "Big Fifty" and not the great .50 3¼-inch, also known as the .50-140-700, which was introduced in 1880, a year prior to the collapse of the Sharps company. The term "Big Fifty" arose in the Seventies, well before the advent of the .50-140-700, but many otherwise knowledgeable writers persist in applying it to the later round.

I would say that the great buffalo Sharps rifles and calibers resulted more from the Creedmoor influence than from any sudden marketing opportunity created by the hide hunters. It was the Eastern seaboard and international interest in long range rifle shooting such as was conducted at Creedmoor, Long Island which inspired the .45-120-550 and other Sharps long range cartridges and rifles. In 1876 Sharps Creedmoor rifles won the matches against 40 competitors using the rifles of six manufacturers. The following year the Sharps at the International Match averaged 420 points per man against 414 by the best competitor. At the NRA 1878 fall meet at Creedmoor, the Sharps Creedmoor took 12 out of 16 matches. The national teams of Ireland, Scotland, Australia and Canada were defeated in the 1876 matches, and according to W.W. Greener, "Some of the finest shooting ever recorded was made in 1877, both in this country (England) and the United States. The American teams (armed with Sharps Creedmoors) defeated those of the United Kingdom, and the superiority of the American system of rifle shooting, the superiority of the cleansable and cleansed breechloader over the increasing fouling of the muzzleloader was demonstrated beyond question."

In the waning days of the buffalo "runner," there on the Great Plains with little or no cover, the rifles and cartridges that defeated the British teams caught the attention of advanced riflemen among the "runners." The Sharps rifle had already attained a fine reputation for accuracy and reliability among the hide hunters, but the appearance on the plains of such sophisticated equipment with Vernier and sometimes full-length telescope sights was a shock to those old-timers whose idea of a set of sights was a crude rear notch and a front blade.

Alfred M. Mayer was such a rifleman-hunter of the 1870s who survived into the ultra-high velocity era. His first Sharps was

The hunters below demonstrate typical supported shooting positions as they aim their Spencer military (top) and Sharps sporter rifles with professional skill.

In addition to the commercial ammo, availability of factory primed cases offered a "home brewed" option to the savvy hunter who preferred to tailor his loads to his favorite buffalo gun.

bought from his friend, Col. Richard I. Dodge, for $125. It was a .40-90-320 with a 32-inch barrel and it weighed 12 pounds with its Vollmer 20-power scope. Mayer added upper and lower stadia wires to his crosshair reticle for range estimation and for quick elevation. The space between the stadia covered 30 inches at 200 yards. Mayer subsequently purchased two more Sharps, a .40-70-320 and a .40-90-420; both used bottlenecked cases. According to Mayer, the bottlenecked cases caused problems in extraction, which is understandable in view of their higher pressure than straight-tapered cases and the poor brass then used. Mayer needed more power to bring down the big bovines at long range with a single shot so he obtained a "Special Old Reliable Buffalo Sharps" in the unprecedented power of the .45-120-550 caliber. According to Mayer, "I paid $237.60 for mine, a specially made rifle equipped with a 20-power scope. But it was a *rifle.*" Mayer's last rifle was one of the new (1937) Model 70 Winchesters in .270 Winchester caliber.

Col. W.D. Pickett was another such advanced rifleman, a Confederate veteran who settled in Wyoming in 1876. Pickett favored the .45-120-550 but experimented with lighter bullets of his own design, such as a 340-grain conical which, with 110 grains of powder, chronographed at 1,830 fps. Pickett was a black powder counterpart of today's wildcatters and handloaders. His conclusion was, "Later experience has convinced me that the 340-grain Express ball is sufficient for all large game of the continent. For great beasts like the Buffalo, a heavy solid bullet is the thing, but during the season of 1881, after I had become familiar with the habits of grizzly bear, I killed, using the Express bullet and 110 grains of black powder, 23 grizzlies of which 17 required only a single shot."

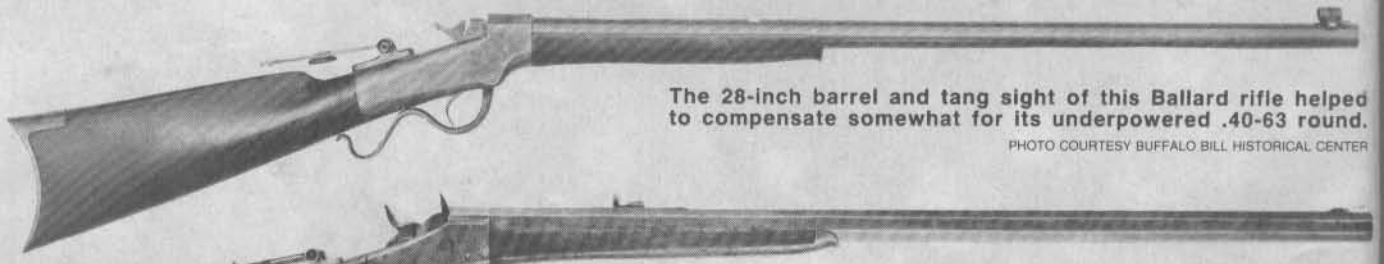
Teddy Roosevelt was also a Sharps user, but Teddy was not a robust man in his early years. He also had a .500 English double express, but he discarded them because, "Both of these, especially the latter, had a vicious recoil. I threw them both aside and have instead a .40-90 Sharps for very long range work; a .50-115, six-shot Bullard express which has the velocity, shock and low trajectory of the English gun, and better than either, a .45-75 half-magazine Winchester ('76)."

"Teddy" used his .45-75 well, and as he was uncontestably a woodsman and a fine hunter, he could stalk closely for maximizing the relatively weak .45-75's effect. It was even then regarded as being on the light side for grizzly, elk and moose with its 350-grain bullet at 1,383 fps.

W.H. Wright, the late 19th century grizzly hunter, guide and photographer of Montana, used an unusually powerful Winchester single-shot which was specially made for him as he recounts.

"I was then using my single-shot rifle made to order for me by the Winchester people; the .45-100 in which I shot 100 grains of powder and 600 grains of lead. It was one of the guns that killed at both ends, but I liked it better than any I have ever carried. Personally, I could depend on this rifle for a sure three shots in 12 seconds, by holding two spare cartridges between the fingers of my right hand, and I have always thought that a hunter is apt to be much more careful if he knows that every shot must tell. I always got as close to the game as I could before shooting, and whatever I shot, it generally dropped if hit, and I was usually near enough to be sure of hitting." Wright's .45-100-600 cartridge must have been the .45-100 Sharps 2⅞-inch round with a special bullet since no such round was among Winchester's factory cartridges.

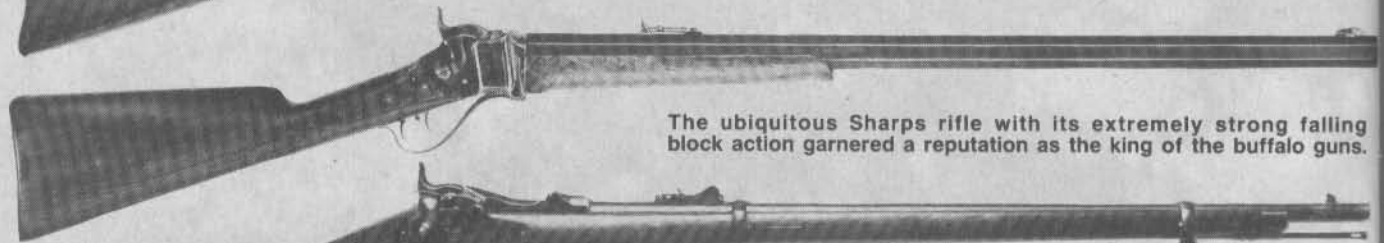
The Sharps .50-90 fired a 473-grain paper-patched bullet at 1,350 fps and a light bullet of 335 grains at 1,475 fps. It wasn't too much of an improvement over its competition, the .50-70 Gov't. Before it reorganized in 1876, Sharps produced the .44-90-520, also known as the .44-100 and the .44-105. It fired a 520-grain paper-patched lead bullet at 1,270 fps. Similar Creedmoor-type .44 caliber cartridges were introduced by Remington, Ballard, Peabody and Wesson for their long range single-shots, which were also used by some buffalo hunters. These .44 caliber cartridges, however, were not regarded as sufficiently



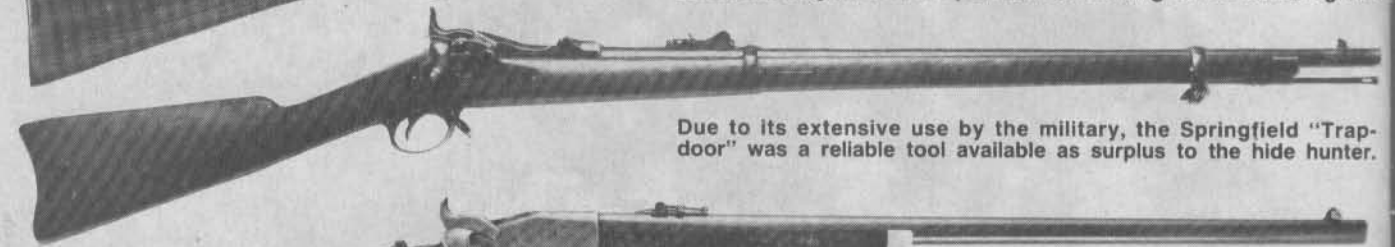
The 28-inch barrel and tang sight of this Ballard rifle helped to compensate somewhat for its underpowered .40-63 round.

PHOTO COURTESY BUFFALO BILL HISTORICAL CENTER

The strength and simplicity of the rolling block action accounted for the Remington's popularity among the professional hunters.



The ubiquitous Sharps rifle with its extremely strong falling block action garnered a reputation as the king of the buffalo guns.



Due to its extensive use by the military, the Springfield "Trapdoor" was a reliable tool available as surplus to the hide hunter.

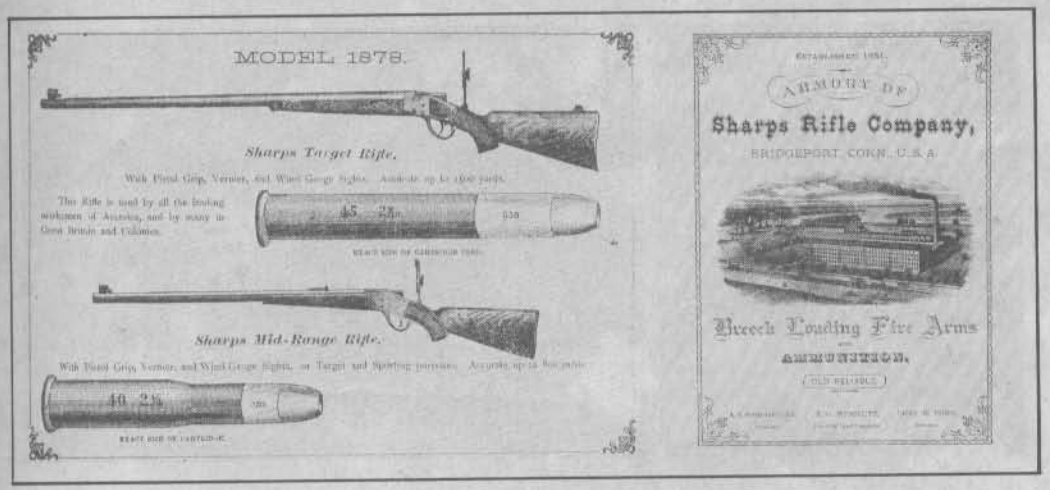
The Spencer rifle, once popular for its multiple-shot capability, lost favor due to its inability to accept a powerful cartridge.

powerful on the Plains, so Sharps went to their straight cased .45-100-550, 2⅛-inch case round with a velocity of 1,360 fps, introduced in 1876.

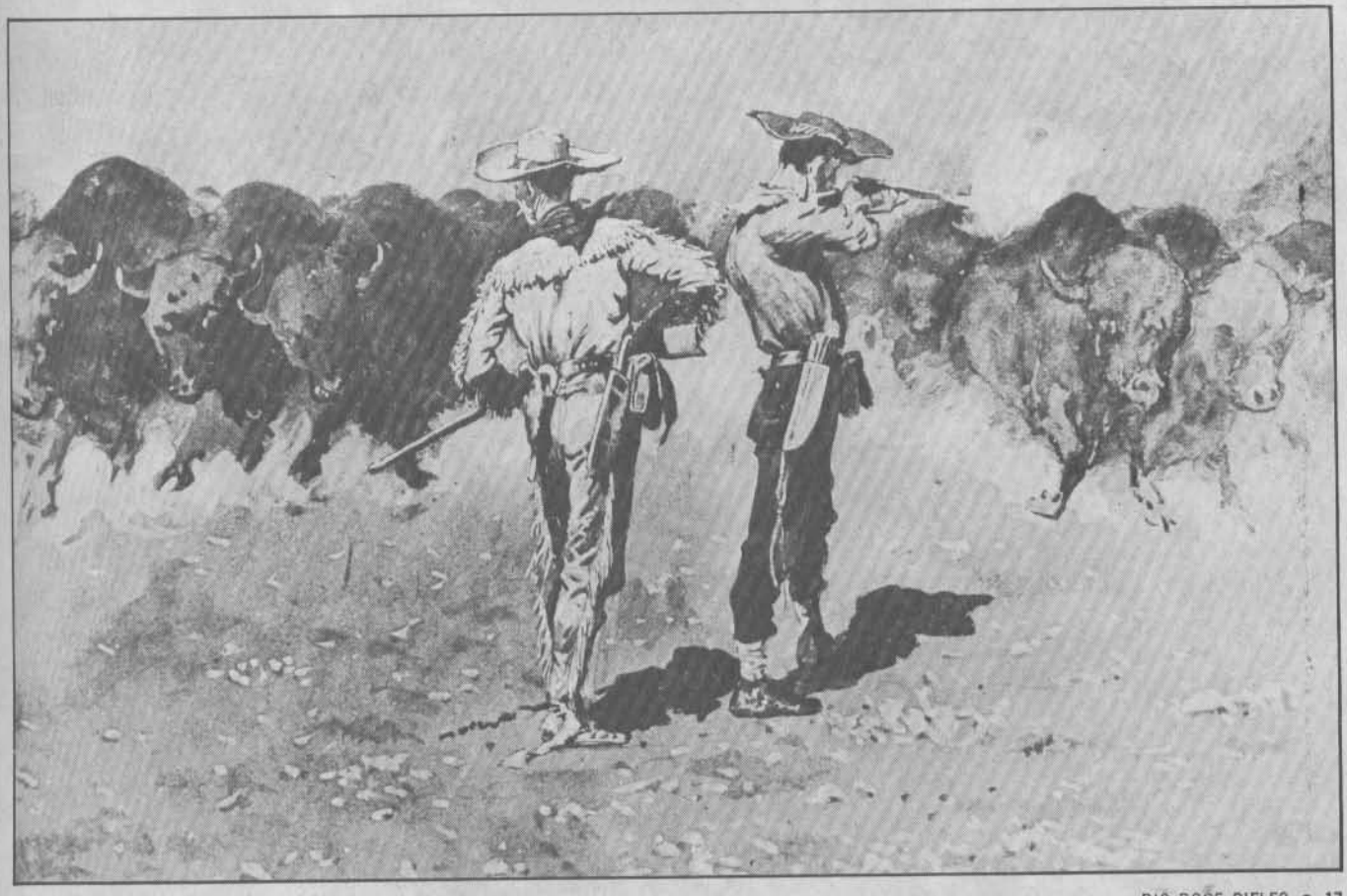
The bottlenecked cases were phased out in favor of a long, straight-tapered case which gave longer case life and fewer extraction problems. By 1878 the .44-100-520 Creedmoor cartridge was discontinued and a new Sharps buffalo round, the great .45-120-550 3¼-inch, set a new standard of power and excellence on the plains. Its velocity was 1,520 fps, and it represents the most advanced specifically buffalo cartridge produced by Sharps prior to the end of the buffalo hunting era around 1880. Winchester experimented with a 650-grain paper-patched bullet for this .45-120 3¼-inch round. Such calibers when used with 32-inch barreled Sharps rifles with Vernier target sights or telescope sights captured the imagination of riflemen and collectors as almost "legendary" rifles of equally legendary breed of American frontiersman. Had the Sharps cartridges used English Curtis & Harvey black powder, they would have been even more formidable long range calibers. According to the late Col. Townsend Whelen in his 1945 book, *Small Arms Design and Ballistics,* "In attaining these higher velocities (as much as 1,900 fps), the British makers were helped by their superior black powder. Their Curtis & Harvey No. 6 black powder was a very clean burning powder of such strength that 90 grains of it would give the same velocity to a bullet as 120 grains of the usual American Fg black powder."

Unfortunately for most shooters of Creedmoor or Buffalo Sharps rifles, the rifle and cartridge ballistics of such then-advanced equipment were often wasted at long range, despite flatter than normal trajectory, since as the range increased over 150 yards, a misjudging by as little as 50 yards or less could result in a miss or a wounded animal.

This problem apparently was not a deterrent to the long range shooting of a select few marksmen on the plains, as the incident at the Adobe Walls trading post on the *Llano Estacado* (Staked Plains) of the Texas Panhandle, June 27th, 1874 shows. Among the 28 men and one woman (mostly "runners") was a "runner" named Billy Dixon, who had a reputation among the other hunters as an excellent shot. Surrounding the trading post were between 700 and 1,000 Comanches, Cheyennes and Kiowas under Chief Quanah Parker. Dix-



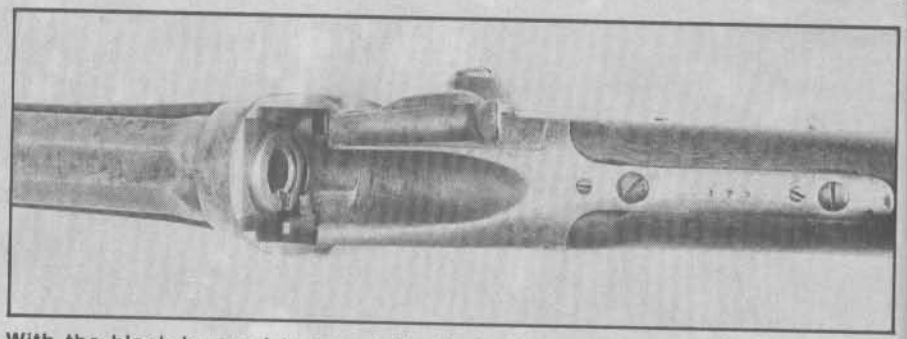
The buffalo hunter's professional requirements for an exceptionally accurate rifle spawned an entire generation of guns that were as much at home on the target range as they were on the plains. The Model 1878 Sharps, illustrated in a contemporary catalog at left, is characteristic of this high water mark in the buffalo gun's evolution. As the herds thinned, the hunter's tactics became more dependent upon well-placed long range shots. Though dramatic, Remington's painting, "Splitting The Herd," (below) is more fanciful than realistic.



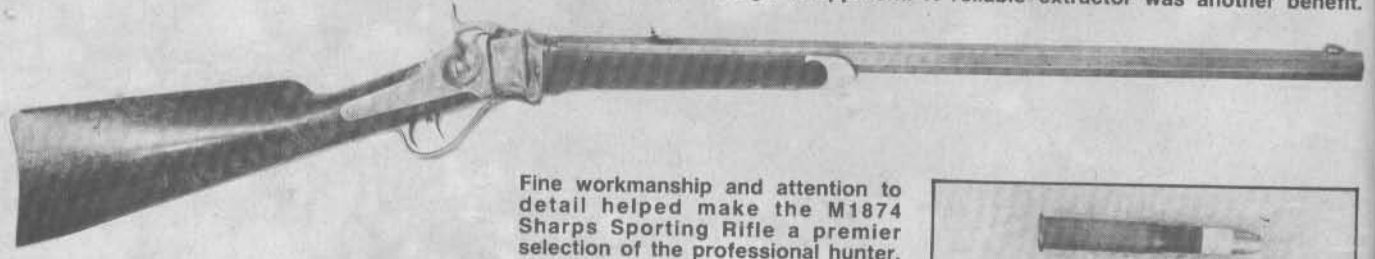
on shot one of Parker's braves at a measured range of 1,538 yards. With Dixon at Adobe Walls was another buffalo "runner" named "Bat" Masterson, who subsequently attained fame as the famous frontier marshal and gunfighter.

The king of the Sharps buffalo cartridges was the .50-140-700, which with its velocity of 1,355 fps and 2,850 ft. lbs. energy represented the ultimate in long range buffalo cartridges in wind bucking and the sledgehammer smash of its great 700-grain slug. Unfortunately, it arrived at the *finis* of commercial buffalo hunting, which coincided almost precisely with the folding of the Sharps Rifle Company in 1881. Buffalo hunting did continue in a reduced and intermittent way until about 1884, but by that time, such notable buffalo hunters as Pat Garrett, Bat Masterson and Bill Tilghman were busy with other activities and other quarry which, unlike buffalo, could shoot back! Tilghman, famous Oklahoma lawman and gunfighter, held a record for kills at 7,500! After a reliably estimated slaughter of some 12.5 million bison, extinction was a hair's breadth away, and General Phil Sheridan was right—with the vanishing of the buffalo from the Great Plains, so vanished the power of the Plains Indians to resist and impede the westward moving white juggernaut. Fortunately, enough bison survived in the Yellowstone area of Wyoming that, after it was declared a National Park around the turn of the century, this herd formed the nucleus of a species comeback that owes much to such great hunters as Theodore Roosevelt and other members of the Boone & Crockett Club. We now have huntable surplus populations of bison in many states, but the near-extinction of the American buffalo and the total extinction of the passenger pigeon provided our nation with a lesson that has saved and will save other species from a similar fate.

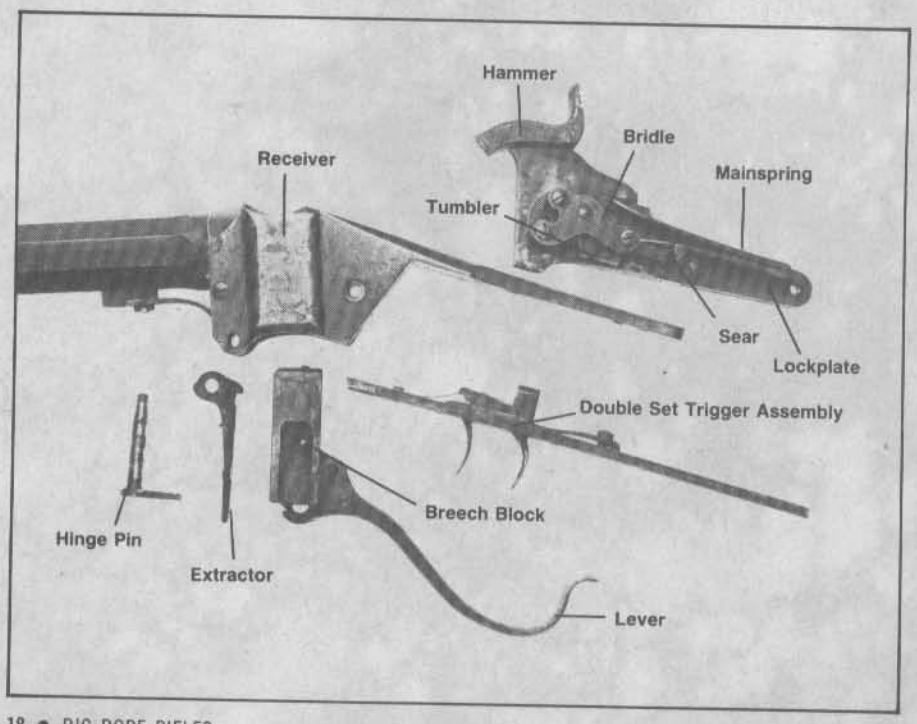
Sharps rifles are valuable collector's guns; those who own only a few original specimens have a considerable estate. *Guns & Ammo's* Executive Editor, Elmer Keith, who grew up with a Sharps as his regular hunting rifle, is a lifelong collector of these great falling blocks, as was the late Maurice C. Clarke of Beverly Hills, California, who grew up with Keith in Montana. Fortunately for the owners of original Sharps rifles and any of the various modern replicas on today's market, the Brass Extrusion Laboratories, Ltd. (B.E.L.L.) of Jim Bell, 800 W. Maple Lane, Bensenville, IL 60106, produce excellent Boxer primer pocket basic brass for most, if not all, metallic Sharps cartridges. These are in such basic cases as the RCBS .45 caliber 3¼-inch basic case which forms into the Sharps .40-90, .45-100 and .450-120 3¼-inch and B.E.L.L.'s .50 Sharps 3¼-inch basic case which forms into the .50-90, the .50-140 and other big .50 caliber cases. Huntington Die Specialties, P.O. Box 991, Oroville, CA 95965 can furnish dies and molds as well as B.E.L.L. and RCBS brass. Dave Cumberland, proprietor of "The Old Western Scrounger," 3509 Carlson Blvd., El Cerrito, CA 94530, can furnish, among



With the block lowered to reveal the feed ramp and chamber mouth, the simplicity of the Sharps design is apparent. A reliable extractor was another benefit.



Fine workmanship and attention to detail helped make the M1874 Sharps Sporting Rifle a premier selection of the professional hunter.



The legendary Sharps accuracy was due, in part, to such features as paper patched bullets, vernier tang sights and double set triggers (above). "Old Reliable" was favored for its efficiency of operation, whether it be a working gun or a Creedmoor tack-driver. The secret to its reliability is disclosed in the hefty, uncomplicated lock illustrated at left.

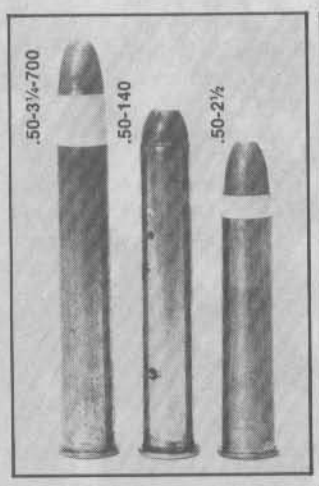
sundry other items, Pyrodex-loaded fresh ammo with new cases for the .45-100-550, .45-120-550 and the great .50-140-600, which is interchangeable with the original .50-140-700. Sharps rifles and cartridges never seem to die. The current crop of well-made replica Sharps rifles makes the experience once known only to buffalo hunters and collectors available to all.

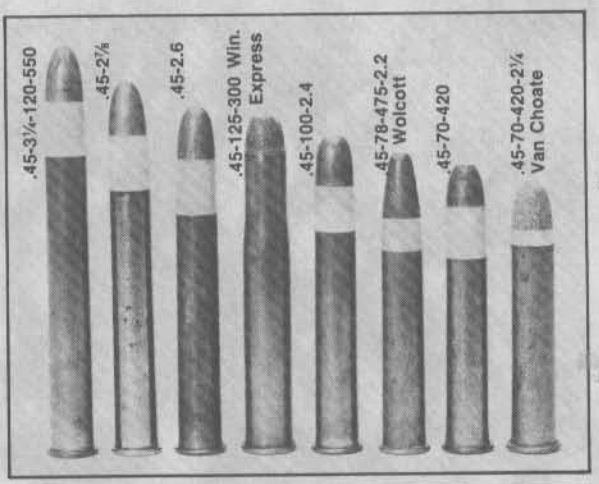
Winchester also belongs in this discussion of American big bores since it introduced the largest caliber sporting cartridge of all, the .70-150 with its necked down 12 gauge bottlenecked case. It was for a rifle on the Model 1887 lever action shotgun action with a tubular magazine and surfaced in 1888, then soon vanished from sight as one of those oddities with no functional or commercial value aside from being a promotional freak. Winchester did market successfully their .50-110 cartridge for the Model 1886. It used a 300-grain flat-nosed bullet which, with black powder, attained 1,605 fps. The little-known smokeless load reached 2,242 fps and had 3,349 ft. lbs. of energy. I saw one .50-110 Model 86 in Bulawayo, Rhodesia, a rifle taken out to Afri-

PHOTO COURTESY S. DAKOTA STATE HISTORICAL SOCIETY

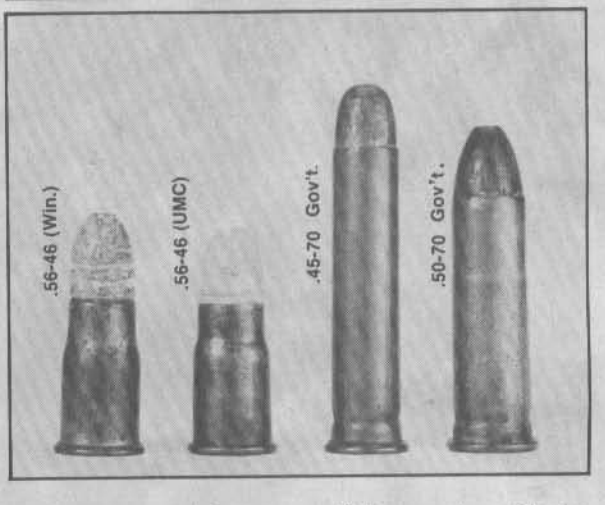
The "buffalo gun" was used by sportsmen as well as hide hunters. George A. Custer grasps the octagonal barrel of one he used to bag this grizzly bear.

ca in the 1890s by a pioneer who probably was one of the many Americans who came in search of gold and land. The round had poor characteristics for the hunting of big game anywhere due to its low sectional density, but it merits a place in our list of American big bore cartridges due to its relative popularity and unusual size for a lever action, tubular magazine cartridge. Winchester's .50-140-473 for the Model 1885 Single Shot with its 3¼-inch case was better at 1,580 fps and 2,622 ft. lbs. of energy. Winchester also produced the huge .45-200-500 Sharpshooter experimental cartridge for Springfield Armory in 1884. It would still be a magnum today and was a freak among freaks with a very short neck.





The buffalo is a massive, thick-skinned animal requiring a potent cartridge with a heavy bullet. Each bullet fired cut into the hunter's profit, and this served to magnify the value of a one-shot, one-hide hunting technique. These factors contributed significantly to the immense popularity of the Sharps rifles, available for a myriad of cartridges in both .45 (above, right) and .50 calibers (above). The delicate workings of the Spencer repeater, on the other hand, limited its cartridges to types considered underpowered for buffalo (right).



Originally designed as a stop-gap for the military during its transition to breechloading arms, the "trapdoor" action became very popular with buffalo runners.

Winchester also loaded most Sharps cartridges, as did UMC.

Curiously, Ballard, popularly linked with Schuetzen single-shot rifles, also produced a genuine buffalo type cartridge of impressive power, the .45-100-550 Ballard. It is made on the .44-100-535 Ballard case. There were other cartridges in the buffalo and Creedmoor class, such as the .44-100-550 Remington, the .44-100-550 Wesson, the .44-95-550 Peabody "What Cheer" and others, and while the Sharps was king, all of these had their following amongst the buffalo "runners."

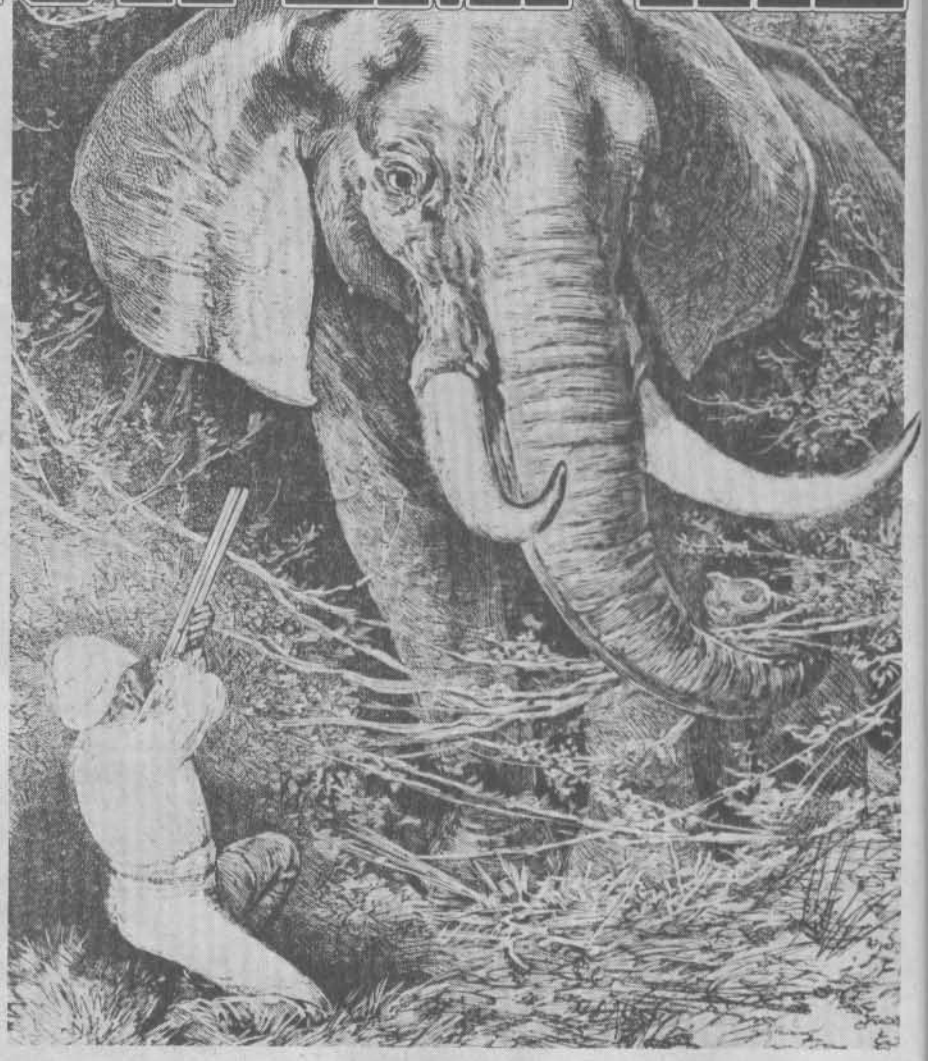
It is sometimes mentioned that such once ultra-efficient long range calibers were inspired by Britain's success with such long range Bisley rounds as Charles Metford's .461 No. 1. That the high grade British single-shot and double rifles in the big express calibers influenced our gun and cartridge makers is undeniable, but American black powder cartridges and their rifles dominated international long range shooting during the 19th century. The British led in the design and production of big bore cartridges and rifles for tropical dangerous game, and did perfect the single-shot beyond the level of the Sharps later in the century with their Farquharson and similar falling block actions. They also excelled in the design and making of fine double rifles, but the American gunmakers and cartridge makers set the pace, and as W.W. Greener and other great English gun authorities agreed, the lessons of Creedmoor, the Civil War and the Great Plains significantly influenced the London, Birmingham and Edinburgh gunmakers.

Pick up an old Buffalo Sharps and examine it and its cigar-sized cartridge. To most, the vision conjured up is of vast plains and milling herds of bison, surveyed by rough plainsmen with Sharps rifles—but the godfather of those rifles was Creedmoor. To this author, the Spartan metalwork, the no-nonsense functionality and lines bring to mind not only the vast herds of bison, but also musty old Eastern seaboard shops with overhead belt-driven machinery powered by water, and the remarkably skilled Yankee craftsmen who made it all possible.

CHAPTER 4

BIG BORES OF THE BRITISH EMPIRE

As the British spread their empire across the globe, monstrous black powder rifles accompanied them in pursuit of dangerous game.



The centerfire big bores of the 19th century, some of which survived commercially to 1920 and later, included not only the all-time biggest sporting cartridges, but also the most powerful in terms of energy. Such sporting calibers include the Kynoch 4-bore with 12 drams of black powder and an 1,882-grain conical bullet of hardened lead at 1,330 fps with 7,400 ft. lbs. of energy. Among factory big bores today, only the .460 Weatherby's energy at 8,095 ft. lbs. exceeds that of the 4-bore, and only by speeding up its 500-grain bullet to 2,700 fps. If you correctly regard the 4-bore and the .460 Weatherby as ultra-powerful and a bit more than is needed for North American game, consider the 2-bore rifle cartridge and its 3,500-grain (½-pound) round ball of hardened lead alloy at about 1,400 fps for a muzzle energy of 15,225 ft. lbs.—over *three times* the energy of the .458 Winchester Magnum! It may seem academic, but the 2-bore's energy reflects bullet weight more than velocity. To illustrate what I mean, if the 2-bore had twice as much velocity, or about that of the .460, its energy would go to 56,630 ft. lbs. or more than 10 times the energy of the .458! I'm not suggesting such a thing for practical reasons other than to show the effect of velocity on energy. Actually, the 2-bore wasn't a standard cartridge, which among shotgun gauge-designated rifle rounds stopped at 4-bore, but rifles as well as ammo were made for it and both were used by a few hardy souls for elephant and other large, dangerous game.

At .94 caliber (.935-inch), the 4-bore proved too big in a 20-pound or heavier rifle for all but the most powerful hunters. Even for such remarkable men it was too unwieldy in emergencies, and its enormous power, recoil and weight placed it in the realm of diminishing returns. It was the 8-bore which was the king of the working big bores of Victoria's reign, with the brass case conical rifle bullet weighing 1,250 grains and the round ball 875 grains. The paper case rifle used an .835-inch diameter conical bullet and ball because of the greater thickness of the paper case wall; the brass case bullet diameter is .875 (⅞-inch). The caliber was also available in Holland & Holland's "Paradox" ball and shotgun. The "Paradox" was the invention of England's Lt. Col. Fosbery, V.C., perhaps more famed abroad for the unusual Webley-Fosbery automatic revolver. It is best described as a double rifle which is "freebored" from the forcing cone to within around two inches of the muzzle where deep rifling engraves the bullet to stabilize it. The Paradox gave a higher velocity per caliber than a standard rifle due to the far lesser amount of rifling the bullet must traverse, but it was justly famed for accuracy. It had the advantage of a choice of shot or the heavy conical bullet, but it made a heavy shotgun in 8-bore. In 12 gauge it remained popular in Africa and tropical Asia for protection or back-up against the great cats and for an occasional small buck or bird for the pot. In calibers over 12-bore it was essentially an excellent double rifle. I

Glaring muzzles of the author's J.B. Rodda 8-bore double rifle are a graphic depiction of the gun's awesome power. No trick photography was necessary here!

The Rodda's impact is as impressive as its bore size. Here a heavy mass of Duxseal is jolted by a 1,300-grain conical with 10 drams of Fg black powder.

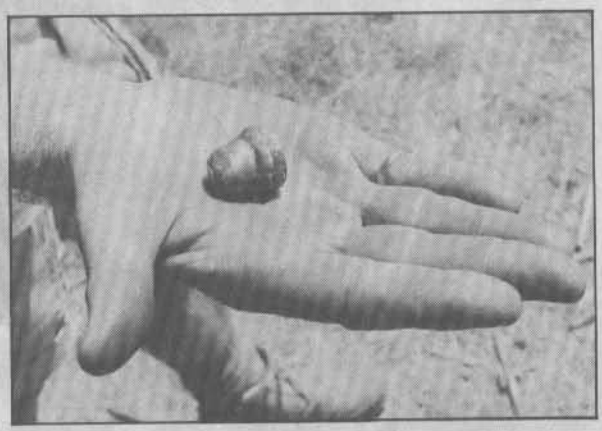
once owned the fine cased 10-bore Paradox Holland made for Lord Douglas Compton whose testimonial on its successful performance in India, where Compton was aide-de-camp to the Governor of Madras, graces my 1904 Holland catalog reprint. My shooting with it was abortive because I was ignorant of the fact that there are two sized versions of shotgun gauge rifle and Paradox cartridges—paper case and brass case. I had obtained some paper case 10-bore Paradox ammunition which, owing to the thicker paper case walls, uses a smaller diameter bullet than does the brass case round. The big 875-grain conical bullets mostly keyholed and went through the paper sideways.

The late John Taylor, the famed "Pondoro," professional hunter and author of *African Rifles & Cartridges, Pondoro* and other fine works on African big game hunting and rifles, recommended a 12-bore Paradox with its 750-grain solid lead bullet for leopard especially, "and a splendid thing to have handy in case of an attack on the camp at night."

Other firms jumped on the "Paradox" bandwagon, working around Col. Fosbery's patent, but furnishing functionally the same thing. Westley Richards called their version the "Explora" and furnished a "Magnum" version, which used their 735-grain "L-T" conical hollowcapped bullet at higher than standard 1,300 fps velocity. The "L-T" honors Westley Richards' onetime Managing Director, Leslie Taylor, who introduced the Explora and the "L-T" line of capped bullets, the .318 "Accelerated Express," the .425 Magnum, etc. soon after the turn of the century. W.J. Jeffery called their version the "Invisible Rifled Gun," one of which I owned in 12-bore. This was a fully-rifled 12-bore double rifle with shallow, radiused grooves and lands, scarcely visible to the eye. It cleaned like a shotgun, fired shot like a cylinder bore and stabilized a Paradox conical slug like a normal double rifle. Charles Lancaster of London called their version the "Colindian," and the popular Army & Navy Cooperative Stores, Ltd. called their version the "Jungle Gun." My "Jungle Gun" carries London proofs and is a superbly made Anson & Deeley boxlock 12-bore ball & shot gun for 750-grain Paradox ammunition. "Jungle Gun" rifling is full-length but runs straight from the forcing cone to within 2½ inches of the muzzle where it takes a twist. This system engraves the bullet and controls its entry into the twist, preventing tearing or stripping. It is the most accurate Paradox-type gun I have tested, with my first group making a single ragged hole for eight shots, left and right with the 800-grain conical bullet at 25 yards. It is cast from my 750-grain hollowpoint mold without using the hollowpoint plug.

The 12-bore Paradox concept was the only big game, big bore cartridge that was originally a black powder load to survive the change to smokeless because there was no competition which fired both shotshells and heavy bullets. The larger gauge Paradox guns did not survive after WWI since they were too heavy to serve as combination ball & shot guns in competition with the modern nitro-expresses. However, Holland & Holland listed their Royal Grade 12-bore Paradox in their 1950 catalog. Some few users of 12-bore Paradoxes and related designs either have a supply of original ammo or a bullet mold as I do. I use 2¾-inch brass cases with Boxer primers for mine, but many continue to use Paradox-type guns with shot and round ball or rifled slug loads such as the fine Brenneke slugs, and now the potent Federal 1¼-ounce magnum slug loading. These will rarely be as accurate as original Paradox slugs since their diameter will be smaller, but either the right barrel or the left can be sighted for them, and at under 20 yards both barrels will be close enough together in emergencies. In a sense, the rifled slug keeps the Paradox principle alive—not literally, but in function, and no better stopper has ever been devised for a charging leopard. The new 10-bore 1¾-ounce magnum slug loads are even more potent and bring the 10-bore back into its own again as a stopper for thin-skinned dangerous game at close range. The more things change, the more they remain the same!

From today's perspective, such gargantuan black powder cartridges as the 4-bore with its 1,882-grain bullet and the 8-bore with its 1,250-grain bullet seem grotesque and impractical. This is a natural reaction for generations raised in a tradition which



The 8-bore Rodda packs a mean wallop at both ends as is evidenced by the hefty recoil being experienced by the author (above) and the massive size of the 1,300-grain lead bullet recovered from the Duxseal (right). The load is 10 drams of Fg powder for a muzzle velocity of 1,400 fps.

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regarded a "big bore" as any rifle caliber over .30 caliber. Though not entirely accounting for the contrast between black powder big bore bullet diameters and those of smokeless "big bores" and their weights, muzzle energies do provide a clue. The most popular Victorian cartridge for red deer and similar-sized game of Britain was the .450 3¼-inch black powder express. With a 310-grain lead bullet at 1,800 fps velocity, this was the minimal standard red deer cartridge, a *small bore,* with 2,240 ft. lbs. of energy. The .303 British 215-grain factory load at 2,180 fps has a muzzle energy of 2,270 ft. lbs. In effect, it took a larger diameter and heavier bullet with black powder to produce similar energy (power) to a smokeless cartridge of the same power. Now let's take the 8-bore rifle with its 875-grain ball at 1,650 fps and its 1,250-grain conical bullet at 1,500 fps. It was *the* best stopper of the practical black powder elephant, rhino and buffalo calibers one could handle in an emergency. Gun weights ranged from 15 to 18 pounds; my 22-inch barreled R.B. Rodda double 8-bore brass case hammer rifle weighs 17 pounds. This was at the limits of portability and handiness, but manageable if carried by a gunbearer and taken over only at the end of a stalk or in an emergency. Today, the archetypical elephant caliber for double rifles is the .470 Nitro-Express, itself a nitro descendant of the .500 3¼-inch black powder express *small bore.* The .470 with its 500-grain bullet at 2,130 fps produces 5,030 ft. lbs. of muzzle energy, which puts it down as basic in power for the elephant and buffalo category. It should be noted that when Winchester designed the .458 Winchester Magnum, the idea was to duplicate .470 ballistics in a short belted case. The .470's energy counterpart in the late Victorian era was, of course, the 8-bore 875-grain round ball load at 1,650 fps, with its 5,285 ft. lbs. of muzzle energy! The empirical (practical) experience of generations of hunters with black powder elephant calibers and smokeless ones has born out the fact that these cartridges are as closely matched in effectiveness on such game as is possible between black and smokeless powder.

Obviously, the .470 "expresses" its energy differently than does the 8-bore, despite both having close comparative energies. The wound channel of an 8-bore bullet is ⅞-inch in diameter even without any expansion, and with the hard alloy bullets used for elephant and buff there was little or no expansion. The .470 bullet is .475-inch in diameter, or just .025-inch under a half-inch. Despite both the 8-bore and the .470 being on a par in power, roughly speaking, there was a noticeable difference if a charge occurred, in respect to the comparative stopping powers. Those who hunted with 8-bores and then tried the .450, .465 or .470 Nitro-Expresses almost always agreed that despite about equal energy, the 8-bore had a considerable edge in stopping power during a charge. That was why so many professional hunters kept an 8-bore in reserve while they hunted with their lighter .470, etc., for the not unusual case where the .470 or .450 failed to stop. This held true up until about 1914, but others sought to combine the ultra-large bore stopping of the 8-bore and the .450 Nitro-Express or .470 in a single nitro caliber and went to the .577 or the .600. The .577 with its 750-grain solid at 2,050 fps and 7,020 ft. lbs. of energy and the .600 with its 900-grain solid, 1,950 fps velocity and 7,610 ft. lbs. of energy were the only nitro-expresses to effectively exceed the old 8-bore and 4-bore in stopping power. The consensus of hunters with experience in both black powder and cordite big bores is that the advantages of such typical cordite elephant rounds as the .450 and the .470 were that the guns were lighter (10 to 11 pounds) compared to the 8-bore's 15 to 18 pounds, much less recoil and the absence of clouds of dense smoke. Taking the frontal area of an 8-bore bullet into consideration when combined with relatively high velocity and deep penetration with hard lead alloy or steel-nosed bullets, the reason for the 8-bore's extra measure of stopping power becomes clear. The power of the .450 and .470 class of nitro-expresses was, however, very adequate for elephant, and penetration on brain shots was more dependable with the jacketed solids of the cordite calibers, despite something of a lesser stopping power. Taking all into consideration, the advantages of the cordite big bores were such that the great black powder ultras quickly lapsed into an honorable retirement with few exceptions. The liberation from smoke, great gun weight and recoil was proclaimed by such black powder

A typical working 8-bore is this J.B. Rodda back action hammer double rifle. This specimen features the underlever screw grip system and sports 22-inch .875 barrels. Built circa 1885, this 17 pound workhorse chambers brass cases.

The 12-bore "Jungle Gun" was a proprietary patent of Army & Navy Cooperative Stores, manufactured by Webley & Scott. From a bench the recoil is considerable from the 800-gr. Paradox load of 5 drams of Fg. The rifling only twists 2½ inches from the muzzle to increase stability.

This "Jungle Gun" has a unique "doll's head" third fastener extending from the rib. The author loads an 800-gr. conical bullet housed in a 12 ga. brass case.

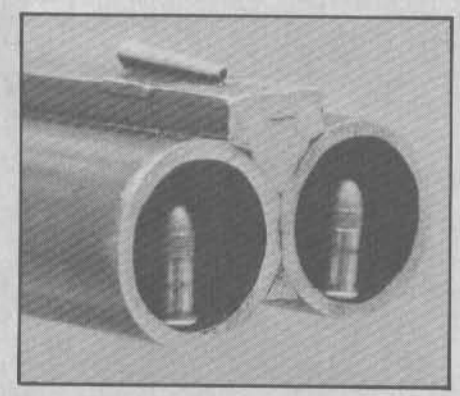
Largest of the big game doubles is the 4-bore. The Belgian-made Courtney 4-bore is a fine example with its back-action sidelocks, rebounding hammers.

greats as F.C. Selous and Arthur Neumann who tried the .450 Nitro-Express after its introduction by Rigby in 1897. Both men agreed that had they been armed with nitro calibers in their heydays, their bags would have been doubled.

To get the perspective of those hardy nimrods of the turn of the century and just after, when ultra-large bore black powder rifles were still considered essential for certain stopping power when charged by a determined elephant or buffalo, let us listen to their words.

The following incident as related in Col. F.T. Pollok's and W.S. Thom's 1900 classic *Wild Sports of Burma and Assam*, provides the most dramatic illustration of why the top British big game hunters of that era regarded anything less than an 8-bore inadequate for heavy, dangerous game:

" Many sportsmen have, I have no doubt, been fairly successful with small bores, but one day in thick cover with a charging gaur, bull elephant, or tsine (banteng) in his immediate front, he will discover his mistake. An article in the Field *of September 10, 1898, entitled 'Jungle Experience in Pahang,' gives a very good instance of how an experienced sportsman, Captain Syers, Commissioner of Police for the Federated Malay States, lost his life through having*

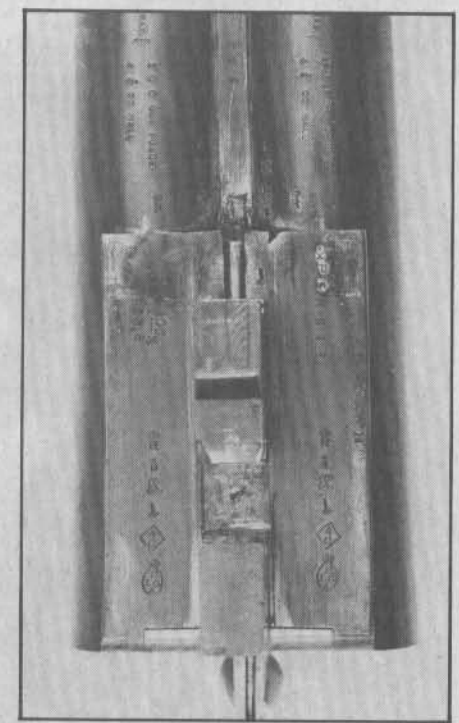


The .22 cal. Shorts are "swallowed" by this 4-bore behemoth. These cavernous barrels mike out at .935-inch, and that qualifies as a "big bore" by any standard!

pinned his faith to a .577 express (black powder) *double rifle. I shall here quote an extract from the above article for the benefit of those sportsmen who may still be of the same opinion with regard to a .577 and other small bores upon huge and dangerous game, who may not have seen the publication. 'I landed here at a grass plain on the river bank, and found eleven bison (gaur) and a calf feeding. I went back to the boats and informed Syers. He was armed with a .577 express, and on his recommendation I carried a similar weapon, leaving my 10-bore in the boat. We started the bull through the grass about five feet high, and we both gave him the contents of both barrels; he made off at a terrific pace into the jungle. The remainder of the herd cantered past slowly, and we managed to put the contents of another two barrels each into a cow as she passed us. She ran into a patch of undergrowth, where Syers finished her. In the meantime my Malay tracker, Awang, came up with my 10-bore, but stupidly only brought two cartridges. We then proceeded to follow the wounded bull. We tracked for three hours, when we unexpectedly heard a bison stamping, knocking off the flies from his legs. We made for the spot from which the noise proceeded, and came across a fresh bull in big jungle. He was about 30 yards from us, and we agreed to fire simultaneously. I gave him both barrels of my 10-bore and Syers both barrels from his .577 double.*

'The beast bolted; we followed up, and about a half-hour afterwards heard him moving in the jungle ahead. We made a detour, but the bull had been watching us and charged Syers, who gave him one barrel, turning him; he again charged, and Syers gave him his left barrel; the bull, on receiving the bullet, reared clear on his hind legs and dashed past at an angle. He then made for me, and I gave him both barrels from my .577, having meanwhile given my 10-bore to Awang, as I had no more cartridges for it. All these shots had taken effect, but the bull was not disabled. Syers used a .577 express throughout. The bull went on for about 300 yards and then waited for us; as we came up to him he again charged at a terrific pace. I heard him coming and stepped aside; Syers waited for him, and fired his first barrel at a distance of 20 yards, and his second at only two yards. Neither shot turned him, and the bull caught him clean in the back, rearing up into the air with him. Poor Syers, still clutching his rifle, turned three complete somersaults before his head struck the branch of a tree some 35 feet from the ground. He fell straight down on his back. The bull 'til now had not touched him with his horns, but waiting for him the moment he touched the ground again, tossed him with this right horn, the horn penetrating below his ribs in the right-hand side. I was close at hand, and fired two simultaneous shots, not even putting the rifle to my shoulder, and was knocked endways. All this occurred in a few seconds, and I had been unable to put in a shot sooner. The bull left the spot and lay down in the undergrowth close by, kicking and bellowing where he lay. I went at once to Syers' assistance, and found him terribly injured; the lining of the stomach protruding from the wound in his right side.

'At Syers' urgent request I returned to despatch the bull, leaving him in the care of his old servant, Yacoob. I had some difficulty in finding the spot where the bison was lying, but on finding him, I stalked up close.



Proofmarks abound on the barrel flats of a Courtney 4-bore. The Belgian proofs are joined by nitro-proofs of 100 grains of Schultz powder with a 4¼-oz. ball.

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He tried to rise but was unable to do so. I gave him five shots before he was finished. I counted 15 bullet wounds, mostly on the shoulders, some of them penetrating clean through the body.'"

Syers died 11½ hours later under sedation with opium. The muscles on the right side of this back . . . *"were completely torn away from the spine. Apart from his internal injuries, which were extremely serious, the doctor was surprised that Syers should have lived so long as 11½ hours. Syers was a firm believer in the .577 express and had shot no less than 13 bison, but told me, shortly before he expired, that if he had been armed with an 8-bore, the bull, in his last charge, would have been stopped; and earnestly entreated me never to go after bison again with so small a weapon. With this sad experience before me, it is needless to add that in the future I will follow out this last advice of the best sportsman who ever breathed."*

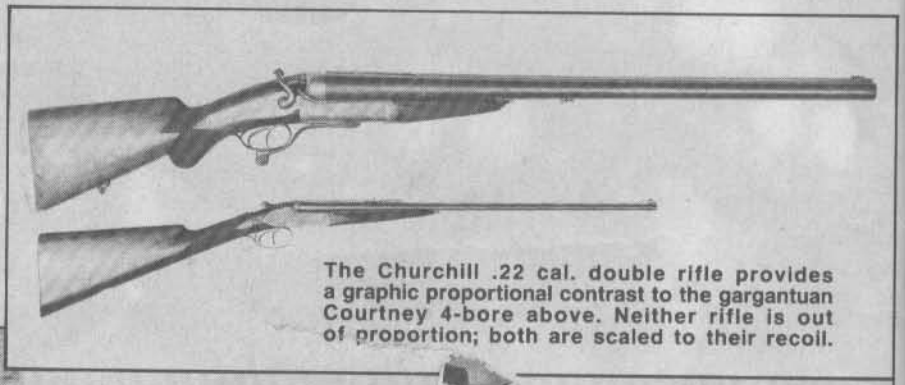
In 1894 Sir Frederick Jackson, the first Governor of British East Africa, in the Badminton Library of Sport, Volume One, related his experience during a buffalo hunt on the Turkwell River, December 14, 1889.

"I immediately walked straight up to the ant heap, on top of which was a large leafless bush, and on crawling up the side of the heap I saw the buffalo within five yards of me. Just at the moment he turned his head, and seeing me, stood up, had a look at me, and turned to bolt, but before he had got many yards I knocked him over all in a heap with an 8-bore bullet (1,250 grains) which raked him from stem to stern . . . But perhaps I owe my safety principally to my having had the good luck always to see the beast before or at the same time that it saw me, when I have at once saluted it with a 4-bore or 8-bore bullet, which has knocked out of it whatever inclination it may have had to charge!"

Sir Frederick was undoubtedly objective in his observations, as was another great English hunter, R.C.F. Maugham, His Majesty's Consul-General at Beira, Portuguese East Africa (Mozambique). Writing soon after the turn of the century, Maugham gives his views on the subject.

"For some years I have used simply a double .303 hammerless made by Messrs. Holland & Holland, and a double .500 express, these backed by a 10-bore Paradox; but I have recently substituted a double 8-bore rifle for the latter, throwing a bullet of 1,164 grains propelled by 10 drams of black powder. I am well aware that my adherence to this comparatively old-fashioned weapon

The author demonstrates a modified off-hand rest with his 4-bore Courtney dbl. rifle. An actual working elephant gun, this early 1900s example weighs 22 lbs.!



The Churchill .22 cal. double rifle provides a graphic proportional contrast to the gargantuan Courtney 4-bore above. Neither rifle is out of proportion; both are scaled to their recoil.

A solid shooting position ensures the best accuracy with a big bore. Two bull's-eyes were scored at 25 yards by Robert E. Petersen, PPC Chairman of the Board.

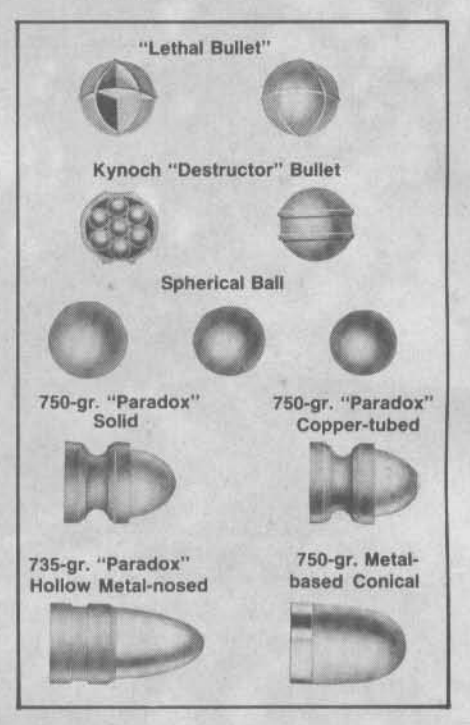
may perhaps lay me open to a great deal of criticism, but only those who have been the object of a determined charge from a furious beast can realize the sense of security which the possession of a powerful rifle *produces. With all its perfection, however, with its ideally low trajectory, admirable precision, and immense stopping power, no hunter in his right senses should place his blind trust in such a weapon as even the* .450 cordite rifle *to extricate him from the thousand and one dangers by which he is liable from day to day to be confronted in Africa. I therefore unhesitatingly advocate, in addition to the most perfected type of modern high velocity weapon which we are ever likely to see, the inclusion of a sound, heavy rifle intended for use at close range, the shock of whose bullet, even if it should not instantly kill, will assuredly be sufficiently great to disable or turn a charging beast. For those who do not possess the strength to use a heavy 8-bore, which I look upon as the ideal weapon par excellence for this purpose, I would suggest the adoption of a 10 or at least of a 12-bore Paradox throwing a 1¾-ounce bullet, driven by a charge of five drams of black powder. This, in capable hands, should be sufficiently powerful to produce the desired stopping effect."*

Maugham tells of the performance of his 8-bore on Cape buffalo:

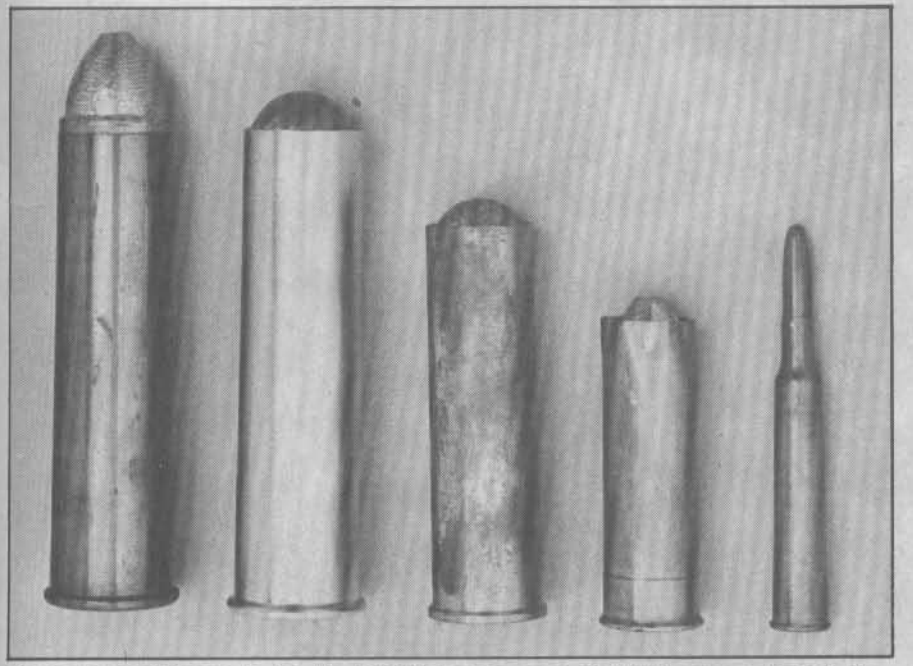
"I had selected the 8-bore rifle, as I was unwilling to run any risk of losing so fine a specimen, and at length, in an elan *of that uncontrollable excitement which has proved the undoing of so many, he finally turned his flank towards me and died on the spot. The terrific blow from the heavy 1,164-grain bullet* simply blew him over *and knocked him out at once! I subsequently found that it had crashed through the lower edge of the shoulder blade, passed completely through the middle of the heart, and thence taking an upward direction, had smashed its way through the furthest shoulder, which was* splintered to atoms, *and lodged under the thick hide of the forward portion of the flank!"*

The only black powder big bore to survive the transition to smokeless was Col. Fosbery's "Paradox" design, shown here in a 1910 Holland & Holland catalogue. The nitro version of the "Paradox" retained its popularity well into the 1950s.

Charles Lancaster's "Colindian" double rifle was a take-off of the "Paradox"-type big bore with the unique muzzle-tip twist—but would also fire shot loads.



A big bore bullet sampling is displayed above. This selection shows the variety of types available for use in "Paradox" guns, double rifles and normal shotguns.



Big bore cartridges (L to R): 8-bore brass case w/1,250 gr. conical bullet; 8-bore brass case w/875-gr. round ball; 10-bore brass case w/700-gr. round ball; 12-bore "Paradox" w/750 gr. conical HP and a 7 mm rifle cartridge.

There is nothing more I can add to these statements by three of the most experienced and factual big game hunters of those days of illustrate the incredible power of the black powder ultra-big bores.

The late Fred Davis, who until his untimely demise in an auto accident was the proprietor of the Davis Gun Shop of Falls Church, Virginia, owned and hunted with an 8-bore double rifle in Rhodesia. I have long wanted to hunt Cape buffalo with my 8-bore Rodda, a most accurate rifle with either the 875-grain ball or the 1,250-grain conical ahead of 10 to 12 drams of Fg. Its great power and nearly one-inch diameter bullets, with accuracy to match, leave no room for doubts about adequacy!

CHAPTER 5

THE ALL-AMERICAN BIG BORE REPEATER

Developed first for this continent's game and then for the whole world as American influence expanded, the U.S.-made production big bore is as good as you can find!

Like North American big game animals which, despite being related to certain European or Asiatic species, are distinctly American, North American big bore rifles and cartridges of the smokeless era evolved independently of their Old World counterparts. This held true from the days of the Pennsylvania flintlock, popularly mistermed the "Kentucky," which, though inspired by German flintlocks, can easily be distinguished from them. So it was that the first of our smokeless big bore rifles was in lever action guise. Surprisingly, the famed .405 Winchester Model 1895 wasn't our first smokeless big bore. The .405 was the first American big bore with a case designed for smokeless, but the honor belongs to the .50-110 WCF High-Velocity cartridge for the smokeless version

In wildcats and factory loads, magnums in the class of the .340 Wby. at right continue to prove their mettle in the American game fields. Many hunters prefer the added edge of a medium bore magnum to harvest moose or add a fine elk rack to the pack string.

PHOTO BY LEN RUE JR.

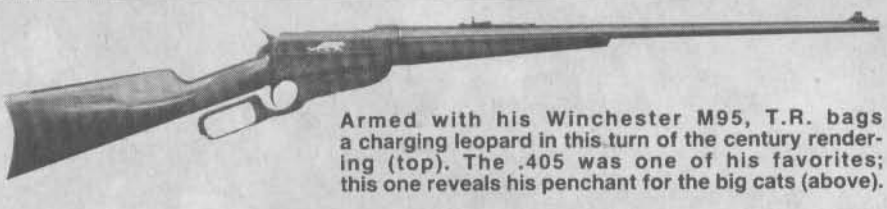
of the Winchester Model 1886. The .50-110 had been introduced as a black powder round in .512-inch caliber with a 300-grain flat-nosed bullet (for the tubular magazine) at 1,536 fps and energy of 1,571 ft. lbs. The .50-110 smokeless "High-Velocity" cartridge was not the usual smokeless equivalent of black powder ballistics but an entirely new and powerful load with a 300-grain jacketed bullet at 2,150 fps and 3,020 ft. lbs. energy—a nitro-express by any standard! Its bullet weight was too light by African or Indian standards, but it was designed for elk, grizzly and moose. Not remarkable by today's standards, it was a short-range powerhouse in those days.

The .50-110 High-Velocity never became popular because the .405, introduced in 1904 in the Model 1895 Winchester, was superior with its .412-inch, 300-grain cupro-nickel jacketed bullet at 2,200 fps and 3,220 ft. lbs. energy. Penetration with the .405 was superior to the 300-grain .45-90 WCF High-Velocity or the .50-110 High-Velocity thanks to better bullet shape, better bullet construction and sectional density. The Model 95's box magazine design did not require that bullet noses be flat to prevent recoil setting off the whole magazine, hence round noses and spitzers could be used.

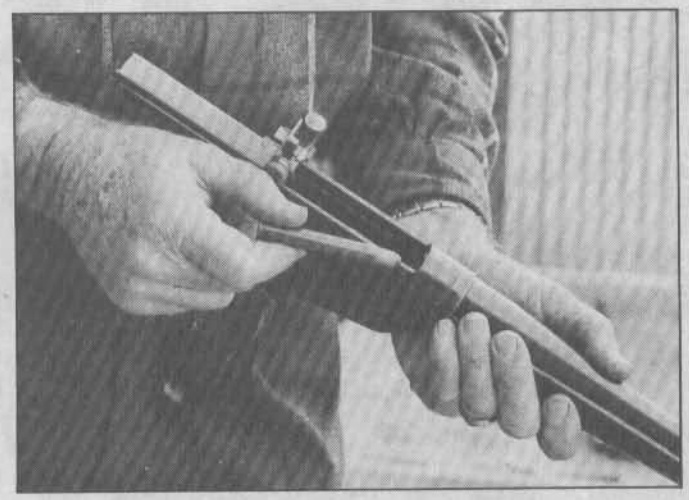
The Model 95, especially in .35 WCF and .405 WCF, was an instant sensation in the Northwest, Alaska and Canada for moose, grizzly and brown bear or elk. It was the .405 that really sold the Model 95 since no other American repeater offered such power. It wasn't a cartridge for over 150 yards, but within that range it was accurate, and within 100 yards it would break both shoulders of a grizzly or an elk. The fairly large caliber ensured a large entrance hole and good blood spoor for tracking—if a second shot was required, which if the first shot were decently placed, it seldom was.

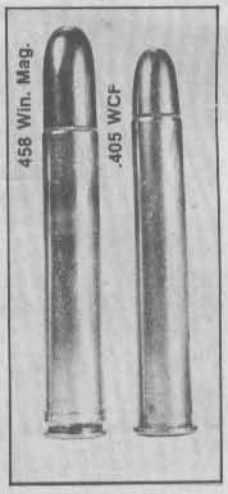
The .405 held the record for bore size combined with high velocity for a U.S. production rifle until Newton's .35 and .40 calibers arrived around World War I. The '95 and its .405 cartridge attracted the attention of President Theodore Roosevelt shortly before his 1909 African expedition. How this came about was disclosed during my historical research in the National Archives of Rhodesia in 1974. I learned that Roosevelt's letters to Captain Frederick Courtenay Selous, DSO, were in the archives, so I read every letter and learned of Selous' advice on how to arrange his safari by using a British guide, rather than to rely on African guides who could not speak English and lacked the equipment and capital required. Selous also advised on rifles and at the time was Britain's leading big game hunter-naturalist and field tester of newly designed rifles and cartridges. Selous was among a "Who's Who" list of prominent British big game hunters and naturalists who "chipped in" to purchase a Holland & Holland .500/.450 best quality sidelock ejector double rifle, presented to Roosevelt on the eve of his African expedition.

In an August 19, 1908 letter to Selous on White House stationery is the following: "I am much interested in your having heard from a man who used that .405 Winchester. I am taking one each for my son (Kermit) and myself, and I rather think it will be the rifle we shall mainly use. The other day a young Harvard fellow named Forbes, the cousin of our vice-governor in the Philippines, came out to see me. He is just back from East Africa where he hunt-



Armed with his Winchester M95, T.R. bags a charging leopard in this turn of the century rendering (top). The .405 was one of his favorites; this one reveals his penchant for the big cats (above).





Roosevelt's recipe for effective "lion medicine" was a Model 95 Winchester and a powerful .405 caliber cartridge. Though it was the most powerful American cartridge available to "Teddy" and his contemporaries, the .405 is vastly inferior to such modern leviathans as the .458 Win. Mag. (above right).

PHOTO BY JON CATES

A blockbuster load is definitely in order here! The grizzly is one of the largest, most dangerous animals in the U.S., and calls for the use of heavy ordnance.

ed last fall—since then he has spent several months in exploration. During the three months of his hunting he killed 13 lions, three elephants and five rhinos, three of the latter to protect his caravan, and one buffalo. For all of them he used the .405 Winchester. He took substantially your view of the rhino, by the way, except that he said that sometimes they were dangerous through sheer stupidity. I cannot really believe that I shall get either a lion or an elephant, but of course I shall try for them and I shall be amply contented if I get one of each."

"Forbes" was Gerrit Forbes, a longtime friend of Elmer Keith and an avid big game hunter, rifleman and handgunner. I crossed his trail in a Salisbury, Rhodesia gunshop in 1963 while on an extended hunting trip. Forbes came to Rhodesia to live, but when the government refused him permission to keep his handgun collection he packed up and returned to the United States.

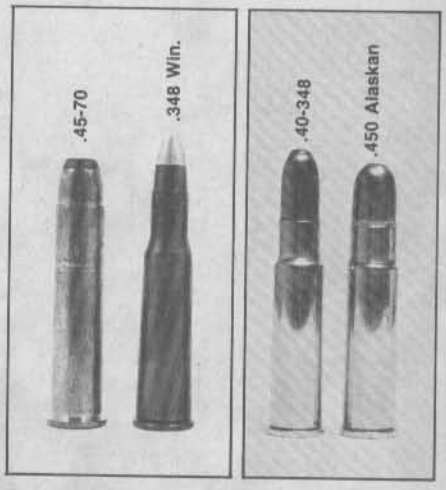
Roosevelt found his .405 to be a reliable and powerful rifle for thin-skinned game, commenting as follows in *African Game Trails:* "The Winchester and the Springfield (.30-06, Model 1903) were the weapons, one of which I always carried in my own hands, and for ordinary game I preferred them to any other rifles. The Winchester did admirably with lions, giraffes, elands and smaller game, and as will be seen, with hippos. For heavy game like rhinoceroses and buffaloes, I found that for me personally the heavy Holland was unquestionably the proper gun....Tarlton (guide Leslie Tarlton) took his big double barrel and advised me to take mine, as the sun had just set and it was likely to be close work, but I shook my head, for the Winchester .405 is, at least for me personally, the 'medicine gun' for lions." Roosevelt's remarks on his .405 as his "medicine gun" for lion stuck in the public's mind and sales of Model 95 .405s jumped to a new high.

Author Stewart Edward White, whom Roosevelt judged the finest shot to ever shoot at his private range at Sagamore Hill, followed in "T.R.'s" African footsteps. He recorded his views on the Model 95 .405 in his 1915 book, *The Rediscovered Country,* as follows: "For the second gun I used, as before, the .405 Winchester. It is light, handy, and delivers a very hard blow at close ranges. Beyond 150 yards, however, it loses velocity too fast to make it of the first use. It is a good brush gun, and has always done me well on lions. Its record was:

"Shots fired: 33; hits: 29; misses: four; animals shot at: 14; animals killed: 14."

Such enthusiastic testimonials from respected authorities not only boosted sales but became garbled into a general and incorrect view that the .405 was also an "elephant gun." A Dutch hunter named Lediboor who had used his .405 successfully on Sumatran rhino and the small elephants of that island was killed in the 1920s when he made the fatal error of trying his .405 on a Tanganyika elephant which took exception to Lediboor's choice of calibers and simply obliterated him—literally!

One of the most famous African guides of the Twenties was Charles "Bwana" Cottar, a giant Oklahoma frontiersman, said to have been a deadly gunslinger stateside, with an impressive string of "equalized" victims. Cottar was a superb hunter—and a resolute poacher—who, although he owned a .470 Rigby double rifle, retained the Westerner's love of lever action persuasion. Cottars' pet lever action and pet rifle were one and the same—a .405 Model 95. In 1940, after recovering from a stroke but still stronger than most men (Cottar had killed two leopards in one incident by banging their heads together after being attacked), Cottar and his two boys were out in the thorn to obtain lecture movies of a charging rhino. The boys left the Dodge truck and their father to follow a rhino's spoor. After hearing shots from the direction of the truck, they rushed back to find a dead bull rhino atop their father—the rhi-

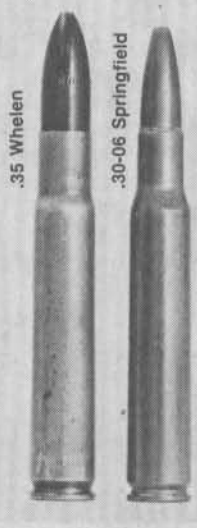


Big bore development saw the .45-70 give way to the .348 WCF which in turn spawned wildcats like the .40-348 and .450 Alaskan (r). These round-nosed bullets are unsafe for use in guns with tubular magazines.

The fine Winchester Model 71 descended from the revered M1886. It supplanted the Model 95, but its .348 cartridge couldn't match the old .405.

The wildcat .450 Alaskan conversion of the Winchester Model 71 enjoyed some popularity in Alaska and filled a gap left by the demise of the .405 Win.

Big game and thick vegetation call for a good brush gun in a potent caliber. This elk was taken by Francis B. Sell with his Winchester M71 in .348 caliber.



Col. Townsend Whelen, shown at left shouldering his Fred Adolph-made '03 Springfield sporter in .30-06, provided the inspiration for the tremendously popular .35 Whelen cartridge. The round is built on a .30-06 case necked up to accept a .358 bullet. It filled a definite power gap and required only reboring and rechambering of the old '03.

no's horn driven through the old man's thigh! The rhino had charged Cottar, who failed to stop it but wounded it; then while spitted by the front horn, he had finished the brute with his .405! He had been warned not to use his .405 on thick-skinned game, but Cottar was fearless and overconfident. He was carefully removed from under the rhino and his leg withdrawn from the horn, then he was administered first aid under a canvas canopy. They were too late—Cottar's femoral artery had been punctured and he knew the end was near. He asked that his last view be that of the African sky. The sons removed the canvas, and thus died "Bwana" Cottar, the great hunter, who should have been using his .470 Rigby double that day!

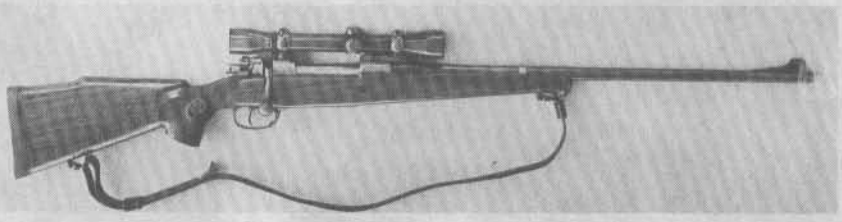
The main trouble with the Model 95 in .405 was its crescent-shaped steel buttplate which transmitted the .405's sharp recoil with a vengeance. Until 1937, when Winchester introduced the Model 70 in .375 H&H Magnum, it was (excepting the brief career of the .35 Newton) the ultimate U.S. factory rifle for grizzly, elk, moose and brown bear. The Model 95 was discontinued in 1936, but long afterwards, the British firm Kynoch continued loading the ammo. Owners of .405s can make cases by reforming and trimming RWS (Dynamit Nobel) Boxer cases for the 9.3x74R.

Around 1914, Charles Newton, an American lawyer with a rifleman's bent, introduced his Mauser-type Newton bolt action rifle with multiple locking lugs reminiscent of the Ross. Newton was already famous for having designed the Savage .22 Hi-Power and the .250-3000 Savage, as well as the .30 Newton. Newton necked up his .30 Newton case to take a .358-inch bullet, creating the famous .35 Newton. Newton's catalog claimed a 2,975 fps velocity for the 250-grain bullet and energy of 4,925 ft. lbs. Newton was anything but modest in his claims for the rifle and its ammunition, stating: "The .35 Newton, when used in a 7½-pound rifle, shoots fairly pleasantly, the recoil not being noticeably above that of a 12 gauge shotgun with a trap load, fired at a stationary target, and good target work can be done at 200 yards, offhand, with it. Here we have a rifle equal to the elephant gun in energy, far superior in killing power, due to its higher velocity, light enough to be carried by the sportsman himself, and free from disagreeable recoil. Its accuracy is of the best and for those who wish the most powerful rifle they can get, it is just what they want."

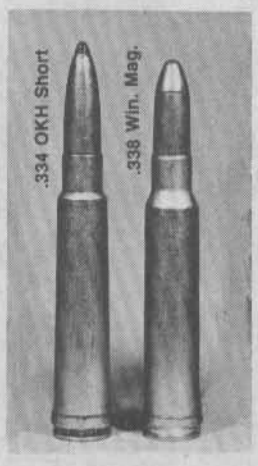
An amusing sidelight to Newton's promotional literature was his catalog's front page, published for the "Buffalo Newton Rifle" made in Buffalo, New York. At the top of the cover was: "A New Era In Rifles," but below that was this remarkable claim: "More velocity, more power, less recoil than any other rifle in the world!" I am tempted to comment that Newton—Charles, not Isaac—used another set of Newtonian physics laws for that remarkable claim! Despite such fatuous advertising, Newton was no imposter. To the contrary, he was decades ahead of everybody else in cartridge design. Though a poor businessman, he failed more from being ahead of his time than anything else. Who can say what might have happened if Winchester or Remington had chambered his .35 Newton?

The rifle and cartridge had a small but loyal following, including Charles Cottar, who liked the caliber, but complained that on some occasions while facing a charging animal the floorplate would open, and according to his friend Elmer Keith, Cottar simply reached down and picked up the spilled cartridges, slipping a single round "up the spout," just in time!

Newton introduced the .33 Newton with a 200-grain bullet at 3,000 fps and 4,000 ft. lbs. energy, and a .400 Newton with a 350-grain bullet at a claimed 3,042 fps and 6,180 ft. lbs. energy! His rifles were light for caliber and had various design shortcomings, making a double problem—to sell revolutionary cartridge *and* rifle design in the same gun. The .400 Newton was mostly a paper project, and according to Newton: "The .33 Newton we have decided to abandon, as there was very little demand for it; most sportsmen who wanted anything more powerful than our .30 caliber taking the .35 caliber." Loaded commercially today, Newton's advanced cartridges



The .334 OKH was one of Keith's best performers. Coupled with his custom Mauser action rifle, it proved to be adequate for most large game.



Elmer Keith collaborated on the development of the OKH series of wildcats. The .334 OKH Short is on a par with the .338 Win. Mag. A full-length version, the .334 OKH, helped Keith to bag his first polar bear.

BIG BORE REPEATER

would be competitive with any similar belted magnums, and indeed, one of the greatest tributes to Newton's genius is the fact that both .30 caliber and .35 caliber wildcats were created solely to provide Newtonian ballistic equivalents in available brass. I own one of these wildcats, a ".35 Belted Newton," using modern belted brass, but aside from better powder and bullets, not one whit better than Charlie's original .35 circa 1914! Those with .30 or .35 Newton rifles can make cases from 8x68S Boxer brass by RWS (Dynamit Nobel).

With the advent of Newton's beltless magnums, the American trend towards ultra-high velocity was underway, but with the collapse of Newton's business, the commercial viability of the ammunition was short lived. In the Twenties and Thirties the demand for big bore magnums was met by imported British and German sporters or domestic custom Mausers and Springfields by such as Griffin & Howe and the now defunct Hoffman Arms Co. The New York custom rifle firm of Griffin & Howe began as a partnership between Seymour Griffin and James V. Howe, who had been

With its introduction of the Model 70 in .375 H&H Magnum (above), Winchester built real stopping power into a factory rifle. Robert E. Petersen put it to the ultimate test in Tanzania on this fine Cape buffalo (left).

the toolroom foreman at Springfield Armory under Col. Townsend Whelen. Having designed the .35 Whelen and named it in honor of the colonel, Howe introduced the cartridge as Griffin & Howe's special big bore in fine custom Springfield sporters. The Western Cartridge Co. made ammo for G&H with their headstamp, and rifles for the cartridge became a popular item. The .35 Whelen is simply the .30-06 necked up to take a .358-inch bullet, and its ballistics can be stated as a 220-grain bullet at 2,700 fps, a 250-grain at 2,500 fps, a 275-grain at 2,400 fps and a 300-grain at 2,300. These are approximate but close, depending on load. Elmer Keith became the leading publicist of the .35 Whelen and deserves much credit for making it popular. It owes part of its popularity to the happy fact that all that is required to convert a 1903 Springfield to .35 Whelen is to rebore and rechamber the original barrel. Mauser 98s are about as easy, but sometimes the magazine must be lengthened a bit.

After the famous American professional African hunter Leslie Simson wrote Col. Townsend Whelen in the Twenties that his idea of the perfect "all around" rifle was a .35 caliber firing a 275-grain bullet at 2,500 fps, the .350 Griffin & Howe became a reality. It was introduced around 1927 in magnum Mauser action Griffin & Howe sporters with Western Cartridge Co. ammunition and the "G&H" headstamp. Around the same time Western began producing .375 H&H Magnum ammo in 235-grain, 270-grain and 300-grain weights. The appeal of the British-born .375 had caused, first, an invasion of the rifles and ammo from London, and finally Griffin & Howe and Hoffman were swamped with orders for domestic custom jobs on the big magnum Mauser actions. The .350 G&H Magnum suddenly had no exclusive reason for existence, and it fell by the wayside—a fine cartridge, but with the .375's availability in domestic ammo, a redundancy.

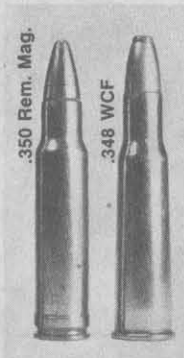
Hoffman had been founded by Col. Snyder, an American oil magnate, and due to personal disagreements with Seymour Griffin, James V. Howe became Hoffman's prize talent. Hoffman rifles strikingly resemble Griffin & Howe rifles, always rust blued and stocked with the finest European or Turkish walnut. By 1927 the American custom bolt action rifle had come of age. Both Griffin & Howe and Hoffman produced rifles for the .375, .404 and .505 Gibbs for the new class of American hunters who were emerging from a purely North American habitat to become globetrotters. Teddy Roosevelt, Stewart Edward White, James L. Clark, Edgar B. Bronson, William Rainsford and others began the overseas treks before World War I. By the 1920s, Safariland and other safari outfitters had sprung up in Nairobi and were booming with bookings from the newly affluent Yanks. Dr. Richard L. Sutton was one of the best and used a .375 Magnum Hoffman magnum Mauser, as did Theodore Roosevelt, Jr. in India and Indochina. John W. Eddy used his .35 Whelen Griffin & Howe and a .405 Winchester on his 1927-1928 Alaska hunt.

Around that time an obscure, self-educated Montana cowpuncher and "gun nut" began writing articles on rifles, loads and hunting for outdoor magazines. It was obvious that he knew something about rifles, sixguns and shotguns and could make deadly use of them all. His reputation as a hunting guide also grew, and he did not remain obscure for long. You may be ahead of me and have already guessed that his

initials are "E.K," and that "E.K." stands for Elmer Keith, the Executive Editor of *Guns & Ammo.* In my view and that of many informed shooters and hunters, Elmer Keith, more than any other individual, deserves the credit for the informed promotion of the use of the best in large caliber rifles for more efficient and humane hunting of the larger species. Keith is also owed major credit for the development of our pioneer large bore wildcats, some of which have been the model for certain factory calibers. As for Keith's work with handguns in developing bullets, loads and new cartridges, that's another story, as fascinating and successful as his rifle work. In his 1936 *Big Game Rifles and Cartridges,* Keith said this about the .35 Whelen: "I consider the .35 Whelen the best of all our larger caliber rifles for all species (American species). While the bolt action is not as fast as the lever, pump, automatic or double-barreled rifles, it is nevertheless a very fine rifle and cartridge for timber hunting by the man who does his best to plant that first shot where it belongs. Recent group shooting at 200 yards produced five-shot groups averaging 2¾ inches. Such accuracy is good enough for me for big game hunting, and if I were forced to use just one rifle for all species of big game, I would certainly choose this .35 Whelen rifle. It is not only a beautiful example of gun making but a very effective rifle on anything found on this continent."

Keith's .35 Whelen Springfield was one of the first built by James V. Howe at Griffin & Howe. James V. Howe liked Keith and presented him with the first .400 Whelen. It was on a Springfield action and used the .30-06 case necked up to take a .412-inch bullet. It fired a 350-grain Western Tool & Copper Works semi-spitzer at 2,300 fps. In *Big Game Rifles and Cartridges,* Keith said: "The .400 Whelen rifle and cartridge I consider the most powerful of all our American-loaded big game cartridges, when used with the Western Tool and Copper Works 350-grain semi-pointed bullet at 2,300 fps. I have used this rifle over a period of 11 years and have a lot of respect for it. It has accounted for 10 elk and eight mule deer in my hands as well as another elk for my father."

In the Twenties and early Thirties, if an American wanted more power than available in factory rifles (excepting the Model 95 in .405), he could buy a costly British or German import or have a .35 Whelen or other big bore built on a Springfield '03 or Mauser 98 action. Thus in those days the wildcat wasn't just a non-factory cartridge, but in most cases a cartridge the likes of which were unavailable in factory ammunition. The 1927 beginning of U.S. production of .375 H&H Magnum ammo helped only those who could afford expensive magnum Mauser-action custom rifles by Griffin & Howe, Hoffman or an import at higher cost. In those days, the most powerful factory caliber, aside from the .405, was the .30-06 in the Winchester Model 54 and



In a vain attempt to stir up interest in a .35 cal. round, Remington produced its Model 600 in .350 Rem. Mag. (above). Although it was a good brush gun and outperformed the .348 WCF (left), it never caught on and was subsequently discontinued in 1974.

MODERN AMERICAN BIG BORE BALLISTICS

Cartridge	Wt (gr)	Bullet Type	B.C.	Velocity—fps (Energy—ft.-lb.) Muzzle	100 yd	200 yd	300 yd	400 yd	500 yd	Trajectory (+) inches above, (-) below line of sight 0 indicates sight-in (zeroed) range 50 yd	100 yd	150 yd	200 yd	250 yd	300 yd	400 yd	500 yd
8 mm Rem. Mag.	185	P	.300	3080 (3896)	2761 (3132)	2464 (2494)	2186 (1963)	1926 (1524)	1687 (1170)	+0.6	+1.5	+1.4	0	-2.8	-7.3	-22	
	220	P	.377	2830 (3912)	2581 (3255)	2346 (2688)	2123 (2201)	1913 (1787)	1716 (1439)	+0.8	+1.9	+1.6	0	-3.2	-8.2	-24	
.338 Win. Mag.	200	S	.307	2960 (3890)	2658 (3137)	2375 (2505)	2110 (1977)	1862 (1539)	1635 (1187)	+0.6	+1.7	+1.5	0	-3.0	-7.9	-24	
	225	P	.436	2780 (3860)	2572 (3304)	2374 (2815)	2184 (2383)	2003 (2004)	1832 (1676)	+0.9	+2.1	+1.8	0	-3.3	-8.5	-24	
	250	S	.330	2660 (3927)	2395 (3184)	2145 (2554)	1910 (2025)	1693 (1591)	1497 (1244)	+1.0	+2.3	+1.9	0	-3.8	-10	-29	
	300	R	.299	2430 (3933)	2152 (3084)	1893 (2387)	1655 (1824)	1443 (1387)	1265 (1066)	+1.6	+3.0	+2.5	0	-5.1	-13	-38	
.340 Weatherby Magnum	200	P	.321	3210 (4575)	2905 (3747)	2615 (3036)	2345 (2442)	2094 (1947)	1862 (1539)	+1.0	+2.3	+2.9	+2.1	0	-3.5	-15	-35
(26" barrel)	250	S	.339	2850 (4508)	2580 (3694)	2325 (3000)	2090 (2424)	1865 (1930)	1655 (1520)	+0.8	+1.9	+1.6	0	-3.4	-8.6	-25	
.375 H&H Mag.	270	S	.326	2690 (4337)	2420 (3510)	2166 (2812)	1928 (2228)	1707 (1747)	1507 (1361)	+1.0	+2.2	+1.9	0	-3.7	-9.7	-29	
	300	M	.236	2530 (4263)	2171 (3139)	1843 (2262)	1552 (1604)	1307 (1138)	1126 (844)	+0.6	+1.3	0	-3.4	-9.4	-19		
	300	S	.325	2530 (4263)	2268 (3426)	2022 (2723)	1793 (2141)	1584 (1671)	1397 (1300)	+1.3	+2.6	+2.2	0	-4.3	-11	-33	
.378 Weatherby Magnum	270	S	.323	3180 (6061)	2872 (4944)	2592 (4027)	2327 (3246)	2076 (2583)	1843 (2036)	0	+0.4 +2.5	0 +2.9	-1.8 +2.1	-4.9 0	-10 -3.6	-16	-36
(26" Barrel)	300	S	.328	2925 (5698)	2640 (4642)	2380 (3772)	2125 (3007)	1896 (2394)	1680 (1880)	+0.7	+1.8	+1.6	0	-3.2	-8.0	-24	
.458 Win. Mag.	500	M	.346	2040 (4619)	1823 (3689)	1623 (2924)	1442 (2308)	1284 (1839)	1161 (1496)	+1.4	+2.0	0	-5.0	-13	-25		
	510	R	.278	2040 (4712)	1770 (3547)	1527 (2640)	1319 (1970)	1157 (1516)	1046 (1239)	+1.6	+2.2	0	-5.4	-14	-28		
.460 Weatherby Mag. (26" Barrel)	500	R	.250	2700 (8092)	2350 (6030)	2030 (4574)	1730 (3322)	1478 (2425)	1267 (1782)	-0.1	0 +2.4	-1.5 +2.1	-4.6 0	-10 -4.2	-18 -11	-34	

P=pointed, S=semi-pointed, R=round nose, M=metal case

BIG BORE REPEATER

the Remington Model 30. The most direct and economical route to bores and power best suited for elk, moose and grizzly was a 1903 Springfield, 1917 Enfield or a 98 Mauser with a .35 Whelen rebore and rechamber, so one could use the cheap and available military actions and government .30-06 brass available from the D.C.M.

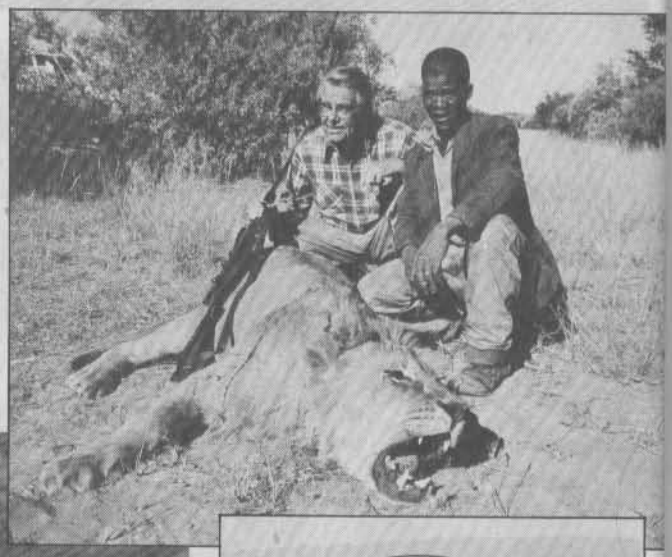
Elmer Keith, Washington sportsman Donald Hopkins and gunsmith Charles O'Neil combined forces to develop the OKH series of wildcats for available actions and to fill wide gaps in calibers suited to North America's largest and sometimes dangerous game. The .333 OKH used .333 Jeffery bullets by Kynoch and a .30-06 case with only a simple necking up. With 275-grain bullets at 2,500 fps and 300-grain Kynoch bullets at 2,300 fps, it had a deserved reputation for deep penetration. The .334 OKH came later and was on a necked down .375 H&H Magnum case or a necked up .300 H&H Magnum case. It used the same bullets as the .333 OKH, but at higher velocity and on magnum length actions such as a converted Model 1917 Enfield or a magnum Mauser. Except for the case shoulder contour, it is nearly identical to today's .340 Weatherby Magnum. The later .334 OKH Short Magnum is virtually the same as the .338 Winchester Magnum except for the increased bullet diameter of the latter, and Elmer's wildcats are the direct ancestors of these potent, versatile .33 caliber rounds.

Winchester's 1937 introduction of the Model 70, including .375 H&H Magnum among its chamberings, was a "quantum" jump into factory rifles with real "stopping power"—in fact, a world-beating first! It marked the end of those exclusive days when such power was restricted to the wealthy few who could afford the posh creations of Holland & Holland, Griffin & Howe, Hoffman, etc. It certainly helped elk, moose and bear hunters to reduce wounded and lost game and saved lives by quick stopping. In Africa, the new Model 70 placed an adequate rifle in the hands of the many farmer-hunters, helping to discourage the popular use by these of inadequate surplus army rifles on large and dangerous game.

Meanwhile, Winchester had introduced the last of the smokeless versions of the much-loved Model 1886 lever action, the Model 71 in a new large caliber to replace the .405. It was the .348 Winchester, a potent round for a lever action, but no .405, despite the intent. With a 250-grain flat-nosed bullet at 2,350 fps and 3,060 ft. lbs. energy, a 200-grain bullet at 2,530 fps and 2,840 ft. lbs. energy, and a 150-grain bullet at 2,890 fps and 2,780 ft. lbs. energy, it achieved a good reputation for elk, deer and black bear. It wasn't the "stopper" the .405 was, so Alaskan guides who preferred a lever action continued with their elderly .405s until Harold Johnson, a gunsmith in Cooper's Landing, Alaska, created his .450 "Alaskan" for the rebarreled Model 71, a .458-inch caliber based on the .348 case and giving flat-nosed 400-grain .458-inch bullets over 2,100 fps velocity. It achieved a small but fairly intense following due to its filling of a genuine gap left among lever actions by the .405's demise.

After World War II, a newly affluent

Winchester Model 70 African



Winchester was the first to offer an African class factory rifle with its Model 70 in .458 Win. Mag. It was soon followed by the .338 Mag., built on a necked down .458 case. The .338 is truly a potent cartridge with plenty of recoil (below) and a lion-stopping wallop (r)!

Aside from its impressive power, the Model 70 African is also an extremely accurate gun. At 50 yards the mighty .458 printed this cloverleaf group.

crop of merchants and manufacturers "arrived" to create the largest group of worldwide big game hunters ever seen. They wanted more powerful rifles, but with a difference—they were less inclined to plump down large sums for imported big bores since they had witnessed or participated in America's incredible arming of the Allies in World War II, and they knew there was nothing about the construction of such big bores that was beyond the considerable talents of domestic smiths.

The new breed of American rifleman-hunter was usually an NRA member, a handloader and a reader of articles by Keith, Whelen, O'Connor and the like, but he was not dependent on the big factories or Europe for rifles or ammo for rifles of bigger bore and clout than available "over the counter." The postwar era was the "age of the wildcats" with Elmer Keith and John R. Buhmiller the leading "Pied Pipers" of the big bores. Fred Barnes, the Colorado gunsmith, developed quite a business making copper tubing-jacketed bullets for the wildcats and anything else, including the British calibers. There was a need for an elephant-size caliber on available brass and before long it arrived when Yakima, Washington gunsmith H.B. Anderson introduced the .450 "Watts" which Elmer Keith insists is the .450 Ashurst, for Jack Ashurst, who Keith says was the actual designer. Knowing Keith's reliability in such matters, I defer to him. The cartridge used the .375 H&H full-length case, but preferably the Norma basic belted cylindrical brass which was three inches long. It exceeded the power of the British .450 and .470 nitro-expresses when its Barnes or Kynoch 480 or 500-grain bullets were loaded ahead of full loads of IMR powders. Working loads, however, with 480 or 500-grain bullets were usually from 2,150 fps to 2,250 fps.

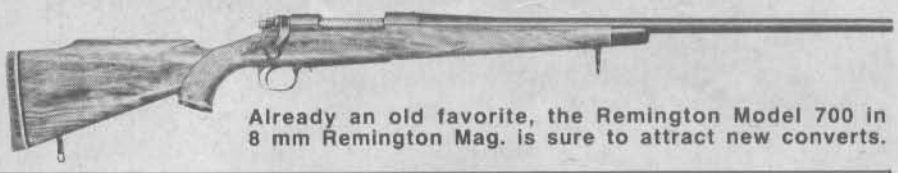
The spread of jet-propelled air travel brought Africa within the reach of the middle class, and the clients stateside were ready and could obtain the rifles and ammunition at home. Meanwhile, around 1948, a South Gate, California wildcatter named Roy Weatherby jumped into the expanding big bore magnum market with his "improved" magnums, including his now obsolete .375 Weatherby Magnum, a blown-out standard .375 H&H case giving more powder capacity and hence somewhat higher velocity.

With the competition among safari outfitters reducing safari costs and new hunting areas opening up all over tropical Africa, and with Alaskan and Canadian outfitters booked up two years ahead, somebody was bound to introduce an African class factory big bore. "Somebody" was Winchester. They took the basic concept of the .450 "Watts/Ashurst," and using a 2½-inch shortened .375 H&H belted case and a 500-grain .458-inch steel-jacketed solid and a 510-grain soft nose, introduced the .458 Winchester Magnum round and its matching Model 70 "African" model in 1956. According to factory ballistics the 500-grain solid reached 2,130 fps in the 25-inch barrel for 5,040 ft. lbs. energy—almost exactly that of the .470. It was a great success and the .458 story is one meriting a separate chapter.

By the mid-Fifties the .375 H&H Magnum was the world's favorite "all around" big game magnum—the standard by which all such calibers were judged. But it requires a "magnum" length action for its 2.850-inch case as compared to the .30-06's or the .458's 2½-inch case for standard length actions. Winchester decided that Keith's .334 OKH had shown the way and introduced in 1958 the .338 Winchester Magnum for the Model 70, using the .458 case necked down and instead of .333 caliber used the .338-inch diameter of the old .33 Winchester round. Suddenly there was no need for those .33 caliber wildcats, and another factory option was available for the elk, moose or Alaskan bear hunter who found .30 caliber too light.

The .338 seems an unlikely bore size for an under-.375 caliber magnum, especially with the examples of the .35 Whelen and the .350 Griffin & Howe, but Keith had a

Remington's "Big Eight" cartridge is based on the .375 H&H case calling for a full-length magnum action, and the Model 700 is the only one chambered for it.



Already an old favorite, the Remington Model 700 in 8 mm Remington Mag. is sure to attract new converts.

In a frozen netherworld, a hunter prepares to take a muskox. The long range power and flat trajectory of the 8 mm Magnum suit it for much North American hunting.

point. With a .33 caliber magnum and bullets from 200 to 300 grains at .375 H&H velocities, one has generally better sectional density and retained velocity for long range shooting. The fairly big bore and heavy-for-caliber bullets also have the smashing power for close range hunting of the largest North American game. For Africa, it was and is an ideally powered round for everything but pachyderms and wounded lions.

The .338 suffers perhaps from its being a bit more gun than needed for the lower 48 and a bit less than needed as an "all around" African caliber. African caliber restrictions generally limit the rifle for the "big five," and sometimes eland, to .375 Magnum or over. Nonetheless, the .338 is an outstanding world-class cartridge of compact proportions with the bullets to match. With adequate placement, it is capable of cleanly taking any game anywhere with suitable bullets. Field experience consensus places its performance about 20 percent under that of the the .375 H&H Magnum, which is a compliment to the .338, not a criticism.

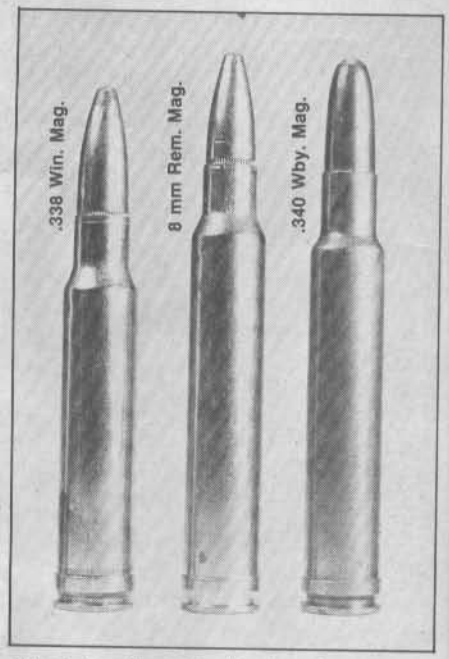
The curious omission of .35 caliber among the modern American large bores was remedied when, in 1965, Remington introduced their Model 600 in .350 Remington Magnum. It is a short, fat, belted magnum with a 200-grain spitzer at 2,710 fps and a 250-grain at 2,410 fps. With energy of 3,220 ft. lbs. (for the 250-grain load), the .350 Remington Magnum's power falls just under that of the .35 Whelen, but it is the closest thing to the .35 Whelen in a factory round. The cartridge, although excellent in brush and for game up to elk, moose and bear at moderate ranges, was never popular. Remington ceased chambering it in 1974. Ruger ran off a special chambering for it in their Model 77, but that intermittent jinx which periodically afflicts .35 caliber U.S. chamberings once more creates a gap.

The filling out of the Weatherby line of magnums and the introduction of the Mark V action rounded out the limits of the modern American factory big bores. To replace the .375 Weatherby Magnum, the .378 was introduced in the mid-Fifties and was field tested in Africa by Elgin Gates. It is a .375 caliber magnum on a belted case with similar dimensions to those of the .416 Rigby. It fires a 300-grain bullet at 2,925 fps (26-inch barrel) and 5,700 ft. lbs. energy and a 270-grain bullet at 3,180 fps and 6,051 ft. lbs. energy. It is for the man who wants the most velocity available from a .375 caliber factory cartridge and who wants that amount of energy in something under .450 caliber.

The .340 Weatherby Magnum is one of the most useful cartridges in the Weatherby stable, using 200, 210 and 250-grain .338 caliber bullets—the 200-gr. at 3,210

The .340 Wby. Mag. is a slugger that has the range and punch to make it adequate for medium to thick-skinned game like this Alaskan brown bear.

Robert E. Petersen (left) displays a fine New Mexico elk cleanly taken by his 8 mm Remington M700, an appropriate caliber for all large game in the U.S.



When hunting big N. American game like elk, moose or bear, a potent load is required to limit the possibility of wounded game as well as to ensure the safety of the hunter. The "big bruisers" above are sure to put meat in the pot!

fps and 4,566 ft. lbs., 210 grains at 3,165 fps and 4,560 ft. lbs., and 250 grains at 2,850 fps and 4,510 ft. lbs., all for 26-inch barrels. Speaking personally, the .340 is my favorite Weatherby magnum as the most powerful long range factory caliber for plains and mountain game.

In 1955 John R. Buhmiller went to Tanganyika on an extended hunting trip where, at the age of 65, he became an elephant and buffalo control hunter, using his self-designed wildcats. Among them was the .450 Buhmiller using a .378 Weatherby case necked up to take 500-grain and 600-grain Barnes bullets. Buhmiller built the rifle on a 1917 Enfield action, and it worked—so well, in fact, that it caught the eye of Roy Weatherby. This wildcat cartridge is now the great .460 Weatherby, the most powerful factory cartridge ever introduced for over-the-counter rifles. Weatherby had always believed that with enough velocity, one needed no more than .30 caliber, but as mentioned, the African caliber regulations required calibers of .375 Magnum or more for the Big Five and in some places, over .40 caliber. For those wanting the ultimate in shoulder-fired power, the .460 Weatherby is reason enough to look no further! With its 500-grain bullets from a 26-inch barrel moving at 2,575 fps (based on our chronographed tests at 15 feet instrumental velocity), it is well over the power needed for heavy, dangerous game. But despite its heavy recoil, the cartridge is not a shoulder breaker in Weatherby or other suitably weighted and designed rifles as we have confirmed. Experienced African hands who have used the .460 believe in it, and it is said to be the only modern rifle that will literally flatten a Cape buffalo.

The variety of domestic rifles and actions available for modern big bore calibers continues to grow in much greater proportion to the number of hunters actually seeking dangerous big game. Much of this is attributable to the singular appeal of raw power *per se,* as with the buyer of high-powered cars or the builder of a "hot rod" who doesn't need one simply for transportation. There are also plenty of riflemen who aren't big game hunters but who enjoy shooting at targets, and "plinking"—yes, that's what I said—with .460s, etc., at tin cans, rocks or stumps! Others let their heavies stand impressively in gun cabinets to be seen by visitors, or perhaps they are owned by collectors who want one each of all the variations of a certain model such as Model 70s or Weatherby Mark Vs. Whatever the reason, big bore rifles are incredibly popular in American today!

The "big three" rifle makers—Remington, Ruger and Winchester—all make bolt action .458s, but Ruger makes no turnbolt .375 as do the other two, instead offering the .338 in their Model 77, but Ruger does make their No. One single shot in .375 H&H Magnum.

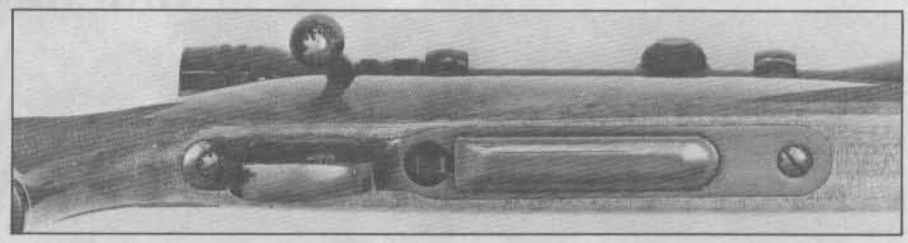
Remington's recent introduction of their potent 8 mm Remington Magnum was a bold innovation—Remington's second in metric magnums. The 8 mm Remington Magnum is a .323-inch caliber powerhouse with a 185-grain spitzer at 3,080 fps and 3,896 ft. lbs. energy, and a 220-grain spitzer at 2,830 fps and 3,912 ft. lbs. energy. It is right there among the .338 class cartridges—the .338 Winchester Magnum and the .340 Weatherby Magnum—in its long range, heavy punch persuasion.

It should be mentioned that the 8 mm Remington is a full-length magnum, using the .375 H&H case necked down to .323 with straight walls and a fairly sharp shoulder. Incidentally, Remington's Model 700 is a full-length "magnum" action thus accommodating the long 3½-inch-plus

Ruger has made definite inroads into the magnum market with their tremendously popular Model 77 series. Offered in a wide range of calibers, they are functional as well as affordable.

This Colt-Sauer .458 is made in West Germany by J.P. Sauer for Colt and is marketed by that firm in the U.S. Dubbed the "Grand African," in .375 it becomes the "Grand Alaskan."

The Colt-Sauer features a tang safety that locks the sear and the trigger mechanism (left). The attractive finish and wood to metal fit are evidence of the fine craftsmanship that goes into this piece. Functional attributes include the detachable box magazine with flush-mounted release (below).



BIG BORE REPEATER

Remington 8mm Magnum cartridges.

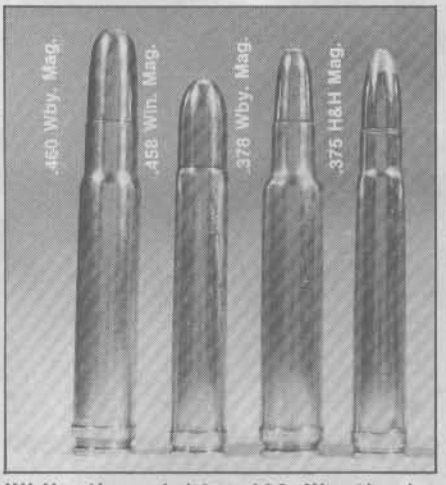
The Interarms Mark X Mauser with a Yugoslavian (Zastava) action is becoming very big in this big bore market with both a .375 and a .458. The action is almost identical to the former F.N. (Belgian) Series 400 "Supreme" Mauser action with its side safety, adjustable trigger and similarly shaped bolt sleeve. A strong point about these Mark X rifles, especially in .375 and .458, is that there is a barrel recoil lug in addition to that of the receiver, and both are strongly epoxy-bedded. On the negative side—and this applies to most factory big bores—is the excessive clearance machined from the wood around the magazine and in the trigger area. This weakness is easily eliminated, however, and is just the thing for the owner to remedy on cold winter nights when there is nothing interesting on TV. All that's needed is a box of Micro-Bed stock bedding compound and a heavy paste wax release agent or Bob Brownell's Accra-Glass and some modeling clay sold in children's toy or art supply shops. Pack any gaps with clay where the epoxy is apt to flow out of the area to be filled, and to restore the machined-out strength in the trigger area, cover the trigger with an adequate amount of modeling clay to correspond to the working clearance needed, then fill the rest with bedding compound. Remove the barreled action and the clay, but be careful to also cover any interior side safety parts with clay so it too can function after filling with epoxy. If done

Producing around 8,000 ft. lbs. of energy with a 500 gr. bullet, the .460 Weatherby is tops in shoulder-fired stopping power!

carefully, this will restore and increase stock strength at the weakest point, an important consideration for all big bores with their heavier recoil. Any remaining interference preventing normal functioning of the trigger or safety can be removed with a small pocket knife or hand grinder.

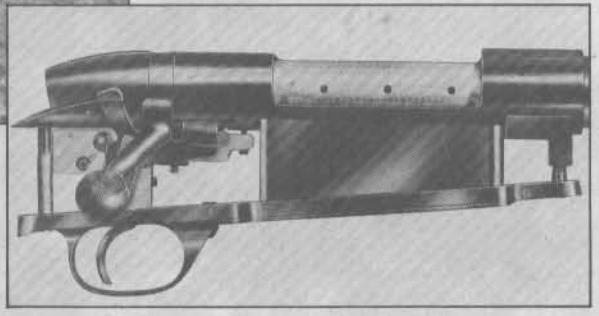
Interarms also makes the Whitworth Express rifle, a traditional English-type classic with selected European walnut, express sights and a barrel band sling stud, available in .375 and .458. Otherwise the Whitworth is similar to the Mark X since it uses the same action. One criticism is that the butt area is unduly slim for such heavy recoil. Originally the Whitworth was made in Manchester, England, but now it is made in the United States. Most of the other big bores produced in the United States fall into the custom and semi-custom categories and are dealt with in a separate chapter.

It is remarkable that Alaskan and African big bores are routinely produced by our factories, whereas not so long ago one had to be wealthy to be able to buy a custom American, British or European custom rifle in big bore—the only options. By the same token, the production big bore cannot have the same close inletting and hand-polished action of the custom article because handwork is expensive. This is not much of a problem, however, given the basic rifle and ready-made home gunsmithing products like epoxy bedding compounds and abrasive paper and cloth from the corner hardware store. Feeding problems with production rifles are more common, naturally, than with custom rifles, but even these can be corrected by the amateur at home. I remove the striker (firing pin) assembly from the bolt and load the magazine with real or dummy rounds and try to create jams. I coat the feed ramp with Dykem layout blue or coat with a black or dark blue felt marking pen so I can see where the bullet noses jam. I then remove any excess metal by using a hand grinder such as the Dremel, by working the contact spots down carefully until the jams no longer occur. I then polish with emery cloth wrapped to a suitable diameter, just under the radius of the feed ramp after slotting a ¼-inch length of drill rod or mild steel to hold the end of the emery cloth. I begin polishing when I have the contour right, beginning with 400 grit and finishing with 600. If crocus cloth is used, do so after first polishing with 600 grit. If such home measures are properly done so that the stock is strengthened to resist the splitting effects of recoil and the action polished to create smoothness of operation and jamming tendencies eliminated, the production big bore will usually keep up with the best custom article in the essentials. Do plenty of range practice after sighting in, and be sure to keep guard screws tight with a properly fitting screwdriver and to use *semi-hard, not* hard-setting Loc-Tite to keep scope mount screws from coming loose. Ensure that hinged floorplates don't open with recoil, and if they do, try a much stiffer coil spring for the catch/plunger. If this fails, take the rifle to a good gunsmith and have him secure it. Generally speaking, your production big bore should now be fit for any challenge within the capabilities of yourself and the caliber.



While the mighty .460 Weatherby Magnum leads the pack in terms of power, all of these cartridges are popular in North America as well as Africa.

This Weatherby Mk V in .378 is a fine example of a powerful proprietary caliber in a beautiful package. The rifle is ornately engraved throughout and features California mesquite.



Weatherby's monster cartridge, the .460 Wby. Mag. (above), was designed to meet the most stringent African game requirements. It utilizes the Mk. V action (right).

If I seem to sound unduly critical of U.S.-made big bores, it's not meant that way. American rifles are the best in the world for the money, and most compare favorably with custom guns costing much more. However, the basic premise of a big bore rifle is that you may have to stake your life on its performance. Even if that doesn't happen, you are gambling its performance on an expensive Alaskan or foreign hunt, or even on your elk tag! (Have you priced them lately?) With that in mind, it becomes common sense to check the bedding and feeding of *any* rifle, but especially the big bore!

CHAPTER 6

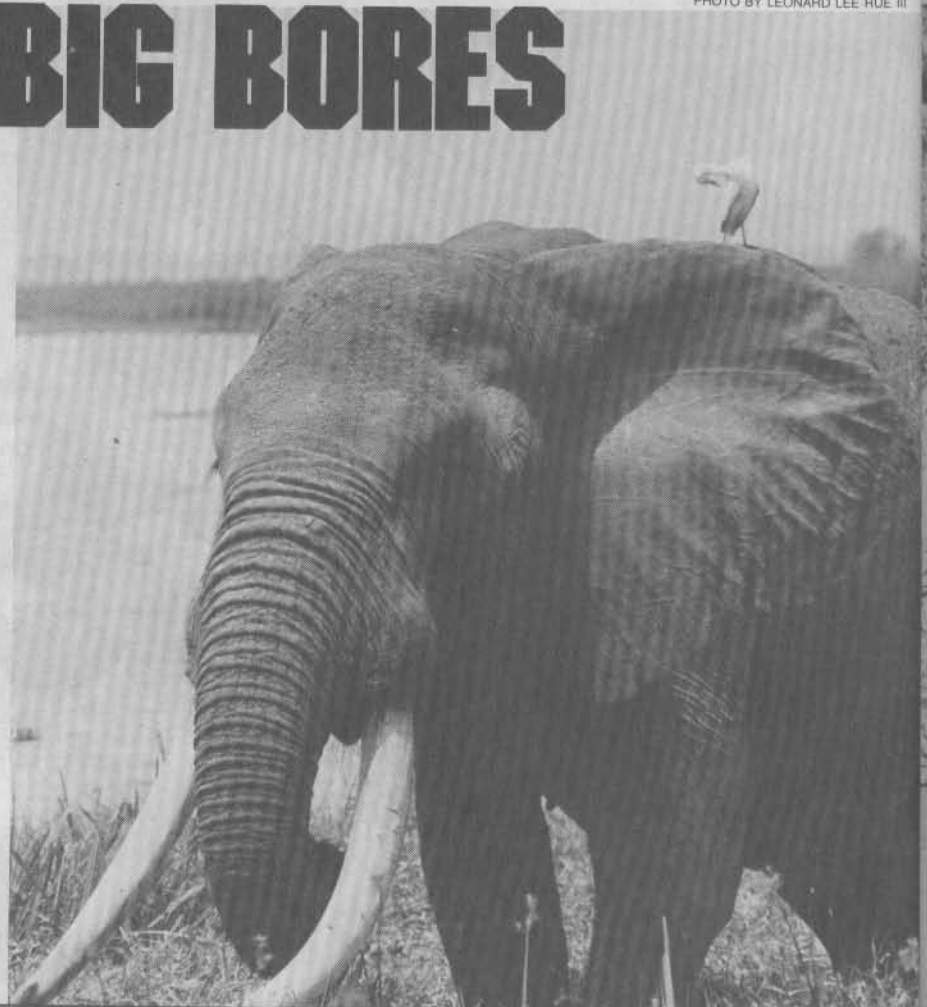
IMPORTED BOLT ACTION BIG BORES

With game-rich overseas colonies and plenty of globe-trotting hunters, Germany and Great Britain answered the demand for inexpensive repeating "stopping" rifles!

To understand the thinking behind the big bore bolt action rifle and its cartridges, we must examine its roots. The hub of the international big game hunting world in 1890 was Great Britain, then at the height of its trajectory in ruling the greatest and richest empire of all time. With a long tradition of hunting and vast colonies and dominions, their market for big game rifles was inexhaustible. British custom makers were unable to keep up with the burgeoning demand from military officers, civil servants, planters, professional hunters and the native potentates of India. The Germans too, had a long hunting tradition and a sprawling domestic custom gun industry as well as the largest mass production small arms factories in the world. Germany, like Britain, was also a great African colonial power, with German East Africa (Tanganyika), South West Africa and the Kameruns (Cameroons).

The introduction in 1890 of the 6.5x53R Mannlicher-Steyr charger clip rifle with its 162-grain cupro-nickel jacketed "pencil" bullet at 2,400 fps jolted the British and Continental sporting arms makers. Since the failure of the black powder light-bullet expresses on dangerous game through premature bullet breakup, the trend was to bigger and bigger caliber, heavier gun weight, more recoil and smoke. The .577 three-inch black powder express of Sir Samuel Baker was regarded as the best "small bore" substitute for such heavies, but this still meant a 12-pound gun costing many pounds Sterling. When, around 1892, the Steyr Austrian Gun Works began

PHOTO BY LEONARD LEE RUE III

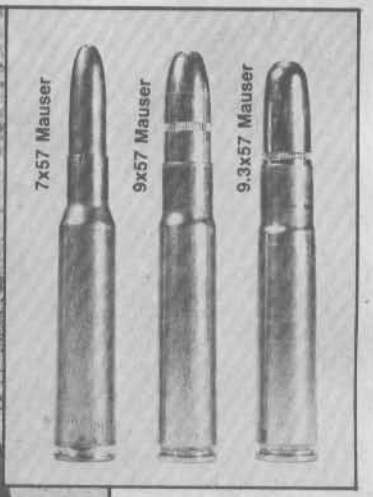


Among the last sporters with a true Mauser action is Interarms' Mark X like this .375 with a Yugoslav-made action.

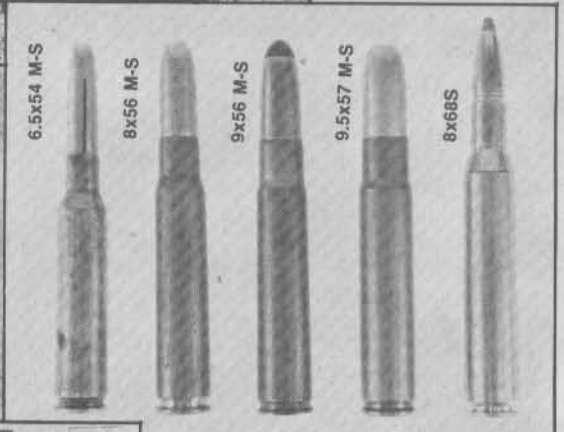
selling their new 6.5x53R Mannlicher military rifle for 80 shillings ($16), many leading British rifleman-hunters jumped at the chance to buy one. The public reaction to the new small bore bolt actions was anything but hidebound; instead, the popular view was that the big bore doubles and singles were on their way out.

In 1892 the 6.5 Mannlicher-Steyr was adopted by Romania and, in 1895, by Holland as a military rifle. Captain George Gibbs, rifleman, custom gunmaker of Bristol and superintendent at Enfield Arsenal, quickly saw the advantages of the new Mannlicher and the incredible penetration of its 162-grain bullet at 2,400 fps. Sir Edmund Loder, a prominent trophy hunter, was one of the first to jump on the accelerating ".256" bandwagon. The greatest wild sheep hunter of that or any day was St. George Littledale. In a 1926 letter, Littledale tells how he obtained his .256. "In 1895 Sir Edmund Loder gave me a Mannlicher rifle, bayonet and all, complete on the eve of starting for Tibet. Had only time to have sighting altered. On my protesting that I had a room full of rifles and did not want any more, all he said was, 'Try the Mannlicher,' and like Lily Langtry and the soap, I have used no other since."

From A. Blayney Percival, Kenya's Game Warden for many years, is this comment *(A Game Ranger's Notebook)*. "I shot most of my lions, say forty, with the .256, I do not remember exactly, but I feel that two-thirds of the lions did not need a sec-



The German 8x57J service round had a number of offspring, including those above. Although considered "mediums," the 9x57 and 9.3x57, for their calibers, are not too potent.



Above: The Mannlicher-Schoenauers were highly popular in their day. All of these cartridges except the 8x68S were created for Mannlicher-Schoenauer rifles and carbines. A special Mannlicher-Schoenauer action was developed for the 8x68S.

Left: Some of the most powerful for caliber of metric cartridges were developed by Brenneke and featured his TUG and TIG bullets. The 9.3x64 Brenneke is so powerful that its ballistics even surpass those of the .375 H&H Mag.

(Top and above) The great English gunmaking firm of Holland & Holland made some of the finest of all bolt action hunting rifles.

ond bullet; if one did, it usually meant several more. When hunting alone I seldom fired 'til I had a lion just how I wanted him, and I shot to put him out of business. Soft-nosed bullets I gave up long ago except for small stuff or in a heavy rifle."

British custom makers began offering sporter versions of the ".256" Mannlicher-Steyr with typical express sights (wide "V" with platinum centerlines and snap leaves for longer ranges). The demand for sporting rifles exceeded the capacity of their hand craftsmen to satisfy with custom double and single rifles. Instead of being undercut by this cheap foreign competition, they boomed with the extra business, buying the Mannlichers cheap and after a bit of sporterizing, selling them for a nice profit, meanwhile keeping the doubles and singles as well as shotguns coming.

Scotsman W.D. "Karamojo" Bell was perhaps the greatest exponent of small calibers on dangerous game. He made a large fortune as a successful ivory hunter.

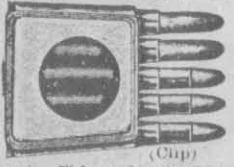
Affluent American rifleman-hunters in touch with their British counterparts took to the 6.5 Mannlicher. In a 1928 letter to noted hunter Denis D. Lyell, the air brake magnate Charles Sheldon wrote, "I have used this same (.256) rifle continuously and exclusively since 1899, and will continue to use it, I hope for many years more. The first bullets were the Jeffery 'splits.' Though occasionally one would shatter, yet they were satisfactory. But when your book *Central African Game* was published in 1906, I sent and obtained the bullets recommended and have used them exclusively ever since. They have been completely satisfactory, not one ever having shattered, always penetrating the animal to a vital point from any angle. I have at 200 yards hit both moose and grizzly in the stern, the bullet breaking the hip and penetrating to the lungs and heart, well mushroomed, but whole. My experience is a demonstration that with the .256 it is only a question of directing the bullet at a vital spot."

The euphoria created by the 6.5's unprecedented penetration in so light a caliber and rifle weight overshadowed the failures which were blamed on poor marksmanship or ignorance of anatomy. But sour notes were soon sounded by experts. Major C. H. Stigand, the hunter-naturalist, wrote to Denis D. Lyell after he was badly mauled by a lion while using his .256. "I told you that I wouldn't lose faith in my Mannlicher 'til I had been mauled by a lion. Now I have modified my opinion. A small bore is still what I shall shoot with, for all the reasons given . . . i.e., light to carry, magazine, light cartridges, more accurate, especially for shooting standing, cheaper, etc., etc. *But* for a springing or charging (wounded) lion and for the violent animals at very close quarters, one wants a 15-pounder or large bore howitzer, or a 12-inch wire gun would be safer. The difficulty is how to exchange your small bore for a large at a critical moment."

sling straps and swivels, $1.00 per set.

THE MANNLICHER 6-SHOT HIGH POWER SPORTING RIFLE, $24.50
Caliber 8 m-m.

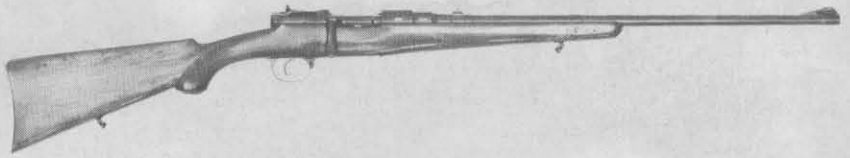
The Mannlicher Rifle is manufactured by C. G. Haenel, Suhl, Germany, and is one of the most prominent high power rifles upon the market. It has a velocity of 2,400 feet per second at the muzzle, a maximum range of 4,500 yards, and a killing range of 3,000 yards. The point blank range of the Mannlicher Rifle is 300 yards, and it is not necessary to adjust the sights within this range. If wanted for longer range it is necessary to elevate the rear sight. The Mannlicher Rifle is made from the very best material that money can buy, all parts are strong, durable, high grade, free from defective material or workmanship; each rifle is carefully tested for accuracy, high power, shooting and penetration before leaving the factory. **THE CARTRIDGES for this rifle are supplied by the ammunition companies in clips,** and in order to load pull back the breech block, place a clip in the receiver in front of the breech block, with the thumb and forefinger, press the clip into the box magazine. **To operate the gun,** turn the lever to the left, pull back the breech block, a cartridge will come up from the clip, push the breech block forward and into place, and the rifle is ready to shoot. After the five cartridges in the clip have been shot, the clip falls out from below and notifies you that there are no more cartridges in the rifle. The Mannlicher Rifle has an automatic safety at the rear of the breech block, which if you turn it to the right makes it impossible to pull the trigger until you are ready to shoot. This makes it absolutely safe and free from accidental discharge. The Mannlicher Rifle is made to carry five shots in the magazine and one in the chamber, making it a six-shot repeating rifle. It is fitted with a straight grain walnut stock, pistol grip, strong case hardened receiver and magazine, leaf rear sight, has 25-inch barrel, shoots caliber 8 m-m. cartridges, which is equivalent to 31½ caliber, and with a soft point bullet, is practically equivalent to a 45 caliber cartridge, as the soft point bullet spreads when coming in contact with game. The Mannlicher system has been adopted by the German and Austrian armies, who consider the breech bolt system the best for high power rifles.



(Clip)

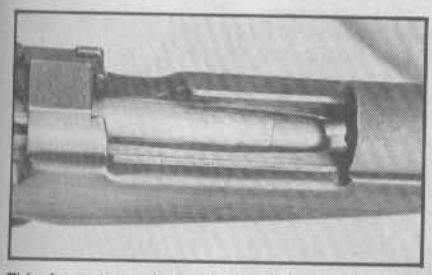
No. 6P870 Our Mannlicher Sporting Rifle, caliber 8 m-m, 25-inch barrel, weight, about 7 pounds. Price..... **$24.50**

No. 6P872 8 m-m Cartridges, soft point bullets, (come packed 25 in a box). Price, per 100 ..... **4.90**



Stripper-clip fed Mannlicher designs (top) were in great vogue in the 1890s, but were supplanted by the rotary magazine Mannlicher-Schoenauer (above).

British sportsman Capt. C.E. Radclyffe took this record Alaskan brown bear in 1903 using a Mannlicher-Haenel in 8 mm like that in the catalog shown above.



This is a top view of the Type "A" English Model Magnum Mauser action made by the Mauser Werke of Oberndorf. A .404 Jeffery round is on the follower.

Meanwhile the Nairobi, Kenya cemetery reflected the growing casualties among hunters. The first six men buried there were victims of wounded lions—the seventh was gored by a rhino. Perhaps, for all its worth, the small bore really wasn't the answer.

The 6.5 wasn't the only military "small bore" contributing to the growing bolt action trend. Other hunters flocked to buy sporter versions of the German Model 88 in 8x57J, and when the Boer War ended in 1902, thousands of demobilized British veterans became African settlers and couldn't wait to obtain a .303. Boer veterans, their views molded by the lethal success of the 7x57 Mauser, opted for sporterized versions. John Rigby & Co., Mauser's British agent, did a land office business selling 7x57 Mauser sporters which they termed ".275 Rigby-Mausers." Ivory hunters such as a demobilized Boer War veteran, a Scot named Walter Bell, found that with superior marksmanship, the steel-jacketed 173-grain round-nosed solids would reach an elephant's brain. The light report of the 6.5 and the 7x57, accuracy, lightness, penetration, magazine, clip-loading and cheapness of rifle and ammunition made Bell and kindred spirits forget the big bore doubles. Around 1903 the revolving magazine Mannlicher-Schoenauer and its 6.5x54 rimless cartridge arrived on the scene. Its spool magazine and Mauser-type stripper clip soon rendered the Mannlicher-Steyr charger clip system old-fashioned, and the Mannlicher-Steyr began to be referred to as the "old pattern" Mannlicher. Meanwhile, many others preferred to rely on big bore doubles and singles which, with Rigby's 1897 introduction of the .450 Nitro-Express, had shrunk from .875-inch to .458 caliber. Many of those who hunted dangerous game with the new sporterized military rifles and calibers *also* carried heavy doubles or singles as did Stigand and Pease, both having .450 backups.

Meanwhile, reports of failures in stopping power of the .256, .275 and .303 were piling up. The .318 Westley Richards with its .33 caliber, 250-grain bullet at 2,400 fps helped, but it wasn't enough gun for unsupported work with dangerous game. Soon after Germany adopted the "S" (spitzer) loading for its Model 98 Mauser, in 1905, giving a pointed 154-grain bullet 2,880 fps velocity, the Scottish baronet and engineer Sir Charles Ross introduced his Canadian-made Ross straight pull action and his .280 Ross rimless cartridge. It used a 145-grain copper-capped spitzer bullet at 2,900 fps and it burst on the sporting and match rifle scene with a devastating sensation, first on Scottish highland stags, then at Britain's national matches at Bisley where it swept clean. The ultra-high impact velocity of the Ross copper capped bullet created "hydrostatic shock" which dropped the stags like lightning. The high ballistic coefficients of the Ross' heavier weight match bullets at higher-than-ever velocity-for-weight ensured superior wind bucking and flatter trajectory to win at 1,000 yards. Muzzle energy based on light small caliber bullets at very high velocity became the popular index of "stopping power" for the rimless calibers. Many saw this light bullet, high energy, high velocity as superior to equal energy obtained with heavier, slower bullets.

The Ross rifle and its Bisley-winning .280 cartridge engulfed the bolt action sporter market, creating a new small bore ultra-high velocity trend. Advanced riflemen-hunters rushed to buy the Ross sporters, including George Grey, the soldier-statesman brother of Sir Edward Grey, Britain's Foreign Secretary. Captain George Grey was the commandant and founder of Grey's Scouts, a mounted unit of Rhodesia's 1896 Matabele Rebellion, reactivated during Rhodesia's 1972-'79 insurrection. Grey was the guest of Sir Alfred Pease at his ranch on Kenya's Kapiti Plains, January 29, 1911 for his introduction to the sport of "galloping" lions. "Galloping" lions consisted of spotting a lion in the open and using Somali ponies to cut the big maned males from any females, then to "gallop" the retreating lion until he turned to charge, then dismounting and firing as he charged. Grey proudly brought his new .280 Ross and was eager to demonstrate it on lion. He was a fine and cool shoot and in similar company. The entry in Sir Alfred's diary for January 29, 1911 runs in part as follows.

"I may explain that it was our practice when we had a novice or someone new to 'the game' as we played it, to take care that in every dangerous situation our guests, whether they were aware of it or not, had an experienced and deadly shot standing by. For this purpose no more reliable men could be found than Clifford and Harold Hill and our sole object this day was to see that George Grey killed a lion . . . and that Howard Pease (Sir Alfred's son) should get his first shot at one." Pease and Clifford Hill found two big maned lions and drove them towards Wami hill when Grey and the others appeared on the horizon. "The newcomers were spoiling our game, for the lions turned straight up Wami hill. I yelled

This Mannlicher-Schoenauer in 8x68S was stocked and engraved by Dschulnigg.

The author's full-length stocked Holland & Holland .375 displays top workmanship.

This English Model 8x60 Mauser was made by Mauser for export to their Nairobi agent.

This Holland & Holland .375 displays the classic lines typical of British sporters.

PHOTO BY LEONARD LEE RUE III

Despite its dense population, Europe has much game. The red stag is a favorite quarry there. Most European sporting rifles were developed for this animal.

and waved but only one of the party paid attention to my frantic efforts. Another rider, to my horror, I saw was gaining rapidly on the rear lion. Still I never dreamed that he was going to ride it down . . . Hill yelled, 'Shoot! . . . Shoot! . . . Shoot him!' I was off my horse and shouted 'Too far—300 yards!' Hill yelled 'No—200!' and fired. I saw his bullet strike up dust 10 feet short of the rear lion which had whipped around and started his charge. The charge started before I got my rifle to my shoulder . . . then it was over. I saw every detail. As the lion charged, Grey leapt from his pony and received the charge in perfect style; fired on the instant at 25 yards; again at five yards, as quick as possible with a magazine rifle in the hands of an expert.

"Those three or four seconds were ones of agonizing suspense. 'Is the lion going to drop?' . . . *Ping!* . . . the lion flying straight on . . . *Ping!* again; and Grey hurled to the ground, shaken like a rat by a terrier, and I was galloping as hard as I could to the scene. Only a few hundred yards seemed like a mile. I was conscious of my son doing the same, and by the time he and I were on our feet by the lion, Hill was there too.

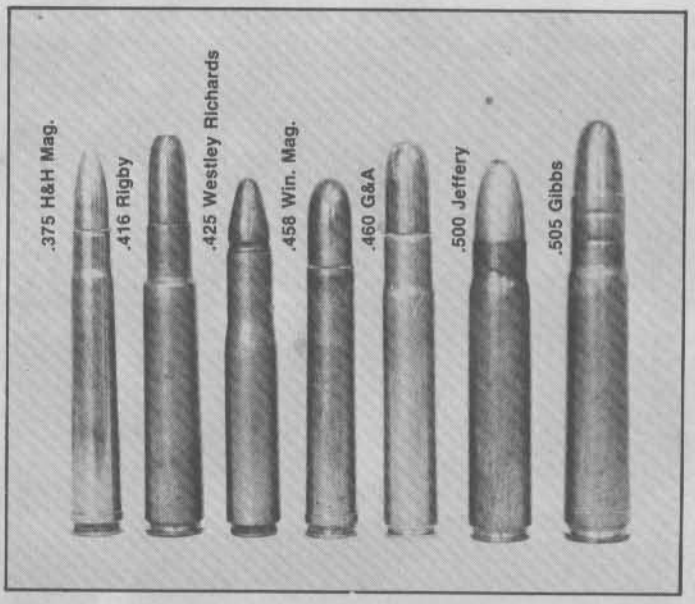
"As we arrived, the lion stopped worrying Grey for a second and glared at us. Grey was underneath. The other lion crouched in the grass close to, grunting and lashing his tail. The first lion then got hold of Grey and Hill could only fire into the lion's body, and even that was risky. We all fired. Hill's .450 bullet in the lungs practically knocked the lion out, and allowed me to put the muzzle of my rifle (.256) to his head and finish him. Hill then shouted that his rifle (a single shot) had jammed and urged me to shoot the other lion. I reckoned if I did not kill him dead he would get my son who was nearest, and thinking Grey was dead, I could not depend on myself to do it with a quick .256 shot. Then out of the corner of my eye I saw the other lion get up and start walking away. We pulled the first lion off Grey, and I knelt down beside him, thinking he was dead.

"Grey opened his eyes and spoke very quietly to me. 'I am very badly hurt . . . I want to tell you, and you must remember I say it, that I alone am to blame for what has happened.' In the same quiet way he told us how to move him and how to set about dressing his wounds. I had a water bottle and gave him a drink. His face and lips were torn down and one ear nearly off. Hill put half of my bottle of crystals of permanganate into the water bottle, and we cut off his shirt and clothes from his mangled arms and body. In a few moments we had washed over his face, head, arms, thighs and body with the solution. His elbow points were bitten right through, his hands torn to pieces, and without a syringe all we could do was to put the crystals into the deep punctures and wounds as far as we dared. Later he asked what we had done about the lion. 'Have you skinned him?' 'No.' 'Then you must skin him and take great care of the skin.' " Harold Hill galloped to the Kapiti Plains railway station and wired for a train from Nairobi which arrived by seven p.m. In the waiting room a doctor performed emergency operations on the over 60 wounds and by 2:00 a.m. Grey was in the Nairobi hospital. Sir Alfred records his final entry on the incident: "During the five days in the hosptial, he had all the care and skills the doctors and nurses could give. In those few days his cheerfulness and courage, and that something else about him which cannot be defined, won more than mere admiration from those about him. He passed away quietly on the evening of February 3, 1911. Had he lived he would have been a cripple, and even if both his arms had been saved, one would have been useless and he would have been minus fingers on both hands."

Grey apparently died thinking his "fault" had been poor shooting, but both shots had been well placed, one in the head and the other in the chest, but the 145-grain copper-capped bullets simply disintegrated. Ironically, another Grey brother, Charles, who had lost an arm in battle, was killed by a Nyasaland buffalo.

The death of George Grey rocked Britain and Africa where he was held in the highest regard, the shock waves engulfing the .280 Ross, putting a damper on its popularity and blasting the idea of small caliber, high velocity rifles for dangerous game. Others like "Karamojo" Bell continued with their small bores, but 1911—coincidence or not, marked the end of the 20-year almost unchallenged small bore, bolt action craze and a swing to medium and large bore Mausers as the right medicine in bolt persuasion for dangerous game.

The logical line of change had been started when Rigby introduced his .400/.350 rimmed nitro-express in the first magnum Mauser action in 1902. In 1908 Westley Richards had introduced their .425, the first "short magnum," and Rigby his .350



Over the years a number of cartridges have been developed for hunting dangerous tropical big game with bolt action rifles. Of the cartridges at left, the .458 Winchester Magnum and the wildcat .460 G&A are U.S. developments, and the .500 Jeffery, also known as the 12.7x70 mm Schuler, was German. The rest are British.

Holland & Holland's .375 Magnum, introduced in 1912 and shown here in an early catalog illustration, was destined to become the greatest of all the medium bores.

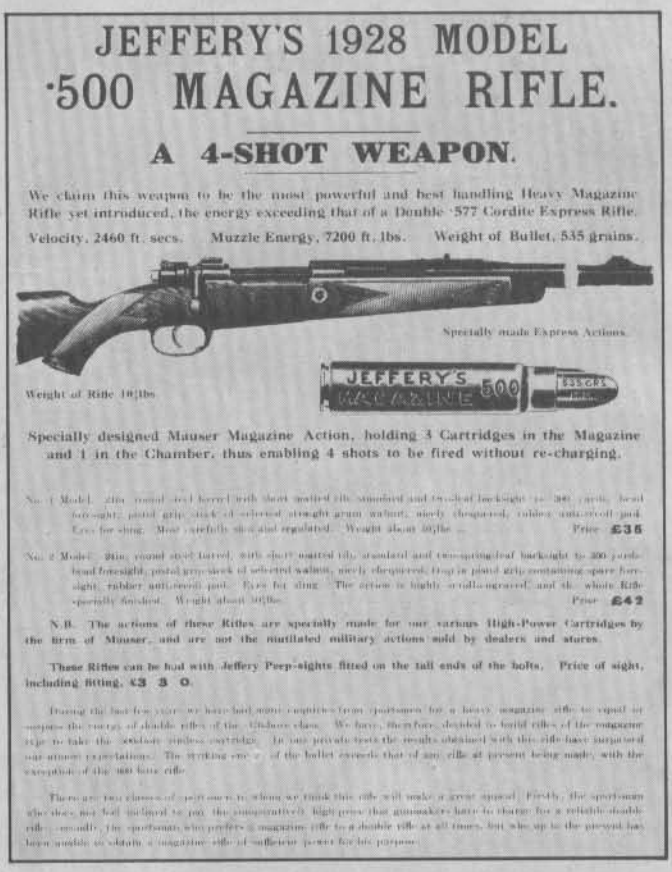
Magnum. The .404 Jeffery arrived around 1911 and the .416 Rigby in 1912. By 1912 Rigby's previously exclusive use of the magnum Mauser action ended, and Holland introduced the great .375 Belted Rimless Magnum along with the "flanged" (rimmed) version for doubles. Mauser had previously introduced its 10.75x68, .423 caliber with a 347-grain bullet at 2,260 fps and energy of 3,930 ft. lbs. The .404 with its 400-grain .423-inch bullet at 2,125 fps and 4,020 ft. lbs. energy used the new magnum Mauser actions, as did the .416 Rigby with its 410-grain bullet at 2,370 fps and 5,100 ft. lbs. energy.

The .416 was the second rimless big bore British magazine rifle round to equal the energy of the .450, .465 and .470 double rifle elephant calibers. The first, the .425 Westley Richards Magnum, was designed to fit the standard Mauser action because in 1908, the magnum action was unavailable to firms other than Rigby, Mauser's British agent. As a popular rimless Mauser chambering the 9.3x62 (.366) gained ground as an "all around" big game caliber just below the .375 H&H Magnum. The second bolt action phase, the big bore phase, was underway. Ironically, those hunters who continued to use the .256 and 7x57, etc. without a big bore backup after 1912 were regarded as "old fashioned" and "survivors" of the earlier era who refused to abandon their "old pattern" rifles for the "new fangled" rimless big bores. When Bell wrote his *Wanderings of an Elephant Hunter* in 1923, he ridiculed big bores and their advocates. "I have never been able to appreciate 'shock' as applied to killing game. It seems to me that you cannot hope to kill an elephant weighing six tons by 'shock' unless you hit him with a field gun. And yet nearly all writers advocate the use of large bores, as they 'shock' the animal so much more than small bores. They undoubtedly 'shock' the firer more, but I fail to see the difference they are going to make to the recipient of the bullet. If you expect to produce upon him by the use of big bores the effect a handful of shot had upon the Jumping Frog of Calaveras County, you will be disappointed. Wounded non-vitally, he will go just as far and be just as savage with 500 grains of lead as with 200. And 100 grains in the right place are as good as ten million." John Taylor, "Pondoro," the professional hunter and author of *African Rifles and Cartridges*, answered Bell's statement thus: "Now all that is perfectly true—every word of it. But the point is that nobody *does* expect to kill an elephant by 'shock'! Both barrels from a .600 in the belly will have little more effect on him than a single shot from a .275 (Bell's favorite) in the same place. But the 900-grain bullet in the head, even if it missed the brain by a considerable amount, would knock the elephant down and out—unconscious; whereas the 173-grain bullet from Bell's .275 bore in the same place would do nothing of the sort."

Bell's 1923 remarks on his turn of the century ivory hunting in the wilds of Karamoja described the days when the elephant roamed about by day in the open and one could pick one's shot. They were the swan song of the small bore men. Faced with mounting hunter deaths and mutilations from lion, leopard, buffalo, rhino and elephant wounded with small bores, the British Colonial game departments passed caliber regulations limiting the hunting of dangerous game from lion on up to either .375 Magnum and over or .40 caliber and over. Not a single game department adopted military small bores for control rifles for dangerous game, instead adopting .404, .425 or .416 Mausers. Dangerous game became more dangerous as man and beast contested areas chosen for cultivation and settlement. Elephant, lion and buffalo became nocturnal, and poaching and wounding from small calibers became commonplace. The military caliber bolt action sporter had changed roles in the three decades since 1890—from the favorite of rifleman-hunters to the favorite of the poacher.

World War I interrupted the introduction of more rimless big bores, but after 1918, competition between the gunmakers for the big bore magazine rifle business was widespread. Jeffery introduced his giant .500, a German-made cartridge known in Germany as the 12.7x70 Schuler with a 535-grain bullet at 2,400 fps and 6,800 ft.

Jeffery made many Mauser-actioned sporters for their .404 caliber. With a 400-grain bullet and about 4,000 foot pounds of muzzle energy, it was popular with those who preferred to use a bolt action rifle for their dangerous game hunting.



Jeffery also made rifles on the magnum Mauser action for the German 12.7x70 mm Schuler. In the English speaking world it was called the .500 Jeffery. It was the most powerful round made for repeating rifles prior to the .460 Weatherby Mag.

lbs. energy. It had a rebated rim (reduced diameter) and a short neck but it soon gained a deserved reputation for stopping power. Gibbs jumped on the big bore Mauser bandwagon in the '20s with his massive .505 and its 525-grain bullet at 2,300 fps and 6,180 ft. lbs. energy. These new big bore magazine rifles combined the multi-shot capability of the military rifle with the bone-smashing power and big bore of the heavy doubles. The pendulum had swung full circle since 1890, and by 1920, the big bore Mauser was the king of the bolt action persuasion.

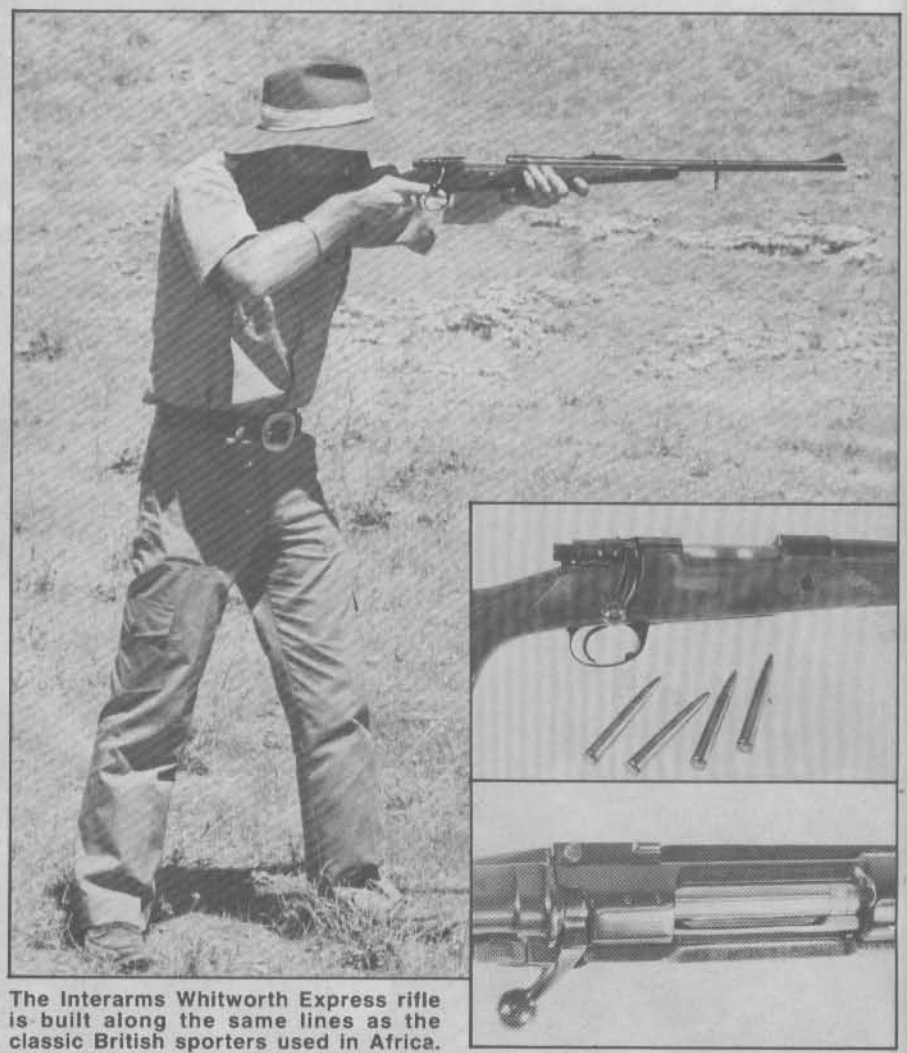
The case for the return of the big bore was ably stated by the late Sir Gerald Burrard, DSO, Bart. in his *Notes On Sporting Rifles*, fourth edition, 1953. "By adopting this line I realize that I am going against a very strongly and widely held view that some of the magnums, and even ordinary small bores, leave nothing to be desired and cannot really be bettered. It is claimed that such rifles are light to carry, easy to handle, very accurate and possess trajectories so flat as almost to eliminate the problem of judging distance. With all such claims I am in complete agreement, but I cannot forget their somewhat limited *stopping power:* they do not possess the knocking-down-flat capacity of heavier weapons, and even in scrub jungle this deficiency may cause serious trouble. In dense jungle, as I have emphasized in the preceding chapter, such deficiency may easily be fatal, and in the most literal sense of the word.

"I am fully aware that much dangerous game is killed with the small bore, but in recent years there seems to have been a gradual swing towards the medium, heavy medium and even large bores. James Sutherland, one of the most successful professional elephant hunters in Africa of his day, used a double .577 and condemned anything lighter. Mr. John Taylor is a most eloquent and staunch advocate of a heavy medium bore, preferably the .425, for all around use in Africa, and backs this advice by wonderfully sound and practical reasoning and long experience. This apparent tendency on the part of great African hunters to swing away from the small bore is most interesting, since it was in Africa that small bores were largely the vogue even for the most ponderous game."

Despite limitations for stopping dangerous game when charging, the appeal of the medium magnums, beginning with Rigby's .350 Magnum and reaching a state of perfection with Holland's .375 Magnum, became a strong trend. The .375 Magnum, especially, combined the best of the flat shooting magnums with relatively large caliber more than any other. In three rifles, two Holland-Mausers and a pre-64 Model 70, the caliber has produced more one-shot kills for me than any other. I do not think of it as a dangerous game rifle, however, but as a general purpose rifle with sideline capability for dangerous game in open country. I always carry a heavy caliber rifle in addition for the biggest or most dangerous game. My rule is that whichever rifle is in my hands *must* be capable of doing the job alone.

Despite Germany's loss of colonies in World War I, German gunmakers continued to compete—none more so than the great Mauser Works of Oberndorf, who competed in earnest with the British. Mauser even introduced an "English Model," the type "A," which was built along typical English express rifle lines and chambered for the most popular cartridges, including the .404, 10.75x68, the 9.3x62 and the .318. Schuler introduced their 11.2x72 with a 401-grain .440-inch bullet at 2,438 fps and 5,300 ft. lbs. energy. The Munich firm of Miller und Val Greiss introduced a proprietary .375 Magnum called the 9.5x73 Miller und Val Greiss Magnum, a necked-down .404 (10.75x73) firing a 271-grain bullet at 2,670 fps. It never survived because the .375 H&H Magnum did the same thing in a more compact case and offered two more bullet weights. Wilhelm Brenneke of Leipzig introduced his 9.3x64 Magnum to compete with the .375 H&H Magnum. This one proved economically viable and survived to become the most popular rimless magnum of the Continent. The 9.3x64 drives a .366-inch bullet of 286-grains at 2,650 fps for 4,490 ft. lbs. energy, a 293-grain TUG (Torpedo Universal Geschoss) bullet at 2,660 fps and 4,640 ft. lbs. energy. It is a fine general purpose round of the .375 Magnum class. Just within this class is the modern loading of the 9.3x62, another .366-inch caliber using a standard 286-grain bullet at 2,360 fps and 3,580 ft. lbs. energy, a 258-grain bullet at 2,700 fps and 4,160 ft. lbs. energy and a 293-grain TUG at 2,515 fps and 4,110 ft. lbs. energy. The current RWS loadings include a semi-spitzer soft nose 286-grain bullet at 2,280 fps, a steel-jacketed solid of the same weight for equal velocity and energy of 3,290 ft. lbs. and a 293-grain TUG at 2,430 fps and 3,840 ft. lbs. The RWS velocities are from a 23.5-inch test barrel.

The very long 8x75 rimless was a magnum developed for the African plains and was made in both "J" (.318-inch) and "S" (.323-inch) bullet sizes. The "J" (.318-inch) load fired a 196-grain bullet at 2,715 fps

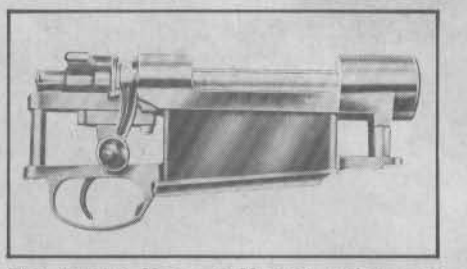


The Interarms Whitworth Express rifle is built along the same lines as the classic British sporters used in Africa.

Interarms Whitworth Express rifles are now being made in the United States on Yugoslavian Zastava actions. Formerly they were assembled in England on the same actions. These rifles are available in both .375 H&H and .458 Win. Magnum.

and energy of 3,230 ft. lbs. The "S" (.323-inch) version fired a 198-grain bullet at 3,050 fps and 4,120 ft. lbs. energy, putting it in the .338 Magnum class. The 8x75 and its rimmed brother, the 8x75R, did not survive World War II. The 8x68S is a rimless magnum using an almost identical basic case to that of the .30 Newton. In fact, one can make Newton brass from RWS 8x68S Boxer cases. It was introduced in 1940 by Dynamit Nobel in cooperation with the Steyr Works of Austria who created a special magnum Mannlicher-Schoenauer action and rifle for it. War interrupted the project, but after production at Steyr (Steyr Daimler Puch) resumed in 1950, the project was reactivated, and both rifle and ammo were put back in production. The 8x68S with its .323-inch bullet is an exceptionally powerful magnum for its caliber. It fires a 196-grain bullet at 3,050 fps and 4,045 ft. lbs. energy, a 224-grain bullet at 2,850 fps and 4,040 ft. lbs. energy, and a 187-grain "H-Mantel" bullet at 3,180 fps and 4,195 ft. lbs. energy. Today it is very popular in Europe and gaining ground in America. It is available from about all European custom makers in a variety of actions. The West German maker, Friedrich Wilhelm Heym, chambers the 8x68S in the SR bolt action and the Model HR single shot on the Ruger No. 1 action. The Belgian custom makers—Henri Dumoulin, Auguste Francotte, Mahillon and Ernest Dumoulin-Delaye—also produce rifles for it. Dumoulin-Delaye chambers it in his "African Professional," "African Ranger," "Sniper," "Centurion" and "Bavaria" model bolt actions. The "African Professional" model is a deluxe rifle in the traditional British express rifle mode with quarter rib, express sights, a drop magazine and a classic stock. The Steyr-Mannlicher models S and ST are available in 8x68S.

The contemporary European sporting rifle scene has undergone quite a few changes since World War II, with Great Britain still producing a substantial amount of production and custom rifles, minus the protectionist advantages of "Empire Preference," the Empire and Commonwealth trade bloc which favored British goods and restricted non-British goods by restrictive tariffs. Britain no longer exports firearms or ammo to South Africa, which is embargoed, nor to India, which bans the importation of firearms. But Holland & Holland, Purdey, Parker Hale, Webley & Scott and the Birmingham Small Arms Co. (BSA), among others, continue to produce guns. BSA introduced its "Majestic" bolt action rifle in the Fifties with its modern, well designed Mauser-type action, including among its chamberings a .458 Winchester Magnum with an integral muzzle brake, a French walnut stock and express sights. Parker Hale produces a .404 Mauser action sporter of African type, and Whitworth, owned by Interarms, until recently produced the Whitworth Mark X Mauser action express rifle in .375 and .458 at its Manchester works. Interarms still produces these Whitworth rifles but transferred production to their U.S. facility.



The Brevex Magnum Mauser action was made in France on captured Mauser machinery. It was a true magnum-length action suitable for the largest cartridges.

The Continentals of Belgium, West Germany, Austria, Finland, Sweden, Spain, Italy and Czechoslovakia have edged out the long-reigning British gunmakers in popularity, and with the rise of a newly affluent industrialist class in West Germany and elsewhere, the game fields of Alaska, Canada, Africa and Asia echo to the Teutonic hunter's cry of *"Waidmann's Heil!"*

Czechoslovakia, though a communist country since 1950, is one of the largest producers of bolt action big game rifles with their famous Brno modified Mausers. The ZKK-602 has the longest action of the series and is offered in .375 H&H Magnum and .458. It is an improved double-square-bridge magnum Mauser-type action with a five-shot drop magazine and integral scope rails milled on the receiver. Unfortunately Brno rifles aren't imported into the United States because of a 60 percent import duty on Iron Curtain firearms. Brnos are, however, imported into Canada where there is a Brno agent.

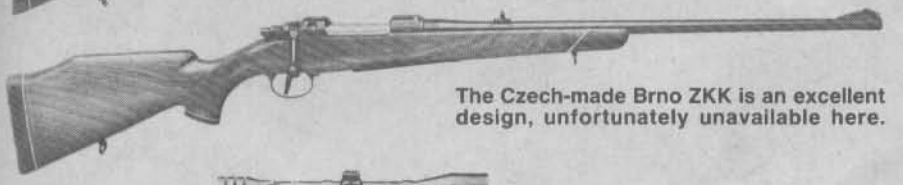
Finland's Sako has long produced rifles on long actions for the .375 H&H Magnum, and also produces rifles in .338. Sako's "Safari Grade" rifle is a special production premium rifle with a French walnut classic stock, quarter rib, express sights and a four-shot drop magazine and short forearm with barrel band sling stud. Another communist (not Soviet Bloc) country, Yugoslavia, has practically monopolized production of Mauser 98-type sporting actions and rifles with its Zavodi Crvena Zastava (Red Flag Works). These are the Mark X actions used on Whitworth and Interarms Mark X rifles and barreled actions. They are almost identical to the last of the non-rotating extractor F.N. (Series 400) actions.

West Germany's Mauser Works at Oberndorf produces a rifle with a very short telescoping action designed by champion marksman Walther Gehmann, the Model 66S Magnum. It is chambered for the 9.3x64, the .375 H&H Magnum and the .458. The Mauser Model 77 Magnum uses a more conventional turnbolt system of postwar, recessed bolt face type in 9.3x62, 9.3x64, 8x68S and a Big Game model in .375 Magnum and .458. The Colt-Sauer is an unconventional bolt action with retracting lugs, made to the high standards of the old line German firm J.P. Sauer &

The Mauser Model 66S Big Game Rifle has a unique interchangeable barrel feature.

Frankonia-Jagd's "Favorit-Safari" is made in calibers appropriate for Africa.

Among the features of the Steyr-Mannlicher is a detachable rotary magazine.



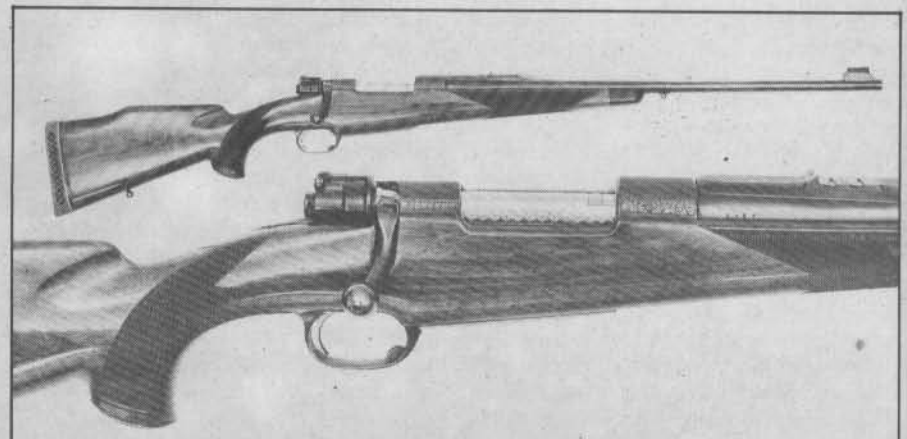
The Czech-made Brno ZKK is an excellent design, unfortunately unavailable here.

Frankonia-Jagd's "Favorit-Standard" is a typical modern 98-actioned sporter.

IMPORTED BOLT ACTION

Son. It is offered in 8x68S abroad, and the Colt-Sauer "Grand Alaskan" in .375 and the "Grand African" in .458 are the most powerful chamberings.

Austria's various Ferlach custom gun makers produce about any type of custom bolt action rifle in the big bores. The Voere Co. (not Ferlach) is a big production factory which produces a proprietary bolt action rifle in both standard and magnum versions. It is the basis of the Kleinguenther rifle imported by the Seguin, Texas firm, including the .375 Magnum among its varied chamberings. One of Europe's largest gun houses is Hofmann & Co. of Wurzburg, West Germany, doing business under the name of Frankonia Jagd, better known throughout the world as "Waffen Frankonia." Frankonia is one of the largest producers of sporting rifles in Europe, and of major interest is its production of original Model 98 Mauser action sporters. These are offered in a wide variety of stylings, including the Modell Favorit Standard in most popular calibers, including 9.3x62 and 8x68S. This basic Mauser action sporter is also available in carbine style and a deluxe version with superior walnut. The Frankonia "Safari" model comes in 8x68S, .308 Norma Magnum, .338, 9.3x64, 10.75x68, 10.75x73 (.404), .375 H&H and .458. It is a conservative African express rifle which has found considerable favor in Africa and Europe, with open express sights and a barrel band sling stud. Frankonia produces a special "Drive Hunting" model for quick shooting at driven wild boar or deer, with a new and original open sight in the form of an elevated high quarter rib with a "V" notch in the rib itself. It makes for a quick pickup when combined with the shotgun type translucent red hooded front bead. The system would be outstanding for the heavy rifle for heavy game in dense forest.



This custom Mauser in 8x68S was made by the fine Belgian firm of Henri Dumoulin, noted for its custom big bore rifles. Only its abrupt pistol grip and Monte Carlo comb detract from its otherwise pure classic styling.

Wilhelm Brenneke's firm in West Berlin, operated by his daughter, still offers bolt action custom rifles in 9.3x64 and other Brenneke and popular calibers. The Danish firm Schultz & Larsen once exported a finely finished rear-lug bolt action rifle which, for a period preceeding Weatherby's adoption of the Mark V, formed the basis of the Weatherby Magnum rifles. It was a bottom-loaded rifle, but not a slow process with practice. Unfortunately, a rear-lug system for such powerful calibers tended to cause head separations. Schultz & Larsen also produced it in .375 and .458. Before the Weatherby Mark V rifles were made in Japan, they were produced by J.P. Sauer, including the 8x68S in addition to the Weatherby chamberings.

Sweden's Husqvarna did a lot of business in the United States from the Fifties until quite recently, making a 98-type action sporter which included the 9.3x62. Though no longer chambered or in production, the .358 Norma Magnum is one of the most ballistically advanced belted magnums. As the most powerful .358 caliber cartridge of all time with a 250-gr. bullet at 2,790 fps and 4,322 ft. lbs. energy, it was on a par with the .375 Magnum. The biggest European manufacturer of sporting rifles is Belgium's Fabrique Nationale, known throughout the world simply as "F.N.," and long the main postwar source of 98-type commercial actions, barreled actions and rifles. The original postwar series 300 "Deluxe" was almost pure 98 except for the low-forged, swept-back bolt to clear low scopes. Subsequently F.N. introduced a side safety Series 400 "Supreme" action with an adjustable trigger and a different

EUROPEAN MEDIUM MAGNUM & BIG BORE RIMLESS CARTRIDGES

	Bullet		Velocity (fps)				Energy (ft. lbs.)			
Cartridge	Type	Wt. (grs.)	Muzzle	100 yds.	200 yds.	300 yds.	Muzzle	100 yds.	200 yds.	300 yds.
8x60, 8x60S	VR, TR	196	2585	2162	1890	1690	2905	2030	1560	1245
	TIG	198	2780	2450	2205	2010	3390	2625	2130	1770
8x64, 8x64S, 8x65RS	VR, TR	196	2680	2240	1940	1730	3120	2180	1640	1295
Orig. Brenneke	TIG	198	2830	2480	2230	2030	3520	2700	2180	1790
8x68S Magnum	HMK	187	3180	3030	2880	2730	4195	3810	3440	3095
	VM	196	3050	2840	2650	2480	4045	3510	3055	2675
8x75	KS	224	2850	2710	2580	2450	4040	3650	3310	2985
	VR, TR	198	3050	–	–	–	4120	–	–	–
.358 Norma Magnum										
Soft point semi-pointed		250	2800	2493	2231	2001	4322	3451	2764	2223
9.3x62	VR, TR	285	2360	2010	1775	1605	3540	2570	2000	1620
	TUG	293	2515	2310	2150	2020	4110	3480	3010	2634
9.3x64 Orig. Brenneke	VR, TR	285	2750	2240	1930	1730	4790	3180	2365	1895
	TUG	293	2640	2450	2290	2145	4550	3900	3410	3000
9.5x73 Miller & Greiss Mag.	VR, TR	271	2670	–	–	–	4310	–	–	–
10.75x68	VR, TR	347	2190	1950	1750	1580	3690	2920	2370	1950
10.75x73 (.404 Jeffery)	VR, TR	401	2330	2010	1800	1650	4840	3585	2885	2430
11.2x72 Schuler	VR, TR	401	2438	–	–	–	5300	–	–	–
12.7x70 Schuler										
(.500 Jeffery)	VR. TR	535	2400	–	–	–	6800	–	–	–

VR—solid point, round nose
TIG—Brenneke Torpedo Ideal Bullet (soft point)
TUG—Brenneke Torpedo Universal Bullet (soft point)
VM—steel jacket, R.N. solid
KS—cone point spitzer
HMK—H-mantel copper capped
TR—soft point, round nose

The "Golden Eagle" was a modern design for magnum calibers. It was imported from Japan.

Guns & Ammo Books **Editor Craig Boddington took this monstrous Alaskan brown bear that squared over 11 feet using a Sako Safari Grade chambered for .375 H&H Magnum.**

The long-action Sako, shown in its Deluxe Grade, comes in both .375 H&H Mag. and .338 Win. Mag.

bolt sleeve. This was basically the action used on the F.N.-made Browning "Safari" rifles, which among their many chamberings included the .375, .338 and .458. The main internal difference between these F.N. and incidentally the Yugoslavian Zastava (Mark X) actions and the original 98 is that the left lug raceway slot is broached all the way through the receiver ring, but on original Mausers it is left solid. In the Sixties the F.N./Browning Mauser action was modified to cut costs by going to a recessed bolt face and a snap-type rotating extractor. The F.N. Browning is no longer made and Browning imports its bolt action centerfire BBR from Japan. In recent years the Japanese have moved to take a substantial share of the centerfire and rimfire rifle market as they have done with shotguns. Until recently, their "Golden Eagle" bolt action was offered in popular calibers, including .338, .375 and .458.

Because of the arms embargo against South Africa, that country has developed a formidable military and sporting arms industry under the aegis of ARMSCOR, the state arms-making corporation headed by Commandant Pieter Marais. In Bloemfontein, Orange Free State, the firm of Musgrave & Sons produces excellent sporters in popular calibers, including .458. Musgrave has developed their own Mauser-type bolt action which is a mix of original Model 98 and pre-64 Model 70 Winchester features.

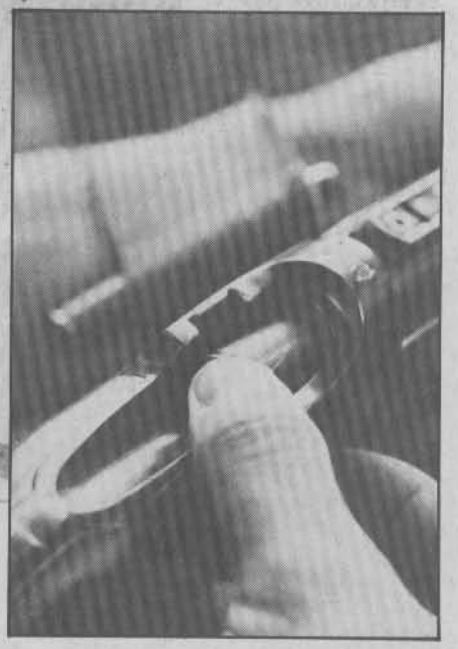
As was the case in prewar days, Europe is again a great producer of bolt action sporting rifles, but the most popular cartridges, with few exceptions, are American, including the .338 and .458 Winchester Magnums. But despite the many action design changes, the purist can still find custom firms in Britain or the Continent who will make a traditional big bore express rifle on a Model 98-type action, or an original prewar Mauser action from the many shot-out sporters which surface. For a few years the Brevex Magnum action based on the original Mauser magnum action was made in Paris on original Mauser machinery captured by the French at Oberndorf and imported by Tradewinds. But since the death of M. Polonski, the manufacturer, the massive and well made Brevex has vanished into history along with its Oberndorf predecessor. However, the big bore bolt action traditionalist remains an unendangered species. Should somebody produce an over-the-counter magnum bolt action worthy of the great magnum Mauser actions, or the Brevex, there is a steady and ready cadre of the faithful waiting to plunk down hard cash. But it must be of sufficient size and brawn to handle such longtime greats as the .416 Rigby and that "big tusker," the .505 Gibbs—that monstrous fossil of Africa's "golden days" which Ernest Hemingway claimed was responsible for famed professional hunter "Papa" (Phillip) Percival's deafness!

BRITISH MEDIUM MAGNUM & BIG BORE CARTRIDGES FOR MAGAZINE RIFLES

Cartridge	Bullet (Grains)	Velocity (fps)				Energy (ft. lbs.)				Approximate Rifle Weight (lbs.)	
		Muzzle	100 Yds.	200 Yds.	300 Yds.	Muzzle	100 Yds.	200 Yds.	300 Yds.	D.B.	S.B.
.500 Jeffery (12.7x70 Schuler)	535	2400				6800					11
.505	525	2300	2020	1790	1550	6180	4760	3740	2810	10½-	-11
.425	410	2350	2120	1910	1710	5010	4100	3330	2660	9½-10½	9-9½
.423 (10.75 mm)	347	2200	1950	1710	1500	3750	2940	2260	1740	9-9½	7¼-7½
.416	410	2350	2150	1960	1780	5010	4220	3500	2900	–	9¼-9½
.405 Winchester	300	2200	1940	1690	1470	3240	2510	1910	1450	–	8½-9
.404	400	2125	1930	1750	1580	4020	3310	2730	2200	–	8½-9
.375 Magnum (Belted Rimless)	235	2800	2510	2230	1950	4100	3300	2600	1990	–	8-9
.375 Magnum (Belted Rimless)	270	2650	2430	2210	2000	4220	3550	2930	2400	–	8-9
.375 Magnum (Belted Rimless)	300	2500	2300	2110	1920	4160	3530	2960	2460	–	8-9
.350 Magnum	225	2625	2380	2140	1900	3450	2750	2300	1810	9-9¼	7¾
.400/.350 Rigby	310	2000	1795	1610	–	2760	2220	1790	–	9-9½	8½
.333 (Rimless)	250	2500	2300	2120	1930	3470	2940	2500	2070	–	9
.333 (Rimless)	300	2200	2030	1860	1700	3240	2750	2310	1930	–	9
.318	180	2700	2440	2190	1930	2920	2390	1920	1490	8½-9½	7¼-8
.318	250	2400	2210	2030	1850	3200	2720	2290	1910	8½-9½	7¼-8

CHAPTER 7

SINGLE SHOT STOPPING RIFLES

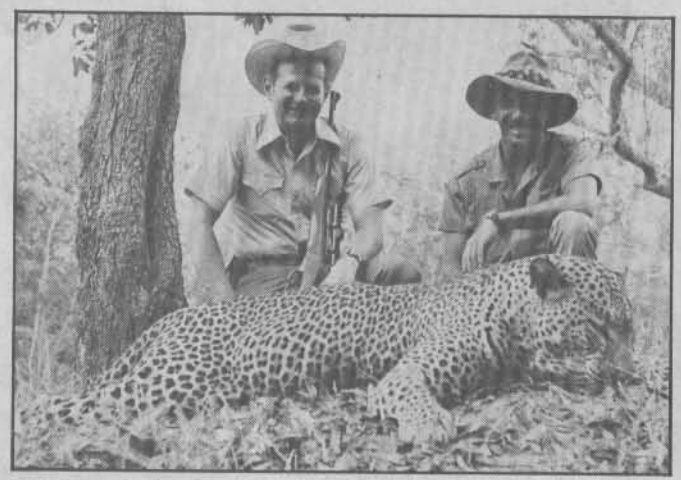


Ruger's fine No. 1 has given single shot rifles a new lease on life for big game hunting. Under the right circumstances, the author believes that in .458 it can be a good choice for dangerous big game.

When Bill Ruger introduced his Number One rifle, he proved two things—the one-shot tradition is alive and well,* and *the single shot remains a fine choice for hunting!

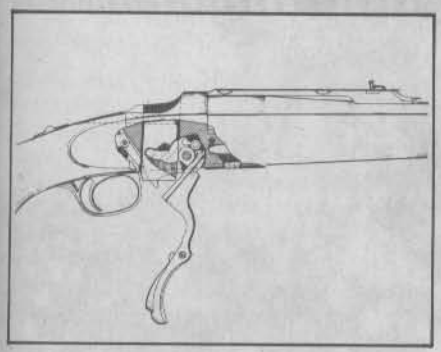
The modern falling block single-shot actions for truly powerful big bore cartridges are the direct descendants of the great Sharps buffalo rifles of the 19th century. All really powerful single shots are based on the falling block system, if we exclude hinged boxlock and sidelock systems and bolt actions for match shooting minus a magazine with a solid wall bottom for rigidity. Such bolt actions are really repeater actions modified for single-shot target use rather than true single-shot actions such as the Ruger No. 1 or the Winchester High Wall. Curiously, there has never been a time when single-shot rifles for big game have been so mass produced and marketed as today, especially considering Ruger's incredible success with their outstanding No. 1 falling block action. Back in the late 19th century, the falling block Alexander Henry external hammer action and the Gibbs-made Farquharson actions were the most celebrated of the British actions. In America, the Sharps-Borchardt and John Browning's Winchester single shot represented the highest forms.

Whereas the turn of the century was the dividing line between the black powder era and the smokeless era, the falling block single shot was only just reaching its peak of development, especially for the most powerful of the new smokeless nitro-expresses. The Winchester single shot was introduced



Noted gun writer John Wootters took this big leopard in Mozambique with a Ruger No. 1 Medium Sporter in .45-70 Government.

This Cape buffalo dropped to Jon Sundra's Ruger chambered for Jon's .375 JRS wildcat based on the 8 mm Rem. Mag. case.



The Ruger No. 1 has the elegant lines of the old British Farquharsons, but its mechanism (left) is a very different and totally modern single shot design.

around 1885. One of John Browning's earliest designs, it was very popular. Its commercial success, ironically, occurred well after the age of repeating rifles had commenced. The Winchester single shot High Wall and the "High Wall/Thick Wall" (High Wall but with sides left thicker) had some really powerful chamberings, and since production ceased in 1920, High Walls have been sought for making both wildcats and standard caliber single shots.

Meanwhile, the British took the Farquharson concept to even greater heights and developed some of the strongest and most outstanding falling block actions ever made. The Westley Richards falling block action was very strong and very popular for large bore nitro-express cartridges such as the .450/.400, .450 3¼-inch Nitro-Express and even the .425 Westley Richards Magnum designed for Mausers. Many of these Westley Richards rifles were on their detachable barrel takedown system. But the high point of British single-shot falling block development came in 1902 with the advent of Webley & Scott's massive and fine 1902 Webley action for such heavies as the .500, .577 and .600 Nitro-Expresses. As with their boxlock actions for double-barreled rifles, Webley furnished their 1902 falling block actions "in the white" to other firms such as W.J. Jeffery, John Rigby, Greener, Bland and others. Holland & Holland introduced their patented falling block action for their .500/.450 Nitro-Express around the turn of the century, subsequently using it for their .500/.465 "India" single shot.

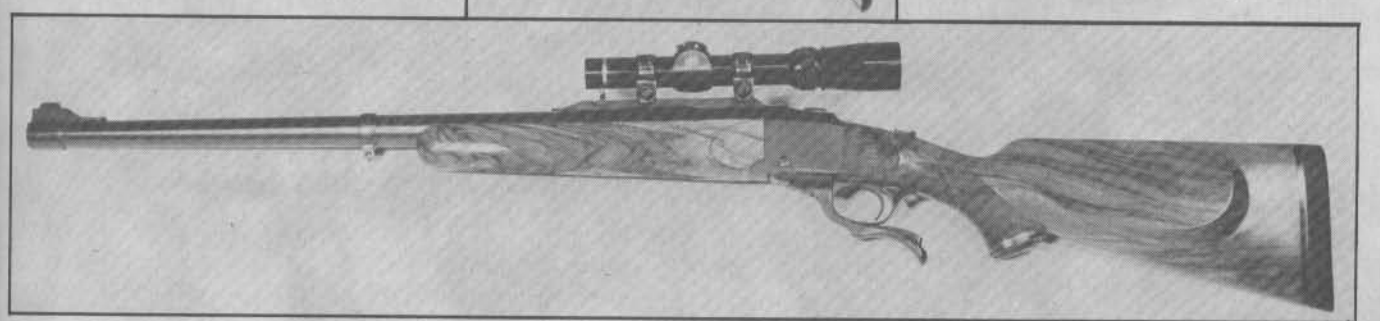
It should be pointed out that although such single-shot falling block rifles were cheaper than doubles, they were not cutrate affairs, but relatively expensive handmade custom rifles, usually engraved and with fine French walnut stocks, gold-inlaid safeties and hand-filed "dress parade" express sights with platinum centerlines. They were substantially more costly than bolt action sporters for military calibers, but, of course, many did opt for such fine falling blocks because they were the next best option to a double rifle which many could not afford, especially young Sandhurst graduates on their first posting to an Indian regiment or the King's African Rifles. Falling blocks are extremely short for a given barrel length—easily 4½ inches shorter than a bolt action rifle of equal barrel length. The lever-actuated falling block action is also more rapidly opened for reloading than a double rifle, which requires that the barrels be dropped carefully until the extractors have fully extended or ejection occurs. After reloading the double, the barrels must be swung back through a wide arc and carefully closed, with the eyes normally taken off the game while reloading takes place. With the falling block, the jerking down of the lever and inserting a fresh round is by far a quicker process and one's eyes do not have to leave the game.

The Ruger No. 1 action is a favorite for custom work. The splendid sporter below and the elegantly engraved action at right are by Don Klein Custom Guns.

The big bore single shot is also lighter for a given caliber than a double, and no problem of regulating two barrels to shoot to a common point of impact occurs. Falling block single shots are easy to inspect for barrel fouling and obstructions and are the easiest to clean from the breech with a minimum of mechanical action. The falling block is also much stronger than the double rifle, and in those times of weak brass cases and high pressure curves, the falling block system had the best gas protection for the eyes of any single-barrel action, including Mausers. The negative of the falling block single shot wasn't its one-shot capacity, but its inferior extraction leverage compared to bolt actions or doubles. With double-barreled actions, the dropping of the barrels and the length of the barrels themselves acts as a long lever to drive the extractors, but with the falling block, it is only the finger lever which does the job, though with compound leverage.

With today's heat-treated and elastic high-tensile strength brass cases and progressive-burning nitrocellulose smokeless powders, extraction problems with such advanced falling block actions as the Ruger No. 1 are almost unknown. When they occur, it is invariably due to overloaded handloads by inexperienced or incautious handloaders. Around 1900, pierced primers, head separations and hard extraction were common complaints of tropical hunters, especially when tropical temperatures drove up pressures and the inelastic brass of those days simply froze tightly to chamber walls. But with the big straight-tapered Nitro-Express cases such as the .500 three-inch, .500 3¼-inch, .577 2¾-inch and three-inch or the .600, the pressures were much lower, and due to no bottleneck constriction there was less sidewall pressure on the brass. But with bottlenecked cases and cordite or nitrocellulose or Axite powders this was a serious problem, not only for single shots, but for Mausers, Mannlichers and doubles.

With a pair of heavy .577 three-inch Nitro-Express falling blocks on the massive Webley 1902 action and a magazine rifle for a military caliber and solids, the ivory hunter could down two elephants by passing his empty single shot to his loader who, with a synchronized movement, put a freshly loaded twin rifle in his hands. Such an exchange could be kept up as long as needed such as in big herds, and any downed bulls could be given the *coup de grace* with the Mauser's steel-jacketed sol-



ids. This is a very efficient and rapid system, and with a cool and good shot who has mastered speed in reloading his falling block, matched with a cool and efficient loader, it could be about as fast as using a pair of doubles, which are slower to break open, load and close.

A number of prominent big game hunters preferred the falling block, including T.R. Hubback, who used a .450 Bland in Malaya, and Captain B.R.M. Glossop, who used a .450/.400 Holland. Both Elmer Keith and the late John "Pondoro" Taylor liked and used falling block Farquharsons, Webley 1902s and Westley Richards'. Taylor believed that magazine rifles should be barred in sport hunting and that a maximum of two shots per rifle be permitted to ensure more accurate placement. Taylor suggested that magazine rifles have a magazine capacity of "one and a half" rounds, meaning two in the magazine but the bolt able to be closed only over a single round. The "half" loading was so the top round could be picked up and fed into the chamber by the bolt. From his book *African Rifles and Cartridges* are these remarks: "Personally, however, I would much prefer the falling block single loader. With this type of weapon there is no rushing the shot in the hope of getting another; if you are given a second, there is again no rushing it, because it would be unreasonable to expect a third. The result is that each and every shot is fired as it should be and a clean kill eventuates. That curious psychological factor which seems to arise when a man knows he has three or four shots in immediate reserve would not appear. I can't think why a man shooting solely for sport and pleasure should want to make a big bag at a 'sitting'."

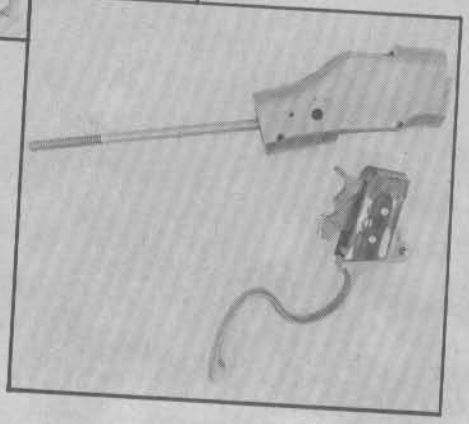
Taylor continues on this theme: "With a scope sighted single loader you should get your beast every time. It would teach you to take the greatest possible care with every shot you fire, and this would mean fewer wounded animals. And look at the vastly greater satisfaction your hunting would give you if you knew that you were a one-shot killer. . . . But by far the greater part of my shooting has been done with doubles and single loaders. And my experience has been that if the gods are on your side that day, you'll get your several beasts just as surely with a single loader as you will with any magazine—and remember, I write as a professional who has all too often had to shoot for quantity rather than for quality."

I was tempted to omit what the late Major Sir Gerald Burrard, Bart., D.S.O., R.F.A. (Retired) said in criticism of falling blocks for fear of discouraging their use. But it is an interesting and typical turn of the century criticism of falling blocks with the weak and nonelastic brass of those days and steep pressure curves combined with India's stifling heat. In his *Notes On Sporting Rifles* (Edward Arnold, London, 1953) Burrard says: "The Farquharson falling block's weak spot was the primary extraction because the leverage for unseating a tightly expanded fired cartridge case from the chamber was inadequate. Ideal for black powder, with its lower pressures which were unaffected by high temperatures, it failed with cordite cartridges in tropical heat, and I remember how in the plains of India in June, I was sometimes compelled in desperation to borrow my shikari's small axe and use the back of this as a hammer for easing the lever, a procedure which cannot be recommended in spite of the use of a handkerchief as a pad to reduce the risk of bruising the metal. Yet this same rifle never gave any difficulty, or anything but outstanding efficiency, at high altitudes in the Himalayas at the same season of the year. I need hardly say that I never used this rifle in the plains for dangerous game. It is because of this weak spot in this otherwise splendid action, which was both quick and silent, that it has gradually become obsolescent if not quite obsolete, at any rate, as heavy rifles are concerned."

Burrard was Britain's greatest firearms expert of the smokeless era, but he erred here in not saying that he was referring to a falling block for the .280 Flanged version of the famous .280 Ross rimless cartridge, a Lancaster he bought in 1910 which he mentions elsewhere in his book. As for his refusal to use it on dangerous game, I

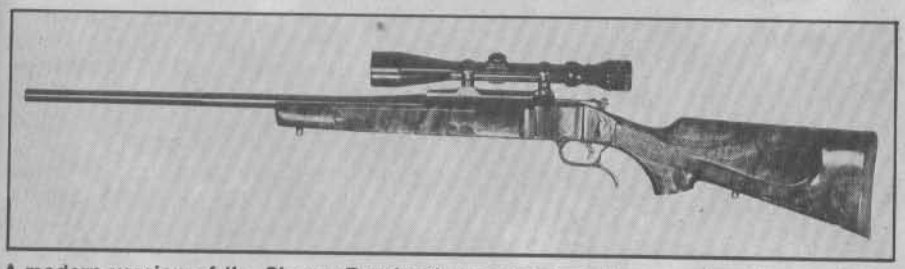
Elmer Keith, *G&A's* Executive Editor and the "Dean of American Gunwriters," has long been partial to single shot rifles and developed his own .338x74 Keith wildcat especially for single shots. Here he is testing the presently defunct Wickliffe '76 falling block in .45-70 Gov't. Elmer printed tight groups with the Wickliffe (right).

The single shots of yesteryear have been the subjects of attempted revivals. At left, John Wootters tests an experimental Sharps Borchardt. The Winchester High Wall falling block (below) has also had its modern imitators.

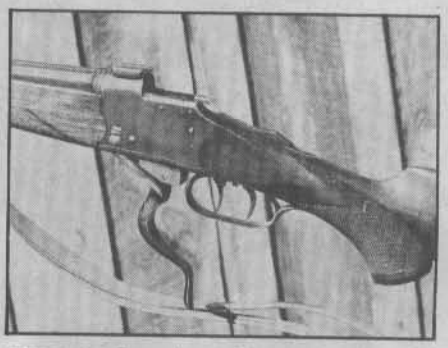


would think that its caliber alone would decree that. With the poor brass of those days and the very high pressures of the .280 cartridge, especially in the extreme heat of India's plains in June, it's no wonder he had those problems. But with the straight-tapered cases of the .500 and the .577 with their lack of a bottleneck and much lower pressures to begin with, Burrard's extraction difficulties probably would not have occurred with such ammunition even in those days. My point is that today's outstanding heat-treated brass, gradual pressure curves and lower peak pressures have generally overcome such troubles as those which plagued early 20th century falling block users for smokeless high-velocity cartridges. I can say that I have fired both my .375 H&H Magnum Ruger No. 1 and my .458 Ruger No. 1 in 95 to 100 degree, dry, baking Southern California heat with no sign of extraction difficulty. I won't say it can't happen with a handload and a few grains too much propellant, but I will gladly gamble on it not occurring today with factory ammo or a handload reaching factory or near-factory pressures.

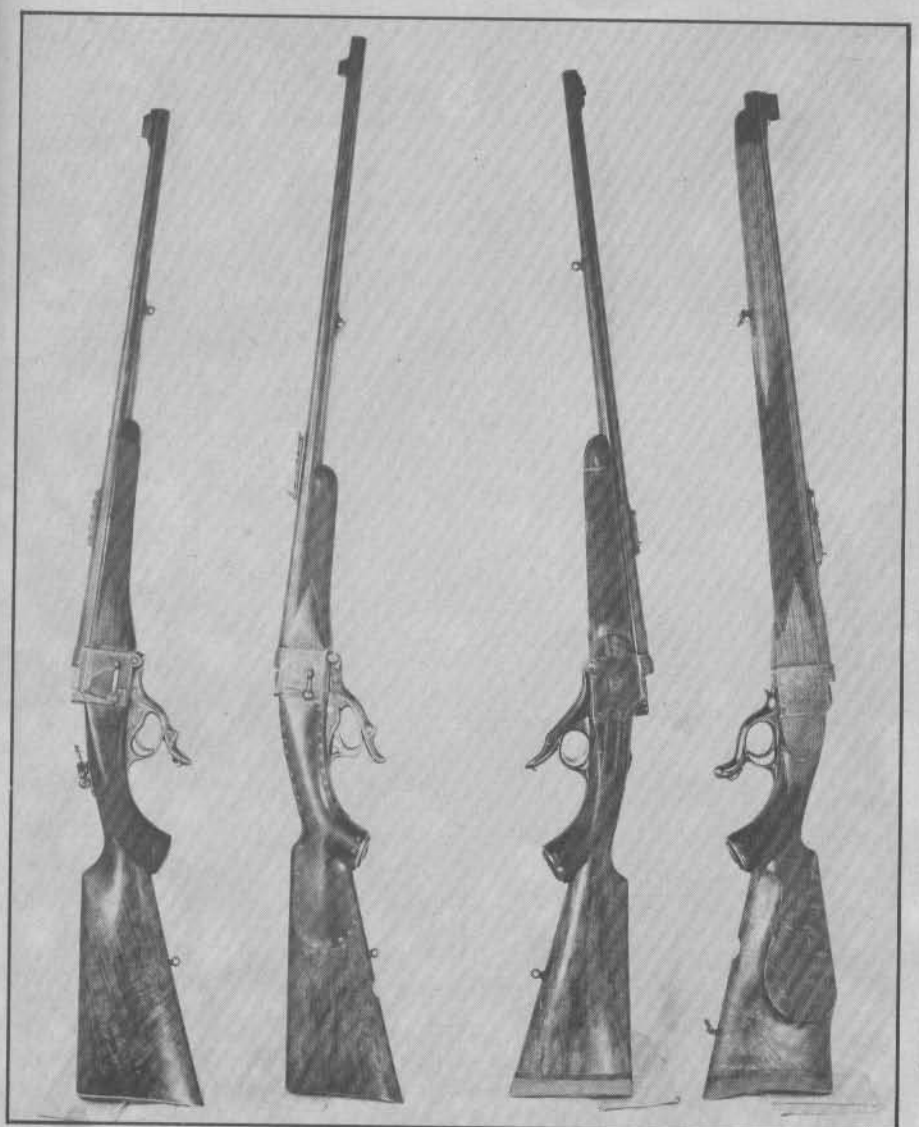
One of the greatest advantages of falling blocks is their ability to chamber a cartridge which is too long for a magazine, such as too long a bullet or one seated out extra far. Another advantage is that soft-nosed bullets don't become battered in a single-shot rifle as they do in a magazine from recoil which upsets lead noses. The various kinds of jams common to magazine rifles are nonexistent with single shots, but, of course, *you* have to be the "repeating system" and repeat shots with the single-shot falling block will be as good and as rapid as one's speed and efficiency can achieve. From a technical standpoint, Ruger's engineers seem to have solved the design problems in creating an efficient extraction and ejection system for the No. 1 action.



A modern version of the Sharps Borchardt was developed over a decade ago. A few prototype rifles appeared. Colt bought the rights but hasn't made the rifles yet.



European firms have also made a number of single shot rifles on the falling block principle. This one with double-set triggers was made by Krieghoff.



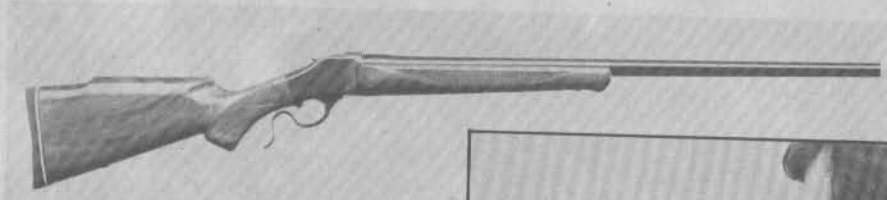
Elmer Keith is a fancier of the great British single shot rifles. These rifles on the Farquharson and Webley actions are all from his extensive collection of fine guns.

The shortness in overall length of the falling block single shot such as the Ruger No. 1 is such that a 24-inch barreled Ruger No. 1, Farquharson or other typical falling block single shot is easily 4½ inches shorter than a bolt action rifle of equal barrel length. This makes for wonderful carrying and shooting balance, like that of a double shotgun. It also helps when hunting in thick cover, but meanwhile doesn't reduce valuable barrel length causing a velocity loss as with bolt action rifles and 22 or 20-inch barrels. The system makes a fine choice for the left-handed shooter, and the tang safety of the Ruger is the fastest of all. I like the ease with which the breech block is dropped for cleaning and inspection without removing a bolt or, as with doubles, without taking down the gun. It is the easiest and safest of all breech actions to load and unload and to check if loaded. Bore sighting is also easy with a falling block action.

Today we see the flowering of a single shot renaissance which began after World War II, probably with Wilbur Hauck's falling block action. Hauck, a West Arlington, Vermont custom gunsmith, designed his action for target and woodchuck shooting, but his action is for any caliber the Ruger No. 1 can use. In many ways it is similar to the Ruger No. 1, since it used a heat-treated chrome-molybdenum steel action with a through-bolt for securing the stock to the action, dispensing with the upper and lower tangs and employing a Duralumin "hanger" to suspend the forearm from

the receiver to avoid erratic vibrations. By so doing, Hauck avoided most of the bedding problems which heretofore had plagued falling blocks in competing with bolt action rifles.

"Bo" Clerke made modern reproductions of the Winchester High Wall action which are now out of production, but Clerke is readying a single shot of match quality for near future production in a new plant in California. The Sharps Rifle Co. of Utah, guided by P.O. Ackley, had made a few sample Sharps-Borchardt actions but sold the setup to Colt, and apparently this project remains in suspension. The market for powerful falling block rifles is widespread, as is evident from a perusal of catalog sections of gun annuals, including the Browning B-78 rifle, reminiscent of the Winchester single-shot High Wall, but a new action and rifle made in Japan. The recently introduced Hagn action from Germany, the Riedl action and rifle, the Wickliffe, the Hyper, the De Haas-Miller action and those made by the Falling Block Rifle Company all serve to mark the trend. The German Heeren falling block action as made by Zurich, Switzerland's Waffen-Glaser, has long been a favorite of Teutonic single-shot devotees as well as a select coterie of American connoisseurs of the finer examples of single-shot persuasion. The Heeren is operated by pulling the trigger guard down at the front.

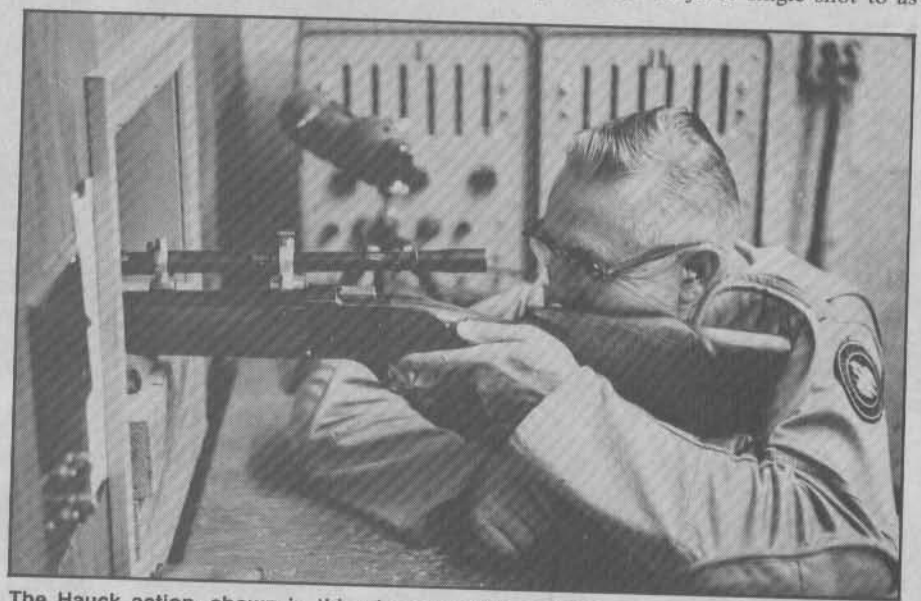


The Browning Single Shot, made in Japan, was closely patterned after the old Winchester High Wall design. This fine rifle has recently been discontinued.

The Austrian Ferlach makers and some German makers produce great single shots of drop barrel type with top levers and shotgun or double rifle-type boxlock or sidelock actions. These "Karpathenbuchse" single shots are best described as "half-double rifles" since they break down and are hinged in operation exactly as doubles. They invariably have integral barrel fasteners of the Greener (single crossbolt) or Kersten (double crossbolt) type, express sights, quarter ribs, and Suhler (claw) mounts. Such single shots are custom rifles in the strictest sense and are a consistent standby of the Germanic gunmakers. One of their advantages is that, like double rifles, they can be taken down for suitcase or trunk packing for air travel.

My friend John T. Amber, Editor Emeritus of the *Gun Digest*, is probably the world's leading authority on single shots, having collected more fine specimens and written more informed articles on them than anyone else I know of. John tells me in a recent letter that the Hagn action is being produced by the Hamburg, West German custom gun firm of Hartmann & Weiss. They are one of Europe's finest custom gun firms and are tooled up to produce the Hagn actions on a semiproduction basis for sale at around 2,000 Deutch Marks or about $800. It is a finely made, hand-finished action for all standard centerfire cartridges. John writes that Martin Hagn, the designer and former Alaska gunsmith, was recently in the States on an Alaskan hunting trip. Hagn left a Hartmann & Weiss rifle with his action in Amber's hands for sale at $4,000. It is the first rifle produced on the Hartmann & Weiss version and rather than take it back to Germany he would sell it here. John says: "I thought, boy, that's a lot of dough, but the next day UPS delivered it and I can easily see the price. The wood is the fanciest, curliest hunk of French (?) walnut you can imagine—more like the best custom pipe briar—fore-end to match, both well and fully checkered, but with diamonds flat, a la British fashion. The full-octagon Ruger No. 1 progresses apace. Some custom makers like Don Klein, P.O. Box 277, Camp Douglas, WI 54618 and Paul Jaeger, Inc., 211 Leedom St., Jenkintown, PA barrel has a low-rise integral matted rib with the aft section forming the bases for a bottom rail scope mount. *Not* a Suhler-type, but functions like a Redfield (West German EAW mount)—the scope ring foot enters a front opening at 90 degrees, then is rotated that much and is locked with a short lever into the low rear section of base. Scope off a very low profile. A gold band is let into the barrel at the breech. The action, lever, steel grip cap, etc. are scroll engraved, English style, no butt pad—the wood is checkered. Nice front ramp sight too, with a gold centerlined folding leaf. I wish I could own it, and if I were five or seven years younger I'd try to buy it. I haven't shot it but I'd like to see what it will do. Pretty well, I'd bet."

One of the reasons for the increase in interest in single shots for big bores and all centerfire calibers is that their action sidewalls provide plenty of engraving area. Heym of Munnerstadt, West Germany makes their very fine Heym-Ruger HR 30/38 single-shot "blockbuchse" on the Ruger No. 1 action in 8x68S, 9.3x74R and just about everything else. It comes with a Bavarian-style stock and can be had fully engraved and with ribbed and octagonal barrels and a Canjar set trigger. Heym will finish up this *tour de force* single shot to as lavish a degree of engraving, gold or silver inlays and fancy wood as one's heart desires. Meanwhile, the British are also turning the clock back to those halcyon days when they made the world's finest single shots, by turning out custom express rifles on the Ruger No. 1 action. In this country, the same rush to build custom rifles on the



The Hauck action, shown in this chronographing photo, was a custom made action produced in the 1950s. It could be considered a forerunner of the Ruger No. 1.

Ruger No. 1 progresses apace. Some custom makers like Don Klein, P.O. Box 277, Camp Douglas, WI 54618 and Paul Jaeger, Inc., 211 Leedom St., Jenkintown, PA 19046, specialize in building beautiful custom express rifles on the Ruger No. 1 This action is one which lends itself naturally to the building of a fine custom rifle, with its graceful but purposeful lines. So nicely is the factory No. 1 turned out that with but a modicum of skilled handwork a near-custom rifle can be created. The wood on both my No. 1 Tropical Rifles in .375 H&H Magnum and .458 is so fancy as purchased that no custom stock is needed. The late Lenard Brownell's stock design is both beautiful and functional, and the Alexander Henry fore-end and the quarter rib with integral scope mount bases are remarkable for a factory rifle. The whole aggregate of quality is more what one would expect from a custom rifle than from one out of the box.

Another advantage of the Ruger No. 1 single shot and other falling block actions is that they make superb stalking rifles which are silent in operation when non-ejectors, and for open country hunting with a scope, rapid fire is not needed other than in unusual cases. I know of no other breech system which provides such outstanding eye protection against escaping gas, should the unusual but not rare occur, and a primer become pierced. The falling block system also happens to be one of the strongest, along with bolt actions. Time after time one reads or hears bolt actions compared in their individual gas control and case head supporting capabilities, but none compare with the modern falling block as exemplified by the Ruger No. 1 and similarly breeched falling blocks. With such an action, the entire case is enclosed by the chamber walls of the barrel and sealed off by the breech block. This is because the breech block must be free to move up and down when actuated. The next time you examine a Ruger No. 1, take a look at the chamber and note the amount of the cartridge case head surrounded by the barrel and sealed off by the breech block.

Would I use a single shot for hunting dangerous game, and do I recommend others using them for such game? Before replying, I reserve the right to add some caveats. Yes, I not only would use a modern falling block single shot for dangerous game, but I recommend that others do so, if they desire. That is, I recommend it if the single shot is chambered for a suitably powerful cartridge at the top level of power for the game hunted, and if the hunter is not only a good hunter and marksman, but also expert in rapid reloading. For the Alaskan or African hunter guided by a capable and well-armed guide with a heavy backup rifle of double or Mauser persuasion, a suitably powered single shot makes a fine choice. I believe, as did John Taylor, that one is apt to be more careful with that first shot, especially since it is the *only* shot in the rifle. With the best falling block rifle you have many advantages over the magazine rifle, if you exclude the one so-called disadvantage—the one-shot capacity. Your rifle will be shorter by over four inches than a magazine rifle of equal barrel length, like a double rifle, and many have the double's shotgun safety and its silence and speed. Each trophy you take with such a rifle will have another source of pride—a one-shot kill with a one-shot rifle!

Savvy users of single shot rifles have devised numerous tricks to speed up reloading. Among them are ammo clips attached to the epaulets of a safari jacket (above left), holding spare rounds between the fingers (above) or employing a wrist band (at right).

A correspondent, Mr. Rick Halstead of New Mexico, has had great success in having a variety of Ruger No. 1 rifles rebored and rebarreled for various British nitro-express cartridges and metric calibers. It is easy to see why this action makes such conversions feasible, with no magazine or feeding to bother about. This is where so many such modifications of bolt action rifles founder, in making the action and magazine feed a cartridge other than that for which it was originally designed. No such problem exists with the falling block action such as the Ruger No. 1. Another advantage is the ease with which such a rifle can be converted to handle a much longer cartridge simply by rechambering. For example, the easiest way to obtain a .404, or wildcats on the .404 or full-length .375 H&H case, is to buy a Ruger No. 1 Tropical Rifle and rebore, or in the case of the .460 G&A, one buys a No. 1 Tropical Rifle and rechambers for it, This is also the easy and cheap way to build a .416 Van Horn or .423 Van Horn, by reboring a .375, or one can rebore a .458 to .475 and rechamber to the .475 Ackley or the .475 Barnes Supreme. The possibilities for the wildcatter are almost unlimited.

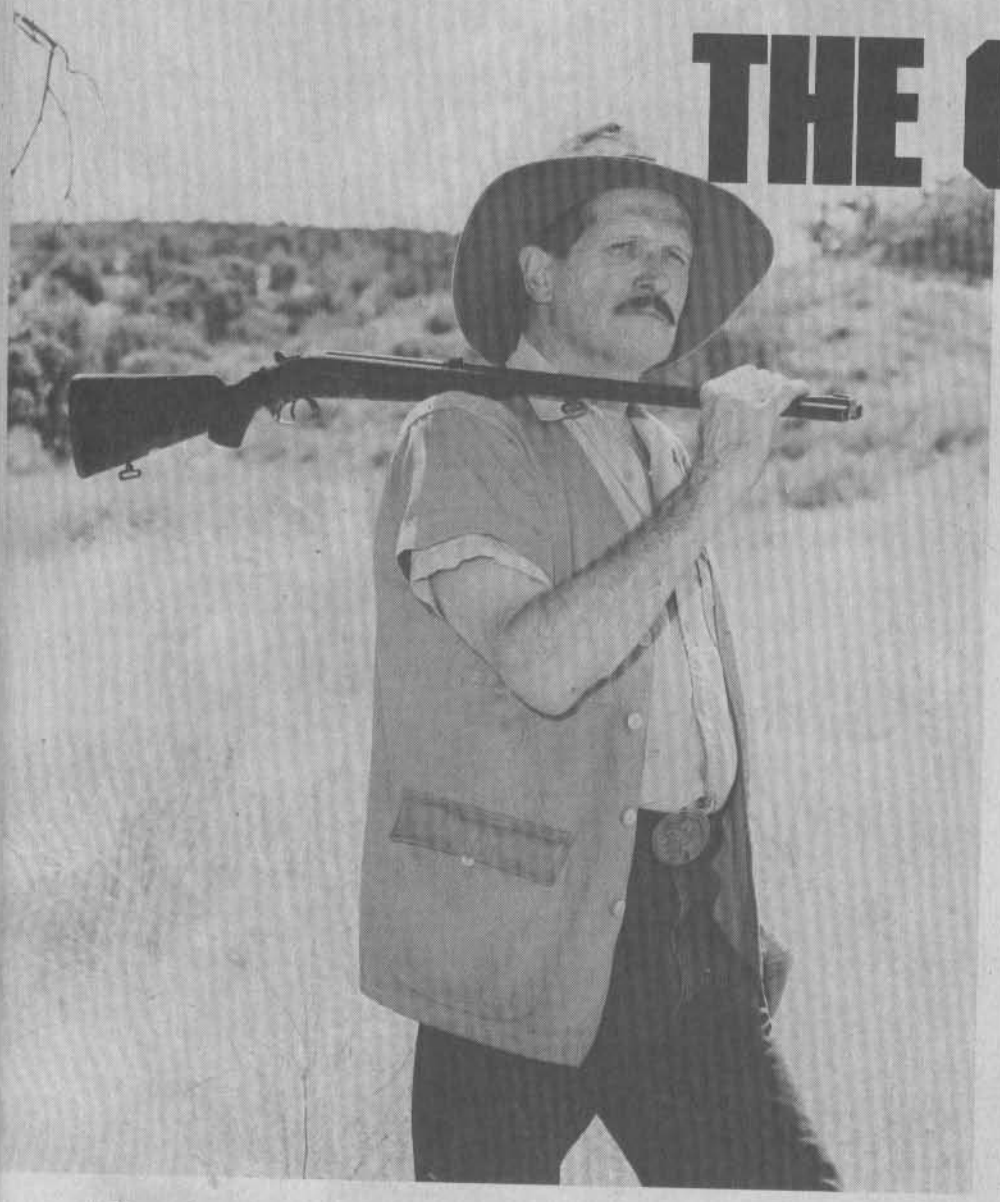
Meanwhile, I await my George Hoenig custom on the Ruger No. 1 with an anticipation bordering on incipient frenzy. It is a .458 with a special chamber of my own design which also fires the .458 Winchester Magnum with equal facility. Knowing George's capabilities, I won't be disappointed, but I can't predict my joy upon receiving it and examining it closely, then shooting it for the first time. There should be enough there for another story.

One doesn't have to make a choice between a single shot or bolt action, or other repeating action rifle—both can reside side by side in the same gun rack with perfect harmony. Take both types on the big hunt and add a measure of thrill and skill by evening the odds a bit on the quarry's end of the scale. You could have a matched pair of .458s or .375s for a quick exchange with the gunbearer, or perhaps a whole battery of falling blocks so you become expert with the same action on each rifle for a variety of calibers. Learn to hold extra rounds in the hand between the fingers for rapid reloading, or hold them in the teeth as I do. I made up a neoprene four-round holder which I clamp with the teeth and which fits my dentition. I simply snap the rounds out and pop them into the breech of my Ruger No. 1. Another more traditional method is to wear a bush jacket or vest with fitted cartridge pouches which hold a group of several at pectoral level for easy removal and reloading.

Some folks deprecate the idea of a single-shot big game rifle in this age of automatics and other rapid-firing persuasions, and maybe they're right about single shots being a reversion to old times. However, maybe it's about time we took a long look at some of the virtues of certain old-fashioned ways of our ancestors—among them the single-shot rifle, if for no other reason than to demonstrate that if we do our part, all it takes is a single shot.

CHAPTER 8

THE CLASSIC DOUBLE RIFLE



They're scarce, expensive, a bit finicky and usually less accurate than bolt guns—but they remain unsurpassed for fast handling and two quick shots!

The double rifle shares the same relationship to the tropical professional hunter as the Colt sixgun does to the cowboy, thanks to books and such films as *King Solomon's Mines* and *Harry Black and the Tiger.* Stewart Granger starred in both films, in the first as an African hunter-guide, and in the second as an Indian tea planter-sportsman with an obsession about bagging a man-eating tiger. Granger wielded various double rifles rather expertly in both films, and such romantic exploitation did for double rifle demand, in a way, what *Dirty Harry* did for the Model 29 S&W .44 Magnum. Is this fact or fiction—are double rifles necessary for tropical dangerous game hunting, and are they up to the legendry? If life imitates art, as the saying goes, the reverse is true of Stewart Granger, big game hunter and double rifleman extraordinary. While on location in Kenya to make *Solomon's Mines,* Granger had with him his Westley Richards best quality .577 double, which had been made for the great Russian sportsman Count Joseph Potocki. When not acting the part of Alan Quatermain, the hunter, Granger was off on the elephant trail with his .577 double, acting the part of Stewart Granger, the hunter. In *Harry Black,* Granger was again "typecast" and once more was the hunter—this time of tigers—on and off camera. However, the line between the legendary double rifle and its true-life role as one of the two viable dangerous game rifle type options remains blurred. Perhaps I can clarify.

The modern double-barreled rifle, like its cartridges, evolved from black powder forms. The first big bore smokeless powder nitro-express was Rigby's .450 "Large Game" 3¼-inch cordite nitro-express, introduced in 1897 with a 480-grain cupronickel jacketed bullet at 2,050 fps. It created a sensation, and soon the velocity was upped to 2,150 fps for a muzzle energy of 4,950 ft. lbs. This compared favorably with an 8-bore double using a spherical bullet of 862 grains and 10 drams of black powder, but no smoke and a 10½-pound rifle instead of the 8-bore's 17 or 18 pounds. Among the first professionals to use the new .450 Rigby was Arthur Neumann, said to be the first man to slay 1,000 elephant. Neumann used a .577 Gibbs double black powder express and a 10-bore Holland double before switching to the .450 which, after the weight and smoke of his black powder doubles, was a godsend. By 1910 Rigby's .450 was the standard by which all "elephant" calibers were judged. Ironically, this new king of the cordite big bores was a smokeless version of a black powder "smallbore," the .450 3¼-inch express with 270, 310, 325 and 365-grain lead bullets ranging from 1,700 to 1,975 fps. Case dimensions remained the same, but cordite, cupro-nickel jackets and nickel steel barrels made the difference.

The cordite revolution began with the military when the black powder .303 service round was converted to cordite and sporting cartridges in Britain followed suit. Cordite is a much maligned and misunderstood double-base powder, being highly erosive (not corrosive) due to its high burning temperature during peak pressure, when its heat equals that of an acetylene torch. Cordite is sensitive to temperature changes but is long-lasting and unexcelled for efficiency and progressive burning at moderate pressures. Its ingredients are nitroglycerine, nitrocellulose and petroleum jelly (Vaseline, to use a popular term), extruded into spaghetti-like sticks.

Holland & Holland followed Rigby's lead, introducing its .500/.450 (.500 refers to the .500 3¼-inch parent case) for its sidelocks. It used the same cupro-nickel bullets, but needed five more grains of cordite (75 grains) to obtain 25 fps more

than Rigby's .450, or 2,175 fps. W.J. Jeffery followed in 1903 with the .450 No. 2, using a great 3½-inch case with a special thick rim and solid head to overcome the weakness of the original black powder cases, which were too weak to handle the increased pressures and caused sticking in extraction. The .450 No. 2, .475 No. 2, .600 and the Jeffery .450/.400 three-inch were the only flanged (rimmed) cordite big bores with cases designed especially for the stick powder.

Most of the demand for doubles was in India where big game hunting was mostly in jungle. Not only the Indian princes of vast wealth, but large numbers of British Indian Army officers, civil servants and planters bought the double expresses of Holland, Rigby, Lancaster and others. In 1907 the British Indian Government banned the use and possession of .450 caliber rifles. The reason was that large numbers of .577/.450 Martini-Henry old issue rifles were in the hands of Pathan tribal raiders of the Northwest Frontier Province near the Khyber Pass. The fact that it isn't possible to load a .577/.450 cartridge into a .450 3¼-inch Rigby or vice versa, nor a .450 No. 2 in a Martini, left the authorities unmoved. The Anglo-Egyptian Sudan administration followed suit and British gunmakers had to introduce similarly powered cartridges of slightly bigger bore to avoid losses. The ban had a beneficial effect on the gunmakers in that their Indian customers had to buy new doubles to replace their beloved .450s, ditto the Sudan, and the many .450s returned to Britain as valuable second-hand merchandise which, due to the .450's prestige, were quickly sold elsewhere. The popularity of .450 cordite doubles and singles didn't diminish at all, but actually increased, as did the ammo use, in East Africa, Northern and Southern Rhodesia and non-British colonies such as the Belgian Congo, the Cameroons, French Equatorial Africa, German East Africa, the Dutch East Indies and French Indochina as well as in America. Right up to Kynoch's ending of cordite express production in the late 1960s, .450 doubles were available new or second-hand, with .450 3¼-inch nitro-express ammo among the most popular big bores. Much of this is attributable to the 480-grain .450 bullet's superior sectional density and penetration, as well as the caliber having become the standard of power and size for a basic heavy game caliber. Another advantage of the .450 3¼-inch is that its rim and base are smaller in diameter than on the .470, .465 and other rounds using the .500 3¼-inch case. This makes a lighter rifle possible and one with a smaller breech action due to the .450 case's smaller head and rim diameter.

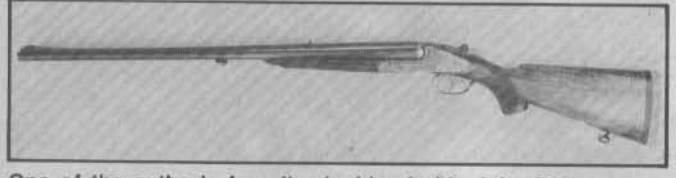
Trouble with Anson & Deeley (boxlock) actions cracking under the increased strains of cordite kept most early cordite doubles in the more costly sidelock design until around 1910 when stronger design and superior steel brought the boxlocks to a strength capable of withstanding cordite. For equal strength, a typical cordite boxlock is, however, bulkier in the action than a sidelock. This follows from the fact that boxlocks have the action body hollowed out for the working parts, but with sidelocks they are mounted on sideplates, leaving the action body more or less solid.

Westley Richards introduced their detachable lock best quality boxlock around 1900, and it was a far cry from their original Anson & Deeley introduced in the late 1870s. By releasing a floorplate catch, the separate locks would drop into the hand and could be instantly replaced by a spare

Elmer Keith has always been a believer in the big bore double for dangerous game. He took this fine tusker with his Boswell .500 Nitro Express double in 1969. It was his second elephant.

This .465 Holland & Holland has gold inlays and enameled sidelocks—one of the most ornate rifles ever made by that firm. Made for a maharajah, it is now owned by Robert E. Petersen.

A best-grade double rifle like this Holland & Holland "Royal" Grade represents the apogee of the gunmaker's art, with its carefully regulated barrels, ultra-precise fitting of the lockwork and other contact surfaces and its exquisite engraving.



One of the author's favorite doubles is his John Rigby which is chambered for the .450 3¼-inch cartridge. This was the first big bore nitro-express round and still among the best.

set. This action had no pin or screw holes, and even the cross pin for hinging the barrels was machined from the solid action forging. This made a hunter independent of gunsmiths when thousands of miles from home, barring stock breakage.

With two separate firing mechanisms, triggers, extractors and ejectors, a big bore double from Britain's best gunmakers became synonymous with "life-saver" or "insurance gun." Some, however, preferred single triggers as did Captain Jimmy Sutherland, the great ivory hunter. Others wanted no ejectors—extractors only—for silence of operation in thick cover and easier cocking. Others, especially in India, preferred the old-style outside hammer rifles with underlevers. These come normally without ejectors, and are the only types that can be cocked or uncocked, one lock or both, loaded or unloaded, in complete silence and loaded without cocking, excellent for close stalking of wounded dangerous game in thick cover by not pinpointing the hunter's position with "clicks" or "pings." This is the system I prefer for stalking Cape buffalo in thick bush.

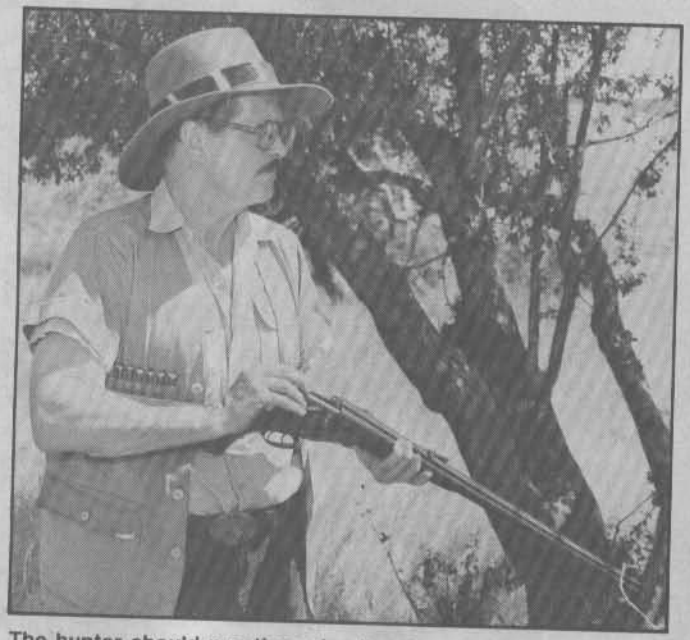
Prominent among best quality doubles were the sidelocks of Holland & Holland, Lancaster and Rigby, with Westley Richards the exclusive producer of best quality doubles in boxlock persuasion. Webley & Scott became the leading boxlock maker, producing actions and rifles for other firms such as the Army & Navy Cooperative Stores, Ltd., a military officers outfitter with a fine reputation for quality. Most British boxlocks for double rifles were furnished by Webley "in the white."

Which is best, sidelock or boxlock? Sidelocks are the traditional "best quality" doubles and for equal weight are stronger than boxlocks, therefore they can be made from ½ to one pound lighter than an equally strong boxlock. There is actually little to choose, functionally, between a best boxlock and a sidelock. Some excellent Belgian doubles have earned fine reputations, such as those of Auguste Francotte, Mahillon and Dumoulin-Delaye. Some of the best German and Austrian doubles have proved excellent, but the undeniably strong German "Blitz" action (trigger plate action) leaves the stock weak due to hollowing-out for the lock parts. It and over-and-under actions of any sort are not nearly so suitable for heavy calibers as side-by-sides. Superimposed doubles work well for such medium calibers as 7x65R, 9.3x74R and even the .375 H&H Belted Rimless Magnum, but they must open wider than side-by-sides, and the arrangement of lock parts cannot be as symmetrical or balanced as on side-by-sides. On superimposed doubles, the upper firing pin must angle upwards, making a less direct primer indentation, and the hammers, cocking levers, etc. cannot be balanced as right and left mirror copies, but in the medium calibers the superimposed double has been evolved to a high and appealing level of excellence.

This John Wilkes .470 boxlock is the last rifle that was made for the great ivory hunter and gun authority John "Pondoro" Taylor. Although lacking some of the advantages of the sidelock, boxlocks like this were sturdy and gave excellent service.

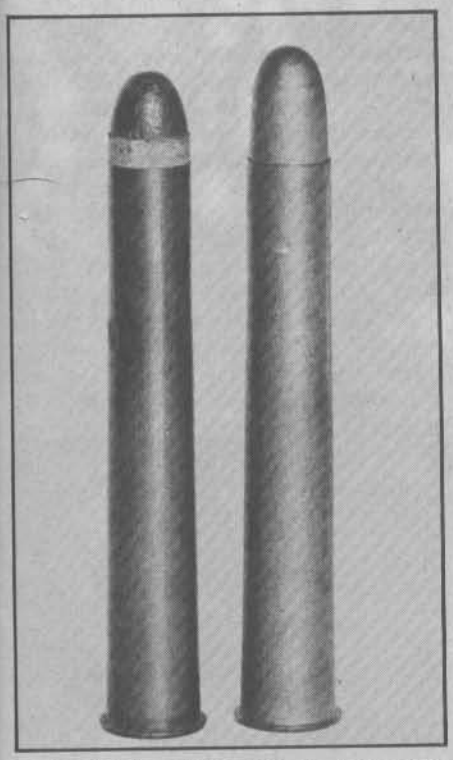
Typical big bore double rifle sights (express sights) are a 50-yard fixed vertical wide "V" with a platinum or gold centerline plus another, or two or three spring-loaded snap leaves for longer ranges. Some say extra leaves are unnecessary, but a 100 or 200-yard leaf is most useful when, say, a wounded buffalo runs off but remains in sight in open or semi-open country. My good friend Dr. Earl Thee, Sr., using my old Lancaster .470, dropped a Cape buffalo at 200 yards with a lung shot after flipping up the 200-yard sight.

Most shots on dangerous game are or should be made well under 50 yards, but



The hunter should practice reloading the chambers of his rifle simultaneously without looking down while keeping his eyes on the game animal at all times, especially with dangerous game.

For much African shooting with either doubles or magazine rifles the author favors a braced offhand position in which he wedges his upper arm and legs against a tree for stability.



Rigby developed the first big bore nitro round, the .450 3¼-inch Nitro Express (right), from its much weaker black powder counterpart shown of the left.

On smokeless powder doubles like this Holland & Holland Number 2 Grade, the barrel lugs are made from integral forgings with the barrels and brazed together. They contain the slots for the sliding underbolts and the hook for the hinge pin.

available sighting for 100 yards or more is wise for the exceptions.

A double rifle's barrels must shoot to the same point of impact to 100 yards (more if for non-dangerous game) and group four consecutive right and left shots in four inches, according to the British standard for heavy doubles. The best of doubles will halve this group size.

This is the difficult part of making a double rifle– *regulation* of the barrels by a master regulator. The process starts with both barrels joined at the breech end and with the bores aligned with a predetermined degree of convergence. If the barrels were mounted with bores parallel, they would shoot widely apart, since the right barrel recoils back, up and to the right, and the left back, up and to the left. To bring both barrels together, a wedge is fitted between the barrels at the muzzles, and if the barrels crossfire, the wedge is moved in deeper to spread the bores apart until convergence of impact is reached. If the barrels shoot apart, the wedge is withdrawn until a common point of impact is reached. The regulator does this by means of heated steel rods, which are kept hot in a brazier and are inserted in the bores to melt the Cornish tin bonding the tubes together. Meanwhile, the barrels are wrapped with iron wire with wedges slipped between the wire and the ribs at various points to hold them down while the rods are inserted. Regulating is done at the range, usually with a standing shooting rest. When the barrels are regulated, the rifle returns to the shop for cleaning off the excess tin and the wedge is then dressed flush with the muzzles, the barrels polished and engraved with the maker's name, then blued. Express sights are also filed in at the range by the regulator, and when zeroed are marked with a line that crosses the sight base and the quarter rib. When everything is blued, these are reinstalled in the dovetail by driving in until the lines match up. Front sights have gold, platinum or ivory beads, and spare beads and extra firing pins are often kept in a trapped grip cap. Folding "moon" front oversize beads may be fitted into recesses behind the fixed front sight for use at night or in dim jungle light.

A hammerless action must open freely when the top lever is actuated, meaning that working clearances must exist between the sliding Purdey underbolts and their slots in the "lumps." On firing, this clearance is taken up as the barrels tend to "hinge" open, or "go off the face." To reduce this tendency, a "third fastener" is installed at the top of the standing breech, which extends from and as part of the barrel forgings. Some forms are so perfunctory as to be useless, but others provide a degree of top bolting, especially Greener's top bolt, the German "Kersten" or "double Greener," Rigby's link and sliding pin and others. The most common form is a "doll's head," with or without a secondary top lever "bite." Sometimes "third fasteners" are bulky excrescences like Westley Richards', extending well beyond the extractors, creating an obstacle that interferes with quick reloading.

The Jones underlever "screw grip" action of hammer rifles actually draws the barrels down tight to the action so that no "running start" causes the barrels to "go off the face" when fired. This action went out of style with the advent of hammerless actions, but is still a fine choice for strength and silence of operation. They clamp the barrels to the action as if all were one piece, reducing case stretching and head separations.

In black powder days the "lumps" (barrel lugs) were dovetailed and brazed to the barrels, but with cordite and other smokeless powders and their greater stresses, it became necessary to devise a stronger method. Thus was born the "chopper

On contemporary safaris double rifles are primarily used as emergency stoppers by the professional hunter. Here noted gun authority John Wootters carries a bolt action rifle while his professional hunter carries a heavy double by the muzzles.

lump" system of forging the barrel lugs or lumps integral with each barrel forging. When finished, each barrel's half of these "lumps" combine to make two "lumps," brazed together and containing the two slots for the sliding underbolts and the hook or radius for hinging the barrels on the hinge pin.

It is the professional hunter's custom to break open the action after firing the first shot, for reloading the fired chamber. If the double has an automatic safety which recycles when the double is opened and the fired case ejected or withdrawn, when the action is closed the rifle is on "safe." This has caused tragedies when hunters reloaded one chamber, closed the action and tried—vainly—to fire, forgetting about the automatic safety. If your double rifle has an automatic safety, remove it or take it to a gunsmith for disconnection—a simple, inexpensive job.

Why a double rifle? More magazine rifles are used for large, dangerous game than doubles, but among rifles of calibers for heavy game, from .400 on up, the proportion of doubles to magazine rifles is surprisingly high. Among my personal acquaintances and to my firsthand knowledge, I have a confirmed list of 52 double rifle users of the post-WWII era to date, and 65 who only use bolt actions. These are all men with heavy elephant caliber doubles or magazine rifles of .375 Magnum caliber and up. This indicates that many of those who can afford safaris, which include costly elephant ivory fees and licenses, will also pay the premium prices of good doubles. If we deal with those who use doubles in calibers from .375 and down, the equation tips greatly in favor of magazine rifles. Winchester's popular .458 deserves most of the credit for the improved proportion of heavy magazine rifle users in a caliber area once almost exclusively confined to doubles.

There are thousands of excellent secondhand heavy bore doubles around, for those willing to pay the prices, in such popular big bore calibers as .450/.400, .450 3¼-inch, .465, .470, the two .500s, etc. Remember that doubles have also been made in .458 Winchester Magnum for over two decades, so these are also part of the market. One reason there are still many good doubles on the used gun market is that few doubles get much firing use and mostly repose sensuously in their fitted trunk cases. Demand for doubles continues with frenzy as dealers, sportsmen and collectors compete for the available stock, and a good double won't get shopworn or sit for months or weeks waiting for a buyer. One reason is that such guns are also excellent investments.

By 1968, all Kynoch cartridges over .375 Magnum were discontinued, although large stocks remained in Britain, Africa and the U.S. Many large lots were bought by speculators and are still being hoarded, and it's amazing how big lots can turn up in the most unlikely spots. With the introduction of Winchester's .458 in 1956, Holland & Holland and other British and Continental makers of doubles soon began offering their wares in .458, but Holland was for some time reluctant to chamber their Royal sidelocks for any rimless belted round. They had sound technical reasons for prefering their own rimmed calibers, the .375 H&H Flanged Magnum and the .465, but after 1968 these were out of production and Holland began advertising the Royal in .375 H&H Belted Magnum and .458. The reason for not wanting to build doubles for belted rimless and rimless cases was that double rifles do not handle pressures as well as Mauser-type bolt actions—not that they don't contain pressures, but that they tend to spring slightly on firing, especially after usage loosens the action, but I'm not speaking of a true *loose* double. Doubles (hammerless ones) cannot have the barrels absolutely tightly down on the action bar and breech face and the sliding underbolts a tight fit in their slots in the lumps or you'd be unable to open the gun. Therefore, a certain amount of working clearance exists, which on firing is all taken

Although one normally associates finely crafted custom bolt action sporters in calibers like his beloved .270 with the late Jack O'Connor, this outstanding hunter and gun expert fully appreciated the distinctive qualities of the double rifle.

The well known and long established custom gunsmithing firm of Paul Jaeger, 211 Leedom Street, Jenkintown, PA 19046, is presently offering custom built double rifles on the Ruger Red Label action. One is shown with rifle and shotgun barrels.

A very reasonably priced double is the Valmet Model 412. It has a barrel adjustment feature that allows the shooter to regulate the barrels for different loads himself. In 9.3x74R being tested here, it's suitable for any kind of soft-skinned game.

up, causing some degree of opening for an instant. This temporarily increases headspace, which may already be on the high side, but within tolerances, before firing. Then, of course, there is a working tolerance for headspace built into the cartridge case so the round fits all within-tolerance chambers. When such chamber and cartridge headspace tolerances combine with the normal "give" of the breech hinging action, there is a significant gap in the chamber's "belt" recess in front of the "belt" of the case. With doubles that are within tolerances but which are well broken in, this unsupported circumference around the case wall at the juncture of it and the "belt" can cause a ring of the case wall to be formed around this circumference. In drastic cases it causes head separations. With a rimmed case, any such gaps are well within the solid head and pose no danger with fresh ammo. This original weakness of belted cases was remedied when Winchester-Western and Remington beefed up the solid heads of their belted brass so the solid head overlaps the intersection of the case wall and the belt's leading edge. Now this is almost an unheard of problem with modern belted cases.

A renaissance of the .470 and other popular British nitro-expresses is now in full sway, thanks to Jim Bell of the Brass Extrusion Laboratories, Ltd., or B.E.L.L., who makes .470 and other ex-British brass (Boxer priming pockets) via the impact extrusion process. Holland & Holland contracted with B.E.L.L. to produce loaded .470 ammo, and I have tested this fine ammo. It is remarkably accurate in the doubles I shot. The steel-jacketed solids produced by B.E.L.L. are the heaviest jacketed ever, with an incredible ¼-inch steel nose jacket! B.E.L.L. also produces the basic brass for all nitro-expresses on the .500 3¼-inch case as well as for the .450 3¼-inch, the .450/.400 3¼-inch, the .375 H&H Flanged Magnum, the .577

Double rifles can be extremely accurate at reasonable ranges. These tight 50-yard right and left groups were printed by three different double rifles.

BALLISTICS FOR RIMMED DOUBLE RIFLE CARTRIDGES

Cartridge	Bullet (grains)	Bullet Diameter (inches)	Powder (grains)	Muzzle Velocity (fps)	Muzzle Energy (ft. lbs.)	Notes
9.3x74R	285 R.N.	.366	NA	2360	3522	R.W.S. ammo
	293 TUG	.366	NA	2360	3580	
.375 H&H Fl. Mag.	300 R.N.	.375	56 Cord.	2425	3930	Standard .375 bullets
	270 Semi-Ptd.	.375	59 Cord.	2600	4060	
	235 Semi-Ptd.	.375	60 Cord.	2750	3950	
.450/.400/3" N.E.	400 R.N.	.411	60 Cord.	2125	4010	Bullets available
.450/.400/3¼" Mag. N.E.	400 R.N.	.411	60 Cord.	2150	4110	
.450/3¼" N.E.	480 R.N.	.458	70 Cord.	2150	4930	
.500/.450/3¼" Mag. N.E.	480 R.N.	.458	75 Cord.	2175	5050	
.450 No. 2 N.E.	480	.458	80 Cord	2175	5050	
.500/.465 N.E.	480	.468	73 Cord.	2150	4930	.470, .500/.450, .500/3¼" brass usable.
.470 N.E.	500	.475	75 Cord.	2125	5030	.500/.465, .500/.450, .500/3¼" brass usable.
.475 N.E.	480	.483	75 Cord.	2175	5050	.450/3¼", .450/.400/3¼" brass usable.
.475 No. 2 N.E.	480	.483	85 Cord.	2200	5170	
.475 No. 2 Jeffery	500	.489	85 Cord.	2120	5000	Standard .475 No. 2 brass usable.
.476 WR	520	.476	75 Cord.	2100	5090	.470, .500/.465, .500/.450, .500/3" and 3¼" brass usable.
.500/3" N.E.	570	.510	80 Cord.	2150	5850	.500/3¼", .470, .500/.465, .500/.450 brass usable.
.500/3¼" N.E.	570	.510	80 Cord.	2125	5720	.470, .500/.465, .500/.450 brass usable
.577/2¾" N.E.	650	.584	90 Cord.	1950	5500	.577/3" brass usable.
	750	.584	90 Cord.	1800	5400	
.577/3" N.E.	650	.584	90 Cord.	1950	5500	In rifles proved for this load only.
	750	.584	100 Cord.	2050	7010	
.600 N.E.	900	.620	100 Cord.	1850	6840	
.600 N.E.	900	.620	110 Cord.	1950	7600	

Sources: Kynoch (I.C.I.) 1954 Rules of Proof, bullets miked in most cases.
Fl.—flanged. R.N.—round nose. Cord.—Cordite.
WR—Westley Richards.

three-inch and others, including .404, .425 and .416 Rigby cases and soon, .416 loaded ammo with Hornady steel jacket solids. Huntington Die Specialties can furnish any B.E.L.L. products and Barnes, Hornady and other bullets as well as all loading equipment. These (and other firms' for big bore users) addresses and other information are listed in our Directory at the rear of this book.

How about double rifles for "all around" calibers such as the .375 and the fine 9.3x74R? Incidentally, the 9.3x74R, with its 285 and 293-grain .366-inch bullets, is on a power par, with equal barrel lengths, with the original .375 H&H *Flanged* Magnum. Doubles are especially suited for woods hunting in North America with suitable calibers, and make the most dependable rifles for freezing Arctic weather. A scoped .375 or 9.3x74R can be used for any game (including dangerous game in open country) with correct bullets. This utility includes deer, all bears, moose, wild pig, leopard, lion, kudu, sable, elk and similar large herbivores up to the huge eland. With good detachable mounts and a low-powered scope, a well-regulated double is superb for hunting out to 300 meters and more in some cases. I proved this to myself after taking most big game (non-dangerous) species in southern Africa in three months in 1974. I used my .318 H&H Modele de Luxe Royal double with its 3X Voigtlander scope on detachable H&H mounts. It is a .33 caliber round with 250-grain bullets at 2,400 fps, and I found it superb for a quick second shot with no other movement than switching to the second trigger. This often got me a second shot without moving from the spot. The double's "glass rod" triggers are also a bonus, and I took game up to 250 yards from a tree standing rest. I also hunted Java and Sumatra with my Merkel 9.3x74R superimposed double, which I scoped using my own custom mounts.

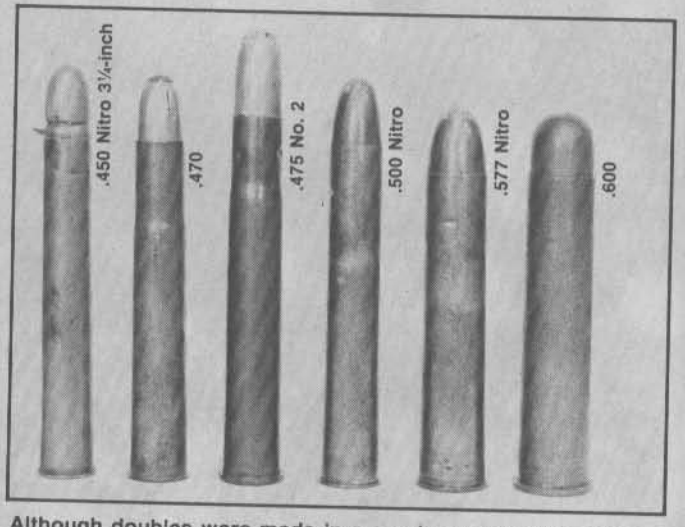
The *1983 Guns & Ammo Annual* catalog section and that of the *Gun Digest* show an unprecedented 10 double rifle models as stock items offered by their importers. These do not include the British and Continental custom makers. Valmet's Finnish Model 412K superimposed double rifle, available in a variety of calibers up to 9.3x74R; Winchester's .30-06 on a Model 101 O&U action; Browning's Continental; Heym's Model 88B side-by-side and their superimposed Model 55B in .375 H&H, 9.3x74R; and .458 Armsport's side-by-side "Emperor" Model 4010 and their superimposed Model 4000 in a wide range of calibers from .243 to 9.3x74R and .375 H&H all vie for the growing U.S. double rifle market. Believe it or not, there are at least two double rifles made in America: by Paul Jaeger, on the Ruger 20 gauge "Red Label" action in .375 Magnum, and by the Sacramento, California gunsmith Hubert Hecht, of Waffen Hecht, on the Winchester 101 action. This all goes to show that the double rifle, if anything, is taking an increasing share of the medium to big bore market.

What are the advantages of double rifles? Two chambered rounds ready for firing at the command of the trigger finger. Two independent locks and barrels and (except for single triggers) two separate triggers. The double rifle man has only to aim and press triggers with no bolt or lever

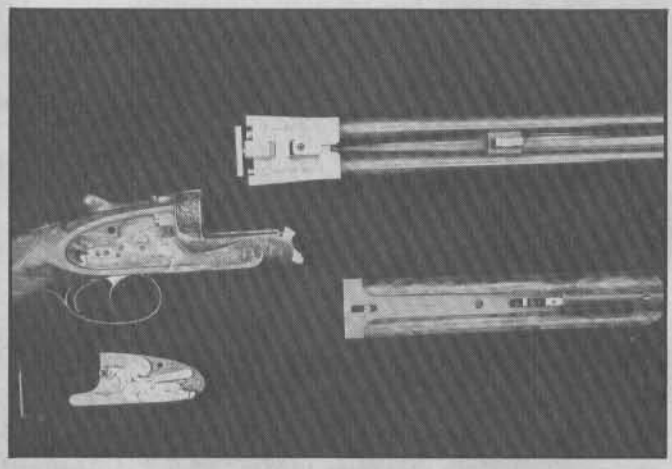
The double rifle's true forte is as a heavy caliber stopping rifle for dangerous game. These two massive lions were taken in Kenya with a Jeffery double chambered for the .475 No. 2.

In sustained fire tests conducted by the staff which involved quick aimed shots and rapid reloading against time, the double rifle held its own very well against other rifle action types.

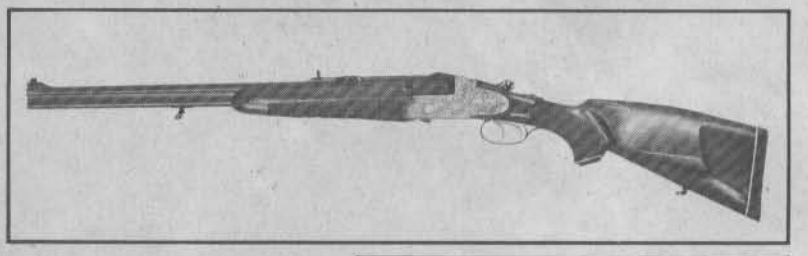
Against dangerous game in close cover, the author prefers a heavy caliber double rifle to anything else. He took this Cape buffalo in Rhodesia with his Holland side-hammer .577 Nitro.



Although doubles were made in a great many smaller calibers, we tend to think of the big bore British Nitro Express rounds like those shown above as the classic double rifle calibers.



Sidelock double rifles like the author's Holland Royal Grade .318 allow easy removal of the lockworks for access to locks, receiver and the inletting.



(Top) Extremely precise fitting characterizes the lockwork of these Holland & Holland sidelocks, a Royal Grade in .458 Mag. (L) and a No. 2 Grade in .465 (R). (Right and above) Over/under doubles like this one from Karl Hauptmann of Ferlach, Austria, break on a wider arc than the side-by-sides, but, scoped, they make practical rifles in the hunting field (left).

operation, and once loaded, has no risk of a jam. This makes for operational silence between shots and frees the hunter from all else but concentrating on aiming and the game. The conventional argument for doubles is that both locks won't fail at the same time. Though generally true, this *can* happen as with my Holland .465 Royal when a stirrup broke in one lock and a piece lodged under a cocking lever, preventing the gun from opening. I had my second shot (fortunately at the range) but until I removed the offending part at home, my rifle was nothing more than a good looking but expensive club.

A double also handles cartridges too long and large in caliber for feeding in a magazine rifle, for more frontal area and heavier bullets. If two shots are all that is needed (during a charge there is rarely time for more), a double delivers them with less complication and more surety than a magazine rifle. But the argument of double users claiming equal or greater firepower over magazine rifles by holding extra rounds between the fingers is tenuous. The only proven and professional way to obtain anything like equal firepower is via a brave and proven loader with a second double, as was the custom of the late John "Pondoro" Taylor and the late Bob Foster of Kenya. The late, great John A. Hunter, the Kenya professional and author of *Hunter,* stated the situation in that book:

"When it comes to dealing with elephants, I consider that Saseeta stands alone among all Kenya gunbearers. He is also remarkably quick at exchanging rifles and loading. He is not only an excellent tracker, but steady to a degree. When one is shooting elephants with a double-barreled gun which permits only two shots, this is an important consideration. When hunting big game with a double-barrel rifle I always like to reload a barrel after firing, so I am sure of having two shots in case of a charge. This, of course, if I have time. I opened the breech of my rifle to put in another shell. To do this, I had to glance down. Suddenly I heard Saseeta cry out. When I looked up, the elephant already was on me!"

Note that Hunter, a master hunter and double rifle user, had a loader, but it didn't help. Had Hunter been using a heavy, reliable magazine rifle, he would not have had to look down, and could have *kept his eye on the elephant* as he fired his second shot, which, if he had time to reload a chamber in his double, he would have had time for with a magazine rifle. And he would still have had three more rounds left in a magnum magazine. If he ran out of rounds in the magazine, he could have "slipped one up the spout" with an extractor that snaps over the rim.

This doesn't mean I downgrade doubles as the top choice in the heaviest calibers for thick jungle or rain forest, or in cover like in the thick Jess bush of Zimbabwe's Zambesi Valley. In such cover, the heavy double is the shortest overall, fastest to get into action, and fastest for two shots without working an action. It handles and fires the heaviest bulleted cartridges and is the most silent in operation. Easy takedown for cleaning and shipping makes the double great for air travel—even in an ordinary suitcase. For southpaws it is the obvious solution with a suitably cast-on stock. Less skill is demanded in moving from one trigger to the next than in operating a bolt from the shoulder as required for adequate speed on such game. Having used doubles for about 50 percent of all my hunting, I always have good doubles in my battery, which of course includes good magazine rifles. But if you are accurate and reasonably fast in operating a bolt at the shoulder, you can do it all with a good bolt action for a suitable cartridge, and at much less cost.

CHAPTER 9

THE GREAT .375 HOLLAND & HOLLAND

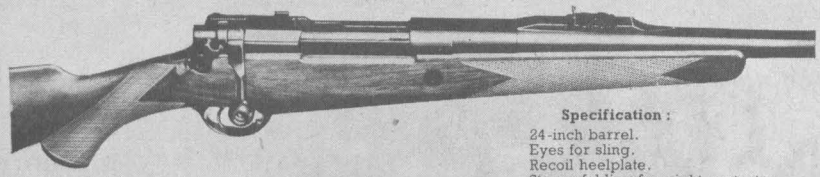
Since 1912 this cartridge has remained one of the top all-around choices!

The .375 H&H Magnum is probably the most versatile cartridge available for any of the larger game on this planet. Ideal for big bears (L) and acceptable for elephant, it can be loaded to a wide range of power levels (above). Above is a squib load with a round ball, next a light cast bullet load, then a soft nosed hunting bullet, and a 300-grain solid for the really big stuff.

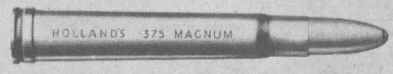
Much praise and little criticism have been written about that "king of the medium magnums," the great .375 Holland & Holland Belted Magnum. Certainly it is one of the liveliest septuagenarians around, having arrived in 1912 as Holland's answer to Rigby's .350 Magnum. Since that dim distant day in 1912, the belted ⅜-inch bruiser has been the archetypical belted magnum round, and the basis for a parade of belted magnums, including the .300 H&H Magnum and the Winchester short magnums. If one wants to conduct research to find out why the "belt" of the typical magnum is popularly regarded as essential to a magnum's anatomy, the answer would doubtless be "because the .375 Magnum has a belt." Actually, the "belt" is essential to both the .375 and .300 H&H Magnums since neither has a shoulder definite enough for headspacing, and the .458 has none. The concept is ingenious in providing a headspacing register which is almost as positive as a rim, but without the rim's obstacle to smooth feeding in a Mauser-type magazine. The .375 H&H belted Magnum's direct ancestor was the .375 H&H flanged (rimmed) Magnum for double rifles, and the "belt" was simply a way to apply a sort of "rim" to a rimless case.

The .375 H&H Magnum wasn't Holland's first belted case, but the second. The first was Holland's .375 Belted Nitro-Express or .400/.375 Belted Holland-Schoenauer, also known as the .375 Holland "Velopex." It was about as powerful as the 9.5x57 and was loaded with 320-

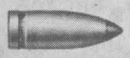
STANDARD MODEL ·375 MAGNUM
ENFIELD ACTION



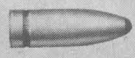
Specification :
24-inch barrel.
Eyes for sling.
Recoil heelplate.
Strong folding foresight protector.
Fixed stock of seasoned French walnut.
Crisp, single, trigger pull.
Weight 8 lb. to 8½ lb.
HOLLAND'S NEW LIGHT ALLOY MAGAZINE BOX holding four cartridges



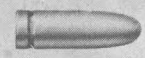
Holland's Belted Cartridge (Full Size) for Magazine Rifles.



235-Grain Copper Pointed Bullet.



270-Grain Soft Nose Pointed Bullet.



300-Grain Solid Nickel Bullet, also Soft Nose.

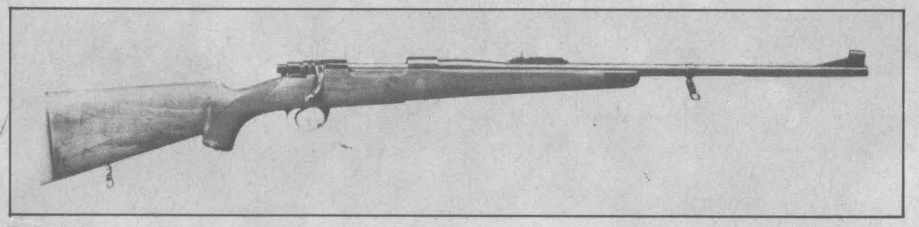
Ballistic data of the ·375 Magnum cartridge

Bullet	Muzzle Velocity ft. per sec.	Muzzle Energy ft.-lb.	100 yards Velocity in ft. per sec.	100 yards Energy in ft.-lb.	Trajectories, in inches: 200 yards Height at 100 yards	Trajectories, in inches: 300 yards Height at 150 yards
235 gr. Copper-pointed	2800	4090	2535	3360	2·6	7·2
270 gr. Semi-pointed soft-nosed	2650	4210	2415	3496	2·8	7·4
300 gr. Solid Soft-nosed, or W.R. Capped	2500	4070	2253	3390	3·2	8·3

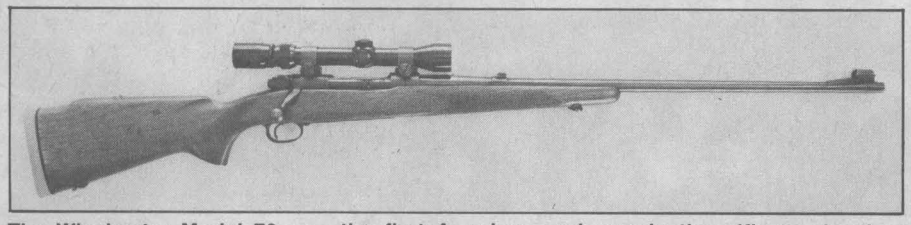
Holland's ·375 Magnum Rifles are normally sighted with an upright standard fixed backsight for 200 yards range and a folding leaf sight for 350 yards. Cut with a medium " V " and with fine silver line beneath this type of sighting is suitable for most sportsmen. The foresight is silver tipped of ·062" diameter and a spare sight is also provided.

We make a speciality of sighting rifles to customers' own requirements if the standard sighting does not conform to their wishes.

After World War II, when the magnum Mauser actions Holland & Holland used in their .375s became unavailable, Holland made many rifles on the Pattern 14 Enfield action, as this illustration from a Holland & Holland brochure of the early 1950s shows.



For those desiring a .375 H&H Magnum with traditional British styling at moderate cost, Interarms' Whitworth Express Rifle is a good bet. Formerly made in England, they are now made in the U.S. using a true Mauser 98 action—the Yugoslav Zastava.



The Winchester Model 70 was the first American-made production rifle to chamber the .375 H&H Magnum. Winchester's move brought .375s within reach of the average hunter; previously the only American .375s had been expensive, custom made rifles.

grain and 270-grain bullets at a bit more than 2,000 fps velocity. This causes confusion and some unpleasant surprises when a mail order "Holland & Holland belted .375" turns out not to be what the purchaser had hoped would be an original H&H .375 Magnum at a bargain price!

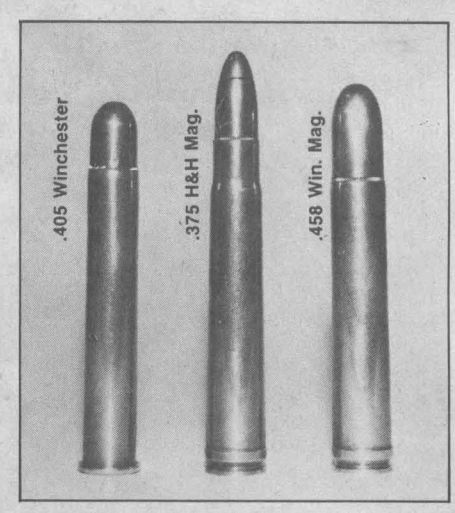
The British loadings were of lower velocity than U.S. loadings, which came on the scene much later. The British Kynoch 300-grain load had a 2,500 fps velocity; the 270-grain, 2,650 fps; and the 235-grain around 2,900 fps—all from a 28-inch test barrel. With standard 25 or 24-inch barrels these British velocities will be a good 100 fps less. U.S. loadings were formerly published for the pre-64 Winchester Model 70's 25-inch .375 barrel—2,550 fps with the 300-grain, 2,740 fps for the 270-grain and some 2,900 plus for the 235-grain, which is long out of production. Today's U.S. loadings are for a 24-inch barrel—2,530 fps for the 300-grain and 2,690 fps for the 270-grain. Incidentally, those wanting 235-grain .375 bullets can obtain Speer's semi-spitzers.

This reduction of velocity isn't enough for any practical disadvantage, but handloaders can easily make it up and then some, using canistered powders, given the .375 H&H's outsized capacity. Handloaders should always use magnum primers for all the big magnums.

The .375 H&H Magnum has been referred to as "neither fish nor fowl," meaning it was too big for most game and not big enough for elephant and such. This unkind apellation is undeserved, because the .375 was designed to provide the big game hunter with an "all around" or general purpose rifle he could use for the largest herbivores of the deer and antelope family, dangerous bears and the great cats. Its use on dangerous thick skinned game such as Cape buffalo, elephant and rhino is marginally adequate and then only in open country. It never was a preferred option for charging game, although for the great cats it is regarded as adequate by some hunters, and it's certainly adequate for the large North American bears. It is best employed with a scoped rifle so its customarily superb accuracy and flat trajectory can be utilized.

Others find it a wonderfully accurate and suitable caliber for lighter game than originally designed for, such as mule and whitetail deer. Indeed, when carrying my .375 Holland-Mauser, I have taken many a duiker, bushbuck, reedbuck and impala. The .375 takes such lighter game neatly with the 300-grain bullet, usually with little meat loss. Since the .375 does it all so well, I have never bothered with a light rifle such as a .30-06.

Whereas it is on the light side for charging and wounded dangerous game, and for thick cover or rain forest hunting of elephant, buffalo and rhino, I cannot think of a single species of game animal that the .375 won't take cleanly in the open with a well-placed shot. According to personal experience and the conclusions of the many guides whose brains I've picked, no lesser



The .375 displaced the old .405 Winchester as the most powerful standard production caliber in America. In 1956 the .375 H&H was dethroned by the .458.

caliber brings down so wide an aggregate of big game species with any well-placed hit in so short an interval. This seems to be due to a happy combination of nearly .40 caliber, combined with fairly heavy bullets at quite high—but not too high—velocity.

Efforts at "improving" the .375's performance by blowing out the case and adding 10 percent more powder for five percent more velocity only seem to follow the path of diminishing returns and a significant loss of velocity for factory ammo fired in the "improved" chamber. Certainly, according to the guides I've queried, the "improved" versions have less penetration

with soft-nosed bullets than the factory spec loads. Factory solids, including Winchester-Western's steel-jacket solids or Remington's and the last Kynoch steel solids, enjoy a remarkable reputation of having the deepest penetration of any standard factory big bores, including the .458, .470 and .465. With such steel-jacketed solids the .375 usually exits on broadside shots on elephant heads and chests, and Cape buffalo and rhino chest shots. One must remember, however, that the .375 lacks the frontal sectional area to be a proper "stopper" on heavy dangerous game in close cover or when charging.

Far from being solely an African cartridge, the .375 is a world-class cartridge, equally at home in Alaska's coastal wetland bush, the Arctic tundra of Canada's Northwest Territory, the steaming bushveld of Africa's Zambesi Valley or Australia's sprawling savannah buffalo country of her tropical north. Not surprising to those who have tested the .375's accuracy with factory or handloaded ammo is the popularity of the cartridge with many hunters who use it for nothing larger than mule deer or elk. Others aren't the least embarrassed to tell you about shooting ground squirrels or jackrabbits, using reduced loads and cast bullets, another dimension to the .375's great versatility. It is doubtful if the good directors of Holland & Holland had such extracurricular activities in mind when they adopted the .375 H&H Magnum back in 1912, but reduced-load cast bullet accuracy is one of the caliber's finest assets, and one not shared with a number of other potent magnums.

From time to time there is mention of claims that the .375 is capable of placing all three original bullet weights in the same group at 100 yards. Certain writers ridicule such claims without adequate research. In *African Rifles & Cartridges,* John Taylor said: "Should anybody feel like raising a skeptical eyebrow in connection with my statement that a double .375 Magnum will group accurately with all three of its different loads, I might mention that a Holland & Holland double .375 (Flanged) Magnum fitted with ordinary open sights was sent to the British *Field* magazine for testing and report. Both barrels were fired consecutively, all three loads being used, three or four shots with each load. The composite group at 100 yards measured 2½ inches deep by two inches wide. The unbeliever can write either to the *Field* or to Holland & Holland who will be pleased to send him a copy of that report with a full-sized reproduction of the target."

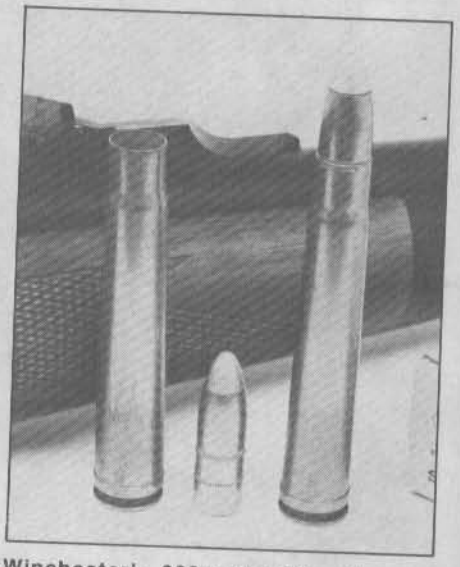
There's no need to bother the *Field* or Holland & Holland—I've seen a copy of the target and I've duplicated the results with the 300-grain and 270-grain loadings of the .375 H&H Flanged Magnum in a fine H&H Royal Ejector double using a scope on my own mount at 100 yards. The 270-grain bullets printed slightly higher than the 300-grain, but the group was amazingly tight using consecutive barrels with three shots per load, per barrel. It is the stiffness of both barrels when joined together by top and bottom ribs and at the breech and muzzles to themselves that damps barrel vibrations, reduces muzzle flip and enables both barrels to group together. I have also found my full-stock Holland-Mauser .375 to group both 300 and 270-grain full loads together at 100 yards using a scope. Doubtless all .375s won't do this, since barrels vary in their vibratory characteristics, and stocks also vary in their damping effect on barrels. Here's where precise forearm inletting and full wood contact help reduce erratic barrel vibration. In my rifle's case, the 270-grain bullets print about two inches higher than do the 300-grain, but both weights print into three-inch or tighter groups from the benchrest.

Those who hunted Mozambique (Portuguese East Africa) in those wonderful years before the 1974 leftist coup know that the favorite rifle of that colony was the .375 Magnum. More often than not it was a Model 70 Winchester. This is Wally Johnson's favorite rifle. His ex-partner Harry Manners used a prewar heavy barrel version. Together both took thousands of elephant, buffalo and lesser game—all with .375s. In those days the "solids" were with gilding metal jackets such as Winchester's bluff-nosed loading, but around 1958 Kynoch introduced steel-jacketed 300-grain solids and I began using them in 1959. It was the Winchester-Western 300-grain Silvertip that was the most popular load for the .375 in Mozambique, even for buffalo by professional hunters. They usually aimed behind the shoulder with these, and the best hunters rarely needed more than one shot. I began using these Silvertips in Mozambique in 1959, then in Rhodesia and Nyasaland in '62 and '63, continuing to rely on them right up to the present.

I can only say that I have never been let down by the Silvertip or the .375, although I was disappointed with the performance of the 300-grain Westley Richards round-nosed copper capped bullets, which proved very frangible.

In my entire experience with the .375, I have used four-round magazines, which is a good capacity, but a five-round magazine is even better. However, a three-round magazine is adequate. Most .375 Magnums use standard-length actions which like the Model 70 or the Mark X have been opened up for the 2.850-inch case, and if done properly such lengthening works fine. My Holland-Mauser and most Holland rifles for the .375 Belted Magnum are on opened up standard actions. Talk of "setback" resulting from such modification is rubbish so long as adequate action hardness exists.

Initially the .375 H&H Belted Magnum used original Mauser magnum length actions, an entirely forged action and not made by welding parts of two actions together as some have claimed. I have owned and examined more than a few original magnum Mauser actions and I never have seen one made by welding. I have seen a few such jobs, but none could be passed off



Winchester's 300-grain Silvertips are a favorite load of the author's. He has never had one fail him in his many safaris in the game fields of Africa.

***Guns & Ammo* Editor Howard E. French took this lion in the Sudan with a .375 H&H Magnum. For big cats like lion and tiger, the .375 is normally considered an ideal caliber. However, author Lott prefers an even larger caliber when following up wounded lion in heavy cover. For bigger game like buffalo and elephant, the .375 is adequate if bullets can be carefully placed.**

as original magnum Mausers. Welding, even if by Heli-Arc, is always very visible, aside from the fact that such a procedure would be unprofitable and barred by German proof laws. Many Holland and other .375 Magnums were made on sporterized Pattern '14 or U.S. 1917 actions. Browning Safari Grade rifles as once made in Belgium's Fabrique Nationale factory, Mark X and Whitworth rifles all use opened-up, standard length Mauser actions. Sako and Remington .375s use magnum length actions, as do Champlin and other semi-custom .375s.

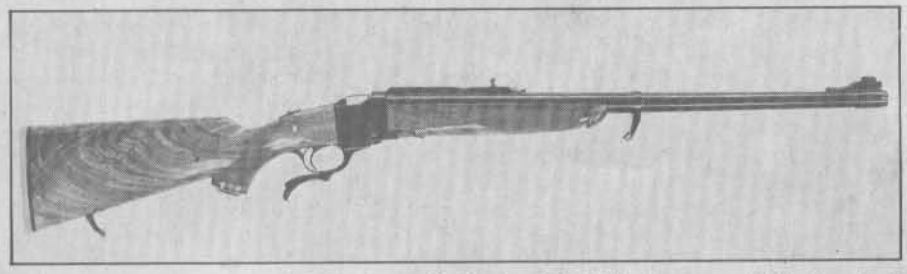
Adding up the number of friends who regularly use .375s, I find that the majority still do. A few used it as the main rifle, but most, like myself, Bob Petersen, Tom Siatos, Ken Elliott, Craig Boddington and Howard French, carry the .375 as a general-purpose rifle. Most carry a heavy rifle with it for the "biggest and the baddest." My reason for using the .375 as my regular rifle is that I have adopted a rule, which I never deviate from—to always carry a rifle which is adequate for any emergency. This means that my "light rifle" must be capable of taking care of lion, leopard, buffalo, bears, rhino or elephant, as well as being the main "meat getter." This translates into ".375 Magnum"! It's not that I'm a reactionary—I just don't know of another caliber that does it all so well, even if a bit more powerful than necessary at the lower end of the game spectrum and a mite short at the upper end. I've been waiting for over 25 years for somebody to prove to me that another cartridge does it better, but I've stopped holding my breath!

As for allegations of insufficiently flat trajectory, I've taken a couple of zebra on an open plain at almost 400 yards, and a magnificent gemsbok bull on a South West Africa "vlei" at a paced 345 yards—all with 300-grain Silvertips and all with one shot each! With the 300-grain Silvertip printing three inches high at 100 yards, using a scope, it zeroes at 200 and is a foot low at 300. The 270-grain W-W Power-Point, when impacting 2¼ inches high at 100, is one inch high at 200 and 8½ inches low at 300. With such a trajectory there is no excuse for any rifleman to blame a miss on trajectory within 250 yards. By far the majority of one's shots at game will be well within 200 yards anyway. For the 10 percent or less shots at over 250 yards, a simple holdover will usually take care of drop.

If desired, the 270-grain semi-spitzer can be used and a few carried in a separate holder for loading "up the spout" for reducing drop for shots over 250 yards, but I've never needed them when using 300-grain Silvertips. For the ultimate flattening of trajectory, load up some 300-grain Sierra boattails to about 2,600 fps.

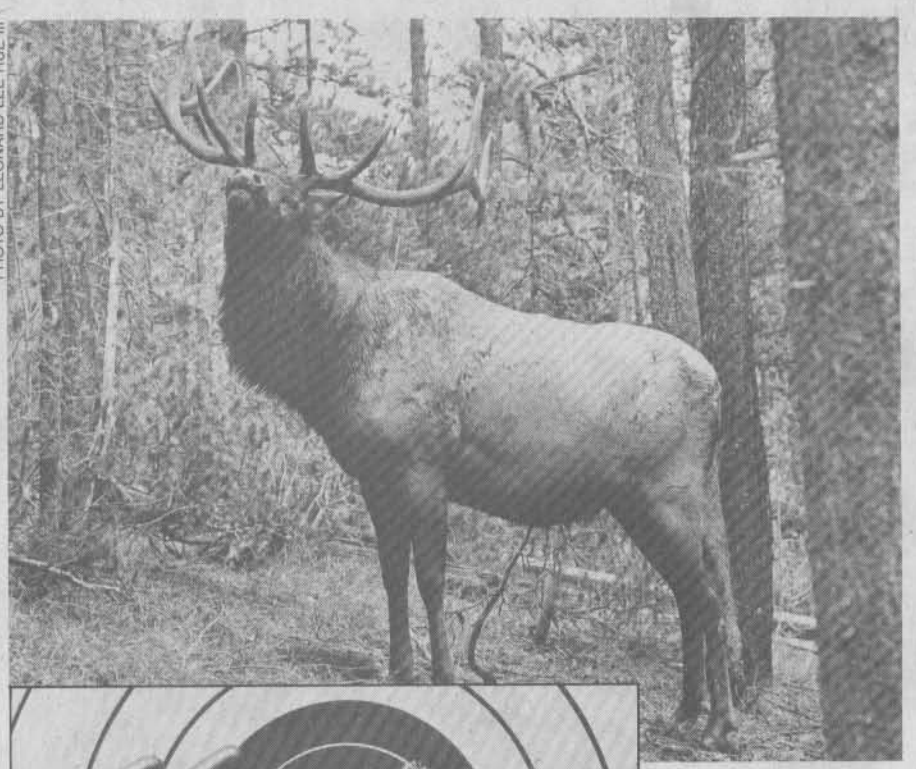
Among the better expanding factory loads are Dynamit Nobel's RWS brand 300-grain "K-S" cone points, and their steel-jacketed solids are also good. The K-S cone points have a reinforced jacket and base which retain plenty of core weight after expansion according to reports from Africa. Like Speer's "Mag-Tip" bullets, these K-S bullets also have the jacket coming flush with the lead tip for non-deformation during recoil in the magazine. RWS solids are very tough, and all RWS .375 300-grain loads group with domestic loads according to my tests.

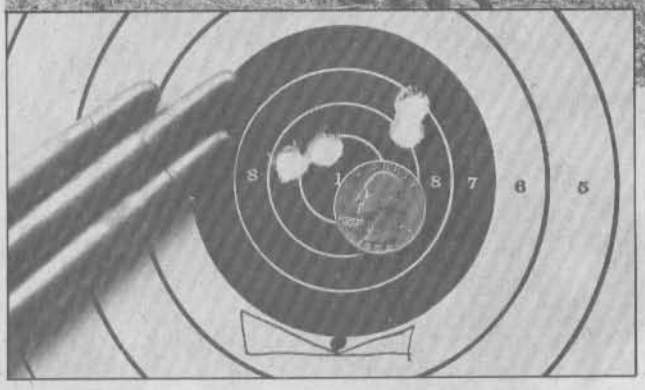
If there were a "World's Championship" for the most useful big game cartridge, it would almost certainly be awarded to the .375 H&H Belted Magnum, with second place to the .30-06. If no such cartridge as the .375 Magnum existed, somebody would have to invent it. And if anyone has evidence of a better world-class, all around choice, here's a guarantee of return postage for my becoming the second to know!



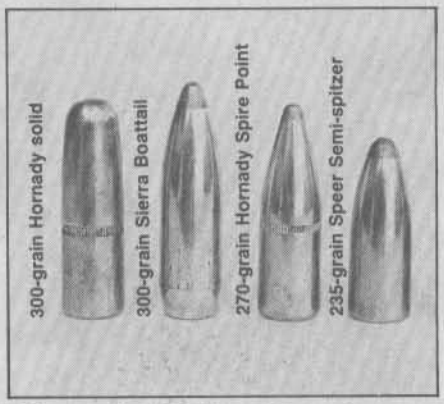
The Ruger No. 1 Tropical Rifle is available in .375 H&H Magnum. With its short overall length and lack of feeding/magazine problems, it's a good choice in .375.

PHOTO BY LEONARD LEE RUE III





The .375 H&H is by no means "overpowered" for elk, and it is a favorite of knowledgeable hunters of elk and other North American big game. With groups like the one at left, the .375 has plenty of accuracy for long range work in mountain hunting.



Although the .375 doesn't have the range of bullet weights available that some other calibers do, one can handload the 235-grainers for long range shooting at smaller animals, 270 or 300-grain soft points for larger soft-skinned game and use 300-grain solids on thick skinned game like buffalo and elephant.

CHAPTER 10

THE .458 WINCHESTER MAGNUM

Designed to drop the world's biggest game and to chamber in short-actioned rifles, this American big bore has become the world's standard "charge stopper"!

The .458 Winchester Magnum is one of the greatest postwar commercial cartridge successes, sharing the limelight and the market with those other belted short magnums, the .300 Winchester Magnum, the 7 mm Remington Magnum and the .338 Winchester Magnum. The original concept was a .30-06 (2½-inch) length elephant-class cartridge, on a power par with the then most popular rimmed British nitro-express, the .470. This commercial success is not the only thing shared by these disparately powered magnums, since all of them have a common rim and "belt" diameter.

Introduced by Winchester in 1956 in a special edition of the tremendously popular Model 70, the new .458 rifle was called the "African." It was a "Super-Grade" version with special adjustable open "V" express sights, a 25-inch barrel, a short forearm and sling studs ahead of the fore-end tip on the barrel, English style. The words "Super-Grade" are impressed in the floorplate and like all "Super-Grades," the "African" had superior wood, a cheek piece, wraparound checkering, a steel grip cap and a black fore-end tip. The first version had only a single recoil bolt through the stock behind the receiver recoil lug and no second recoil lug brazed to the barrel. A few years and many split stocks later, Winchester added a second recoil lug to the barrel via a milled flat to which this heavy lug was oven brazed. A second recoil bolt was installed through the stock web between the magazine and the trigger, and the usual splitting ceased. This final version of the pre-64 "African" remains the most sought after .458, but any pre-64 Model 70 .458 "African" brings a high price if in good or mint condition.

I took an early version with one recoil lug and stock bolt to Mozambique in 1959. The stock, a fancy "fiddleback" dense American walnut beauty, was split, from merely sighting-in at the range, behind the receiver recoil lug, through the web between the magazine and trigger, and starting a hairline split behind the receiver tang. I wrote Winchester and they offered to replace the stock, but since the grain was so pretty I decided to repair and reinforce the stock. I added a through recoil bolt made from a 5/16-inch Allen screw, trapping it in epoxy behind the magazine. I replaced the original recoil bolt with another 5/16-inch Allen bolt and cemented the splits with the same Bob Brownell "Accra-Glass" epoxy. This worked for the duration of my three-month safari.

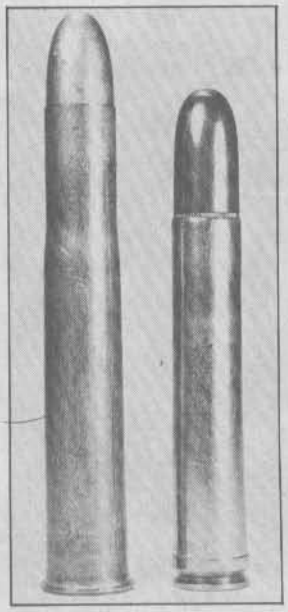
I found the feeding of the .458 to be re-

PHOTO BY LEONARD LEE RUE III

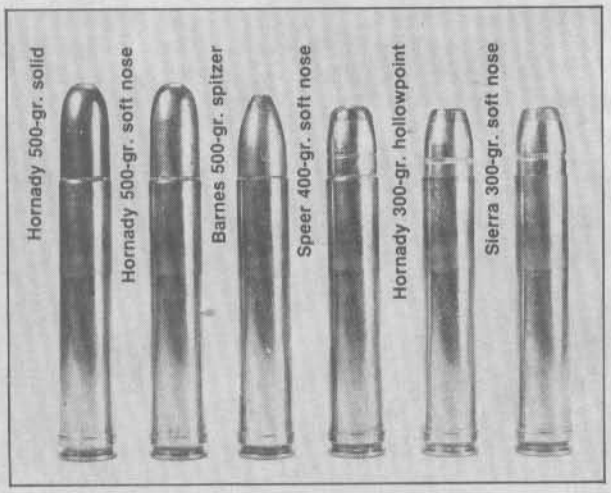
markably smooth, and I never had so much as a hint of a jam with soft-nosed or solid ammo. The accuracy of the 25-inch Winchester barrel was superb, and that length added a bit of muzzle jump damping in recoil, as well as giving substantially more velocity with no more powder and pressure. The rifle swung and fired offhand in the steadiest possible manner, and the single-stage Model 70 trigger at four crisp pounds of pull was ideal. I found the 25-inch barrel quite handy, even in the densest cover, since I don't hold a rifle to the shoulder and swing it until I line up the sights on game. I begin swinging my body with the game and the rifle only comes into place when the shot is fired and is more or less "poked" into position near the terminus of the swing. By using plenty of rifles with 22-inch and shorter barrels, I have found that these can also catch in vegetation, which never grows according to one's shooting position or barrel length. I also employ good African trackers and usually know the game's position before I shoot so that I invariably choose the clearest position for visibility and the shot. Professional hunters like Wally Johnson and Harry Manners who always used 25-inch barreled .375 Model 70s never complained about them for dense cover.

The "African" always hangs low on the shoulder when slung because of the barrel-mounted sling studs, thereby avoiding catching in vegetation. Another point about this barrel sling stud mounting is that it prevents one's forward hand from slamming into a forearm-mounted stud in recoil. All in all, the two-recoil bolt "African" was an exceedingly well designed and constructed piece of professional hunter quality. Today's post-64 Model 70 .458 is also a fine rifle, in some ways better than the original.

I got the bright idea that the way to load the .458 for buffalo was to load a soft nose in the chamber, followed by alternating solid, soft, solid loads. This is what I had in my .458 the morning of September 18th, 1959 along the south bank of Mozambique's Revui River. Just after dawn, Wally Johnson, Sr., my guide, our two Shangaan trackers and I were spooring up a small party of buffalo bulls on their way back into the dense riverine bush where they would spend the hot part of the day after drinking. We confronted the three bulls after half an hour, facing us by an ant heap. I aimed my Winchester at the base of the lead bull's throat and double-checked to make sure I was on. I did so coolly, but too deliberately, using up all the time the buff needed to decide it was time to get the hell away. The 510-grain soft-nose load shattered the eerie stillness of the bush as the buffalo turned and ran across our right front as if untouched. I quickly reloaded at the shoulder and fired my second round—a solid—but no reaction. The three bulls galloped off to the right together, and Wally thought I'd missed both times. I told Wally that this was impossible since I had called both shots. Wally and the trackers rushed ahead to check spoor and we saw where the lead bull, my bull, had turned off from the others' spoor—a sure sign of a hit, but no blood. Soon, the leading Shangaan returned holding a leaf with a big drop of blood the size of a quarter. Holding up the leaf, the tracker's one-word statement "*gazi*" (blood) struck like



Although it appears to be dwarfed by the .500/.465 Nitro-Express beside it, the .458 is actually very close to it in ballistic performance, having been designed to equal the big British elephant rounds.



The .458 Win. Magnum is popular with handloaders. Armed with a vast array of propellants and bullets of every shape and description, they churn out cartridges that are loaded down to the level of the .45-70, or those that are juiced up to peak levels for the "most powerful non-proprietary cartridge in the U.S."

Introduced by Winchester in the mid-'50s, the .458 Win. Mag. found its first vehicle in a special edition of their much-loved Model 70. This "elephant stopper" rifle was called the "African." Many firearms firms have since produced entries chambering the .458 Mag., among them Colt with their Sauer-made "Grand African."

Pre-64 Winchester Model 70 "African"

Colt-Sauer "Grand African"

Contemporary Win. Model 70 "XTR Super Express Magnum"

thunder! I'll never forget the grim look in Wally's blue eyes as the unavoidable sank in. "We'll just have to go in there and get him," was his joyless comment. The bush along the Revui is among the densest of anywhere I've been, and about the worst possible sort of stuff in which to do battle with a wounded Cape buffalo. Up to the moment of wounding him, the show had been on my terms, but now it was *inyati's* turn to even the odds—on grounds of his own choosing. And even the odds he almost did, but for Wally's stark courage and quick shooting!

Wally, after a long and twisting follow-up, held a whispered conference with the trackers and told me we were close, then saying he would hunt the buff to the right alone. He told me to stay where I was and then vanished into the thorn thickets. I stood tensely with the Shangaans, then suddenly one tracker pulled my sleeve and pointed as he slipped out of sight. I turned and was eyeball to eyeball to a roaring, pain-maddened charging buffalo! He lowered his head and slammed me up and into a thorn tree, then tossed me again as I tried to rise, my rifle having been knocked to one side. I tried again to right myself, but the buff kept in there hooking with his horns. I instinctively remained on the ground, turning and rolling to avoid the points. Suddenly the inyati stopped as I rolled into a shallow dry stream bed and faced him as he hulked black and lethal while I—anything but lethal minus my .458—crouched like a dazed mouse awaiting the cat's pleasure! Then what seemed a long pause followed by five rapid shots—my .375 with Wally—then a long pause and three more shots. I saw the buff move off and into thick bush, but I still couldn't see Wally, who I dimly realized must be the shooter. Wally rushed over to me and breathlessly asked, "Where's your four-five-eight?" "Must be by the buff!" was my reply. "Isn't he dead?" "Hell no, he's ready to charge again!" came Wally's grim reply as I unbuckeled my big cartridge belt, thinking that if the nine shots wouldn't do it, Wally might need 40 more! Then I heard two heavy reports from my .458, and Wally and the Shangaans rushed over to me and helped me assume a standing position while they ran their fingers under my shirt, feeling for the usual "*cornada*" (horn point wound). Fortunately there was none—only the central horn boss had connected, thanks to my rolling movements.

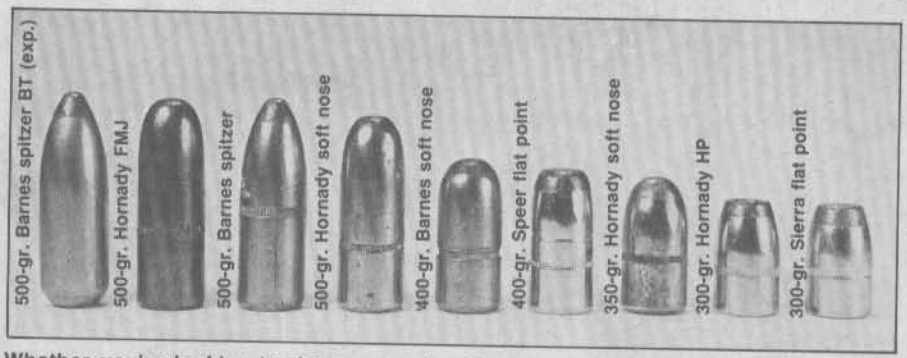
I was assisted to the buffalo carcass which even in death was awe-inspiring—a brave beast who Wally said didn't leave his feet until his last shot, a .458 soft nose right through the back of the head! Wally's first shot with the .458—shot number 10—was in the neck and missed the spine. It had been close, but the fault was mine, not Wally's nor the .458's or the .375 Holland's. If my first shot had been delivered as intended and I hadn't waited so long, and probably, if I had used a solid, the remaining 10 shots would have been unneeded ones.

An autopsy revealed that the first round had angled through the ribs of the right side and mangled itself into a shapeless blob in the water-logged stomach grass. The second shot, a solid, had struck centrally on the shoulder but had deformed into a knoblike mushroom, then deflected into the paunch after traversing and raking only nonvital areas. This reverse "miracle" had ensured that the fight would go on for some time and truly, the odds had been evened!

My own injuries were not internal, except for broken right ribs, but my right cornea was scarred and an infection soon set in there in wildest Mozambique where there were no opthalmologists. I was also covered with sundry cuts and bruises including a torn left thigh muscle. Three days later I entered the Umtali, Rhodesia hospital where a kindly and skilled semiretired London opthalmologist, Dr. Sy Corner, saved my right eye and cured the infection with penicillin.

This and other experiences have made the Winchester .458 rifle and cartridge an inseparable part of my life, not only for its having saved my life in Wally Johnson's hands, but as my main heavy rifle in Mozambique, Rhodesia's Zambesi Valley, the plains of Matetsi, the Gazuma Forest, Nuanetsi's low veld and Nyasaland's Rift Valley.

The caliber has a well-deserved reputation for accuracy in factory 500-grain loads or in handloads down to 350 grains, and it is now a standard production rifle chambering for domestic, European and Japanese factory rifles. It is also chambered in bolt action rifles made by South Africa's Musgrave company of Bloemfontein, Orange Free State. The ammo is made by



Whether you're looking to drop a charging lion or simply wish to eradicate a pesky tin can, the .458 Win. Mag. can accommodate you! This impressive lineup of jacketed bullets bears testimony to the caliber's flexibility and handloading potential.

***G&A* Shooting Editor John Wootters is jubilant over this handsome Cape buffalo bagged with one clean shot from his .458 Win. Mag. Thick-skinned game require a heavy projectile to effect deep penetration. John used a 500-gr. Hornady FMJ.**

Winchester-Western and Remington-Peters in this country, and by Belgium's Fabrique Nationale (F.N.). No other solid can top the .458 with its heavy steel jacket as made by Winchester and Hornady, with its great .350 sectional density.

The original velocity with the standard 500-grain solid bullet was listed as 2,130 fps with energy of 5,040 ft. lbs. from the original 25-inch barrel. Today's Winchester Model 70 .458 "African" has a 22-inch barrel, and Remington's "Safari" .458 and .375 have a 24-inch barrel. Accordingly, the SAAMI standard U.S. velocities are listed based on a 24-inch length of barrel, or 2,040 fps and energy of 4,620 ft. lbs. for the solid load. This is the correct load for thick-skinned dangerous game like Cape buffalo, rhino and elephant. The lower velocity now listed reflects more than is accountable for the two inches less barrel length. It also reflects a reduction in powder charge, as confirmed by my pulling the bullets and weighing the charges. This was a wise move, in view of the ultra-compression of the original charge of fine-granuled nitrocellulose. This compression impacted the powder granules into an almost solid mass which could only be picked out with an instrument such as a small screwdriver.

This impacting of powder granules led to rare instances of incomplete combustion and a corresponding loss of velocity and penetration. Our own tests with an Oehler chronograph revealed an average of 1,975 fps from a 24-inch barrel, using current 500-grain factory loads. Though still very potent, this falls short of the .470 power level the .458 was originally designed to reach. There is a way to improve on this. The remedy is a powder of fine granulation and higher energy content than that of single-base (IMR nitrocellulose) powders. The Hercules Powder people produce such a powder in their excellent Reloder 7 double-base powder (nitroglycerine and nitrocellulose combined). It has the right energy to produce 500-grain loads with a velocity of 2,050 fps and moderate pressures. I'm quite happy with this velocity with Reloder 7—a powder of the finest granulation, but like Carroll Shelby's Tejano chili—chock full of energy!

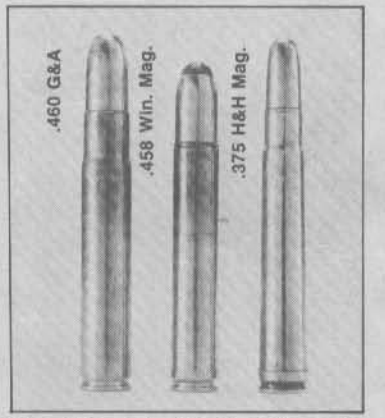
For those who enjoy reduced .45-70-type handloads with jacketed or cast bullets, the .458 makes an ideal woods caliber for deer and black bear. By no means is the .458's natural habitat only Africa. It is equally at home in the downed timber of Idaho's Selway wilderness, Alaska's coastal wetlands jungles or the thickly timbered Pacific Northwest for elk, moose or big bears. It's more gun than needed, true. One can load down if desired, but this isn't necessary—factory stuff in 510-grain "blue-nose" works superbly on such game—and from any angle, right up to 200 yards. This business about being suited only for open sights is rubbish—a scoped .458 makes a superbly accurate precision rifle if low-powered optics with long eye relief are used.

The commercial success of the .458 is far beyond anything Winchester could have imagined for an "African" rifle and caliber, especially with so many domestic and imported production rifles chambered in .458. By any standard, this mass demand represents far more than is attributable to African safari use, even if Alaskan bear hunters are added. The only explanation seems to be that many chaps simply like having a rifle in the heaviest standard American factory caliber in their gun racks. Even if the biggest game hunted by such a proud .458 owner is mule deer, it makes a great conversation piece when a shooting pal drops by, and it can be a status symbol.

The Clint Eastwood movie, *Dirty Harry*, boosted the sales of Smith & Wesson Model 29s in .44 Magnum caliber, and this fact is apt to obscure the related fact that "Dirty" also used a Winchester Model 70 .458 "African" during his rooftop counter-sniper battle with the loco villain. Though a fatuous choice for counter-sniping ordnance, such highlighting of the piece gave it an aura of "glamour" and probably increased the demand. Then there are the collectors of one-each of a line of rifles such as Remington Model 700s, Winchester Model 70s or Ruger No. 77s, all having .458 chamberings. Others enjoy handloading the big bores with reduced loads for plinking. Still others are the "rock busters" who do battle with granite boulders, and some even hunt varmints with their .458s, brushing aside any ridicule or charges of "inadequacy"! Face it—the .458 is accurate, fun to own, and fun to shoot (though not often from a bench with full loads!).

Whatever the reason for owning a .458, the obvious motive continues to be its use for the biggest and most dangerous game. In Africa, the .458 has replaced the .470 double as the most popular "heavy backup," and more guides carry .458s than any other caliber. The return of .404 (10.75x73) ammo production by Dynamit Nobel (RWS brand) and B.E.L.L.'s recently introduced .470 ammo production has caused some reversion to .404 Mausers and .470 doubles, but the .458 is still the leader in big bore (heavy caliber) rifle and ammo sales. Most game control hunters of elephant and buffalo in game reserves and national parks use .458s for "culling" overstocked big game. England's Holland & Holland and Belgium's Auguste Francotte adopted the .458 as their house big bore for their posh doubles, though Holland now also offers .470 doubles for B.E.L.L. ammo as made here. In fact, if all African hunting ceased tomorrow, I suspect that the demand for .458 rifles and ammo would continue—if slightly reduced—and that factory chamberings and ammo production would continue for the foreseeable future. That's just how popular this .30-06-length cased heavy is!

The hinged floorplate allows for a rapid ammo change as the situation dictates. However, the floorplate latch must be strong or the floorplate may fly open under a big bore's recoil!



The .458 and .375 Magnums are classic factory loads for African dangerous game. The .460 G&A is a bruiser of the wildcat breed.

The author believes that the Ruger No. 1 in .458 can be a good choice for dangerous game, particularly with the back-up of a professional hunter. This rifle is well suited to rechambering to any of the larger .45 wildcats like the .458 Lott.

CHAPTER 11

ULTRA MAGNUM WILDCATS

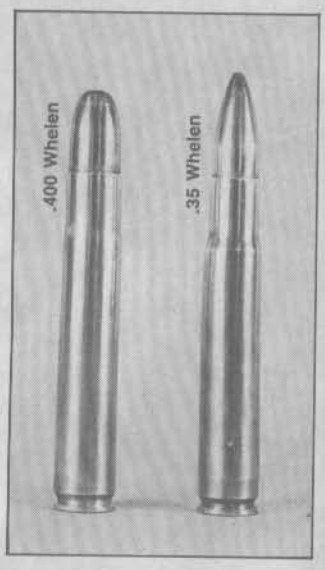
Customized cartridges and rifles used to be the only American big bores. Today there are few "power gaps" left to fill, but the search for greater power and improved performance goes on!

Big bore wildcats are a special breed which still fill gaps amid the array of factory big bores. By definition, a wildcat cartridge is one which is not factory-produced but which is designed to use modified factory cases and standard bullets. However, a wildcat can also be created from original nonstandard components. Other cartridges can be nonstandard but experimental cartridges which are being tested by commercial ammo and firearms companies. A proprietary cartridge is a nonstandard cartridge which is factory produced exclusively for a single company as a house caliber, such as the .416 Rigby or any of the Weatherby magnums. Sometimes wildcats become factory or proprietary rounds, as was the case with most Weatherby magnums, including the .460 Buhmiller, a necked-up .378 Weatherby Magnum case.

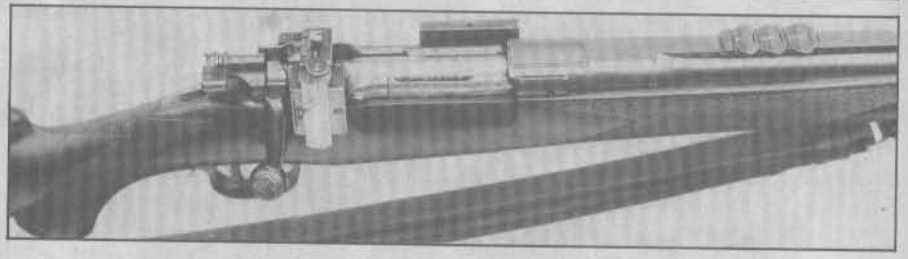
With the medium-large bore magnums there are few gaps in the lineup of commercially available options from the 8 mm Remington Magnum, the .338 Winchester Magnum, .340 Weatherby Magnum and .375 H&H Magnum to the .378 Weatherby Magnum. It is when we go above .375 caliber that we get into the real power and caliber gaps—a situation partly caused by the cessation of Britain's Kynoch production of their historic line of nitro-expresses in the late Sixties.

Some wildcats or semi-wildcats are the "improved" cartridges which permit the firing of factory cartridges in the "improved" chamber and thereby "fire-form" a larger capacity case for more powder and velocity. Such "improved" chambers allow us to use factory ammo in emergencies or to make "blown out" cases, which is the costly way to do it. The .375 H&H Magnum was the popular object of the "improved" cartridge designers a few years back, with several versions, including the .375 Saturn, the .375 C.C.C. and the .375 Weatherby Magnum, which is unique in having become a regular Weatherby caliber. It is now obsolete since the advent of the more powerful .378. The disadvantage of such "improvements" is that when factory rounds are fired in the larger "improved" chambers, the original factory muzzle velocity is reduced. The enlarged chambers acts exactly like a less-than-maximum or reduced load when standard cartridges are fired, depending on how much loading density was lost.

The use of "belted" cases has simplified and made safer the fire-forming of brass for "improved" or original wildcats because whatever the shoulder dimensions, the "belt" is always there to headspace on. Whatever is forward of the "belt" fire-



Two of the earlier wildcats, dating from the 1920s, are the .35 Whelen and the .400 Whelen (right). Elmer Keith was a great booster of both these rounds. Below is his Springfield-actioned .35 Whelen made by Griffin & Howe.



forms into the configuration that was built into the chamber. Fire-forming rimless cases is more critical and potentially risky because an "improved" rimless case can have only minimal headspacing register at the point of convergence of the neck diameter and the shoulder angle. This must be a slight "crush fit" or snug contact or else excessive headspace will occur in firing factory or other standard dimensioned ammo.

There are even "improved" wildcats, and none better known than the "improved" .35 Whelen, in Ackley's version, or the .35 Brown-Whelen, which is more complex than the straightforward Ackley improvement. The .35 Brown-Whelen has the shoulder moved forward to increase the body length, but to do so, one must expand the neck to a cylinder and then neck down, a difficult and time-consuming activity requiring neck annealing. Such "improvements" do not permit the firing of standard dimensioned cartridges since the chamber shoulder is too far forward for a standard round to headspace on. Another so-called

***G&A* Eastern Field Editor Jon R. Sundra devised his own .375 JRS wildcat based on the 8 mm Remington Magnum case necked up to .375 for use in his rechambered Ruger No. 1 (top). Cases can be formed by necking up 8 mm Rem. Mag. brass with a long tapered expander (above left) or by fire-forming .375 H&H Mag. factory rounds. The .375 JRS (left) is very similar to several other "improved" .375 Magnums.**

"improved" factory cartridge is the .375 JRS of Jon Sundra, which is based on the 8 mm Remington Magnum case. Its advantage is that fire-forming isn't necessary to make cases, but only an expanding plug. However, it is like the .375 Weatherby, an "improved" chambering which allows, with some velocity loss, the use of factory .375 H&H ammo.

Most modern big bore wildcats are based on basic .375 H&H Magnum brass, and the progenitors of such wildcats are typified by such pioneer examples as the .334 OKH of Charles O'Neil, Elmer Keith and Donald Hopkins. It is typical of early belted wildcats in that it has more body taper than the archetypical modern belted wildcats by Ackley, Apex and others with minimum body taper and sharp shoulders. With the advent of Winchester's .338 Magnum there was no longer a need for a .33 caliber belted wildcat short magnum, although a demand does exist for .338 wildcats on the .30-06 case for shot-out rebored .30-06 rifles. The demand, however, for full-length .338, .358 and .375 wildcats continues. The .340 Weatherby Magnum is such a round but in a proprietary factory cartridge, and as did the .300 H&H Magnum, its advent inspired a wildcat with higher velocity levels—the .338-.378 KT of Elmer Keith and the late Robert W. Thompson. Keith regards the .338-.378 KT as the ultimate plains or stalking rifle magnum, and knowing its ballistics, I'm not going to dispute that. It is based on the massive .378 Weatherby Magnum case and uses .338 caliber bullets as for the .338 Winchester Magnum and the .340 Weatherby Magnum. It has been chambered in several Champlin rifles and used in North America and Africa by Elmer Keith, the late Robert W. Thompson, Bill Jordan and the late Truman Fowler. It obtained 3,008 fps with a 250-grain bullet and 103 grains of H4831, 2800 fps plus with a 275-grain Speer bullet and 103 grains of H4831, and the same load of H4831 gave the 300-grain Winchester .338 bullet 2,700 fps.

Here is a good place to point out that H4831 or Hodgdon 4831 loads should not be interchanged with loads of Du Pont or IMR 4831 because the Du Pont IMR 4831 is slightly faster burning. For IMR (Du Pont) 4831 reduce H4831 loads by 10 percent and work up to safe loads by checking for obvious pressure signs—expanded rims, excessively flattened or extruded primers and hard extraction.

Bill Jordan shot Cape buffalo with the .338-.378 KT with 250-grain Nosler Partition Jacket bullets, but we do not recommend using any caliber under .375 H&H Magnum on Cape buffalo. Preferable for this toughest of all African dangerous game is a .40 caliber or over magnum with a minimum bullet weight of 400 grains and energy over 5,000 ft. lbs.

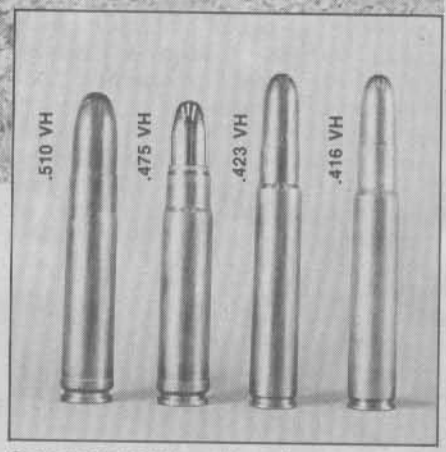
Keith designed the .338-74 Keith based on the excellent 9.3x74R rimmed case using RWS (Dynamit Nobel) Boxer-primed cases necked down to take .338 caliber bullets. Keith informed me that with 76 grains of H4831 and a 250-grain bullet he gets .338 Winchester Magnum velocities, with either the Nosler Partition or Sierra's 250-grain boattail. He also obtained fine groups using Speer's 275-grain bullet. Keith likes .33 caliber in preference to .30 caliber for the long-range stalking rifle because with high ballistic coefficient spitzers and boattails, the remaining energy is greater. Superior stopping power results from having a greater frontal sectional area than .30 caliber. Keith has a good point here and it can all be done in manageable and portable rifle weights.

The next caliber up from .338 which still attracts many wildcatters is .358. It is, of course, the caliber of one of the first successful wildcats, the .35 Whelen, a still popular and economical wildcat which transforms a rebored .30-06 into a first class Alaskan caliber and which uses cheap and plentiful .30-06 brass. I doubt if the "improved" version with but five percent more powder capacity makes much difference, or enough to warrant departing from the original .30-06 shoulder angle, which makes case forming easy.

Among the belted .358 caliber wildcat magnums is the .358 Belted Newton, a short magnum, as are the .35 Ackley Magnum, the .350 Mashburn Short Magnum, .35 Apex Magnum and my favorite, the .338/.358 Short Magnum. This latter is merely a .338 case with the neck expanded to accept .358 caliber bullets. It does anything the other .358 short magnums do, but case making is a breeze and performance is fully up to .35 Newton levels. Full-length .358 magnums such as the old .350 Griffin & Howe Magnum are made from .375 H&H Magnum brass, and among these are the .350 Mashburn Super Magnum and the .35 Ackley Magnum Improved. A similar .358 magnum is the .358 Barnes Supreme. With 225-grain or 275-grain Bitterroot bullets, 250-grain Speer semi-spitzers or Barnes bullets, the .35 magnums offer optimum performance for

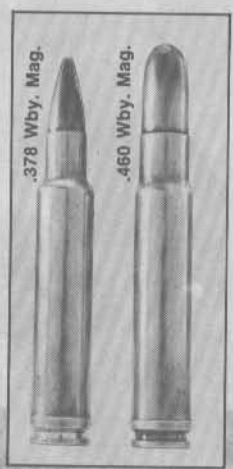
the largest North American game, and they are not too powerful for mule deer. They make an ideal elk caliber and also work well for grizzly, brown bear and moose.

The .375 caliber is not one which really needs wildcatting as does .35 caliber with no current factory cartridges available of the magnum persuasion. This is because the great original .375 H&H Magnum is at an optimum level of performance with existing bullets, exemplified by the near-2,600 fps velocity of factory 300-grain loadings and the over 2,700 fps velocities of the 270-grain bullets. With handloads and reasonable pressures the factory velocities can be battered slightly with suitable slow-burning powders like 4350. For those wanting more velocity than provided by the .375 H&H Magnum, the .378 Weatherby Magnum fills the bill. Weatherby's dropping of their former .375 Weatherby Magnum bears this out. There are, however, reasons other than higher velocity in desiring wildcats. A short, fat .375 Magnum wildcat can be made from the .378 Weatherby case or from the .404 (10.75 x73) case, which equals the .375 H&H in capacity but which is only 2½ inches long instead of the .375 H&H case length of 2.850 inches. I designed the .375 G&A Magnum to provide more than standard powder capacity but to utilize factory .375 H&H magazines and bolt faces. It is made on the .404 case with the shoulder moved forward and minimum body taper. Its power range is midway between the .375 H&H Magnum and the .378 Weatherby Magnum. However, my investigations have satisfied me that "improved" .375 Magnums and other .375 magnum wildcats do not offer any practical improvement over the original factory .375 H&H. It just happens to be one of those dependable calibers with a near-perfect balance of diameter, good bullets, flat trajectory, penetration and shocking power. My African experience in firing almost 800 factory .375 H&H loads at game with no complaints about performance is the ultimate convincer, and this is backed up by every guide I know. Even the .378 strains the limits of the caliber's capabilities, and experience dictates that a significantly heavier caliber is the best way to go if your .375 H&H Magnum isn't enough.



Gunsmith Gil Van Horn has created a series of big bore wildcats based on the .404 and .460 Wby. cases. At top, author Jack Lott fires a .416 Van Horn.

With today's wide ranging big bore power slots well filled as with lesser calibers, it is not always improved ballistics which motivates the big bore wildcatter. More often the justification for a wildcat is a mechanical quality lacking in the factory product. Keith's .338-74 is an example which offers no better ballistics than the .338 Winchester Magnum, but by using the 9.3x74R rimmed case it is better suited to falling block single shots or double rifles. Gil Van Horn's short magnums based on the .378 or .460 Weatherby case shortened to 2½ inches permit the use of standard-length actions, but performance is equal to that of full-length wildcats based on the .375 H&H Magnum case.



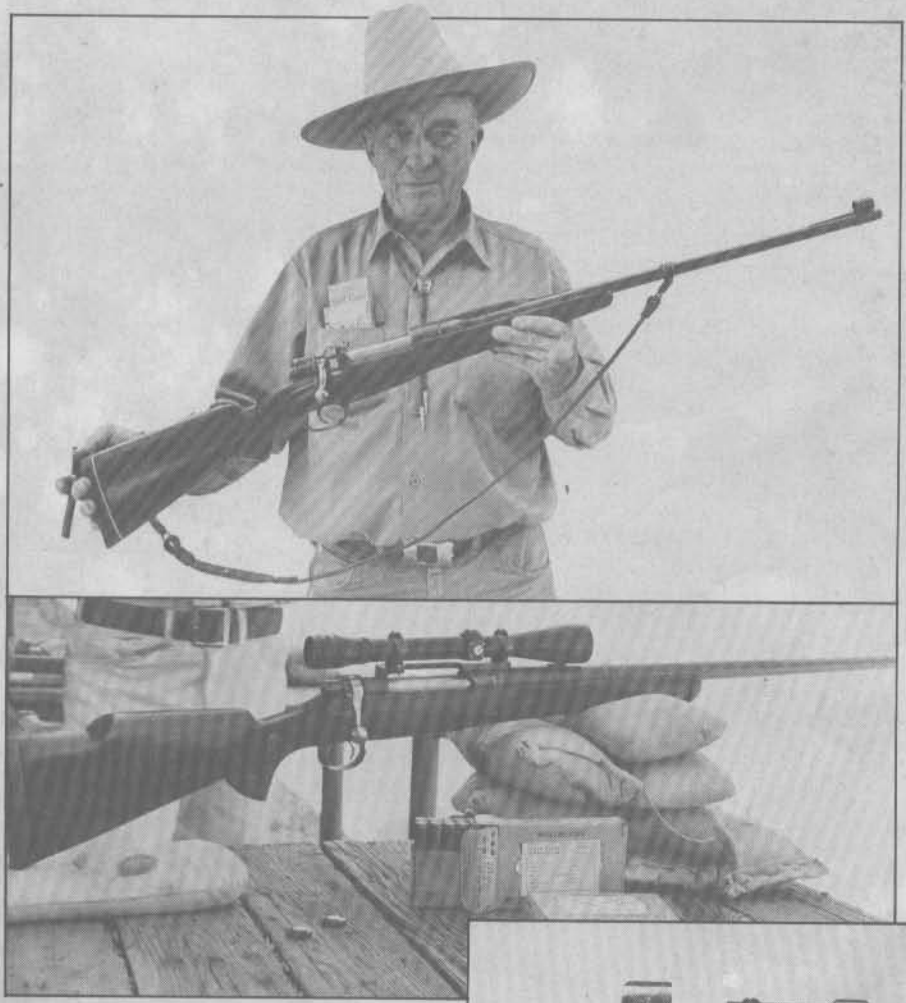
The late John R. Buhmiller was an outstanding African hunter in the 1950s. This American did a lot of experimentation with big bore wildcats. He necked up the Weatherby .378 case to .458 to create the .450 Buhmiller that was to become the .460 Wby. Mag.

My own .450 G&A Short Magnum was designed for owners of .458 Winchester Magnum caliber rifles with standard-length actions and magazines so they can use their rifle's unmodified action and obtain more velocity and load flexibility. They can do so because the .450 G&A Short Magnum case is slightly fatter than that of the belted .458 case. It uses the .404 (10.75x73) basic case with minimum body taper and has no belt. Performance exceeds by up to 300 fps that of top loads for the .458. Cases for the .404 with Boxer primer pockets or straight basic .404 brass are available from either Dynamit Nobel (RWS .404 cases) or basic .404 brass from B.E.L.L. (Brass Extrusion Laboratories). The .450 G&A Short Magnum's 2½-inch case is designed to clean up original .458 Winchester Magnum chambers, and use the original bolt face. It has more capacity and still can use the original bolt face because it is a rimless case with no belt, but its rim diameter is very close to that of the belted case.

The .460 G&A, on the other hand, is a

full-length .458 caliber magnum based also on the .404 (10.75x73) case but with the shoulder moved forward and the sidewalls straightened out. It is designed to provide optimum performance in .458 caliber, which lies at around 2,300 fps—2,350 with a 500-grain bullet. It is based on the concept of such a cartridge by Tom Siatos, *Guns & Ammo's* Executive Publisher. It is for the fellow who wants a .458 caliber magnum with a velocity and power range between that of the .458 Winchester Magnum and the .460 Weatherby Magnum. Suitable actions must be of magnum length for the 2.800-inch length case, such as the magnum Mauser, Brevex, converted Enfield 1917 or Pattern 14 actions, Remington Model 30 or 720 actions, Remington 700 and other suitable magnum length or opened-up, standard-length actions. The .460 G&A is adaptable to more actions than the .460 Weatherby Magnum, and with a drop magazine it offers a four-round magazine capacity plus another round in the chamber.

Gil Van Horn used the .460 G&A as the basis for his .416 Van Horn and the .423 Van Horn, the latter using the .423-inch bullets for the .404 and the 10.75x68. Van Horn has become a prolific wildcatter with his big bores and has made some very fine express rifles for them. Gil's .460-.416 is a full-length magnum on the .460 Weatherby Magnum case. Gil has three .30-06 (2½-inch length) magnums on the shortened .460 Weatherby case: the .338 Van Horn, the .475 Van Horn and the .510 Van Horn. The shortened .460 case permits the use of standard-length actions, but it isn't a project for anybody's garage workshop because it takes lots of skill to make those four-round drop magazines and to secure reliable feeding.



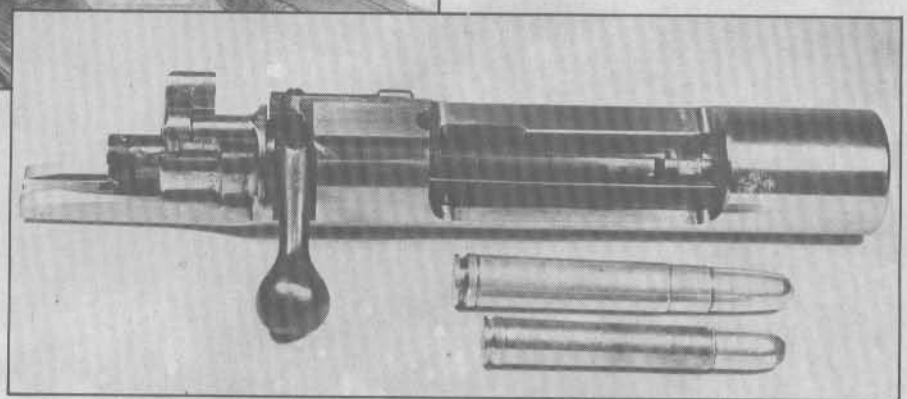
Elmer Keith has done much to pioneer medium and big bore wildcats. At top, he displays his Hoffman Arms custom .400 Whelen. Below is a customized Enfield chambered for his own .334 OKH wildcat—one of the first .33 magnums.

Van Horn didn't furnish loads or ballistics for his .338 Van Horn, but his .423 Van Horn on the .404 case gets 2,726 fps with a 400-grain bullet, 104 grains of H-205 and the Federal No. 215 magnum primer, which he uses exclusively. The .416 Van Horn with the same basic .404 case and a .416-inch bullet of 400 grains does 2,713 fps with 101 grains of 4350. The .460-.416 Van Horn on a 2½-inch basic .460 Weatherby case does an estimated 2,700-plus fps with 113 grains of IMR (Du Pont) 4831. The .510 Van Horn with the same 2½-inch basic case, a 600-grain Barnes bullet and 90 grains of 3031 does an estimated 2,300 to 2,400 fps.

Another .416 caliber wildcat with a following is the .416 Chatfield-Taylor, named for the well-known sportsman Robert Chatfield-Taylor. It is the .458 Winchester Magnum necked down to accept the .416 Rigby bullet weighing 400 grains. The original .416 Rigby's ballistics were a 410-grain bullet at 2,371 fps. With a top load, the .416 Chatfield-Taylor is claimed to obtain 2,320 fps with a 400-grain bullet. Whereas Rigby's original .416 case is unduly large for available actions other than used magnum Mausers, Brevex or modified 1917 Enfields or Pattern 14s, the .458 case is on the small side. For this reason, Gil Van Horn and Ken Howell, editor of *Handloader*, brought out their versions, which substantially exceed the velocity of the Rigby original.

The .416 caliber has received a boost in the form of 400-grain steel-jacketed solids by Hornady, which are not available from Hornady, but solely from J.B. Hodgdon, Huntington Die Specialty Co. or Brass Extrusion Laboratories (B.E.L.L.), the reason being that the entire lot of bullets was a special order.

The .423 caliber (.404 or 10.75 mm) has long been a wildcat caliber since the advent of the .423 OKH developed by Charles O'Neil for Elmer Keith and Donald Hopkins in the late Forties, with both a long and short version on the .375 H&H Magnum case. In those days, Barnes or Kynoch bullets were used, but the immediate postwar Kynoch solids used weak gilding metal jackets and would fracture on bone impact. Barnes .049-inch jacket thickness solids work fine, and even better are the Dynamit Nobel (RWS) steel jacketed 400-grain solids. Excellent Boxer-pocket .404 cases are available from Dynamit Nobel U.S.A. (RWS), as well as from



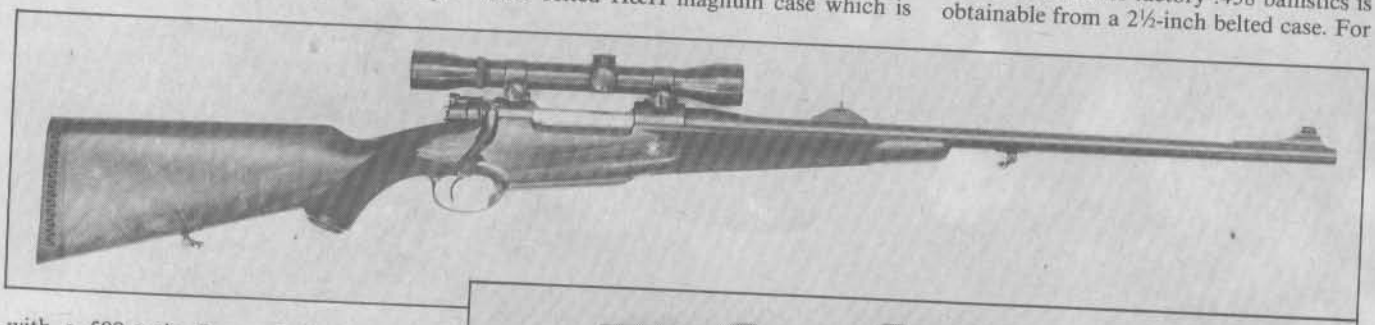
Fred Wells of Prescott, AZ custom makes magnum-length Mauser actions and designs wildcats to go in them. His .510 Wells dwarfs a .458 Winchester Mag beside it.

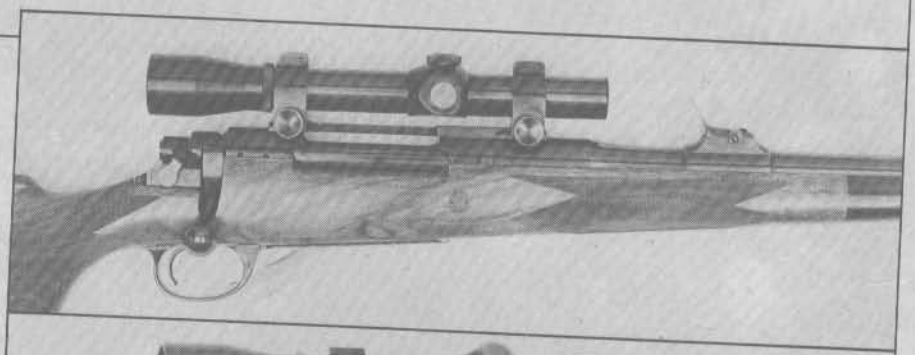
B.E.L.L., in .404 form or as basic cylindrical brass. The wildcat possibilities of the basic .404 case are multiple, as we have learned. I originally designed a whole series of G&A wildcats using the basic .404 case, and all but one (the .460 G&A) are designed to replace existing factory calibers by cleaning up their chambers with no bolt face or magazine changes. This led to the .338 G&A, the .375 G&A, the .404 G&A and the .450 G&A Short Magnum.

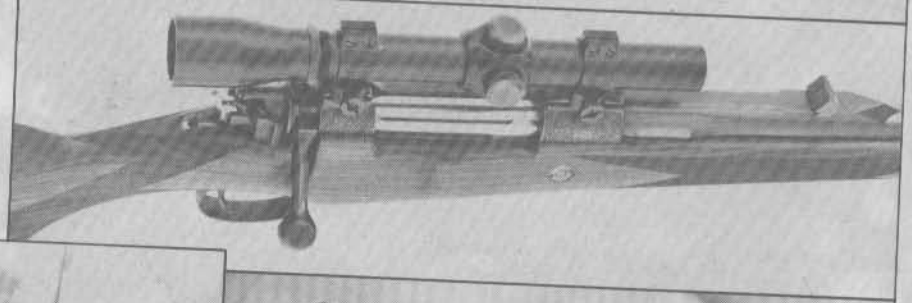
At the time of his death, the late John R. Buhmiller was perfecting his .423 Magnum based on the .378 Weatherby case. "Uncle John" claimed this round with its belt and most of the taper removed got 2,700 fps with a 500-grain Barnes bullet and 120 grains of H4831—almost too much! It produced over 8,000 ft. lbs. of energy! His load with 400-grain bullets was 125 grains of H4831, but he provided no velocity. Buhmiller also used Norma belted cylindrical brass on another .423 magnum and got 2,600 and 2,700 fps with a 400-grain Barnes or Kynoch bullet.

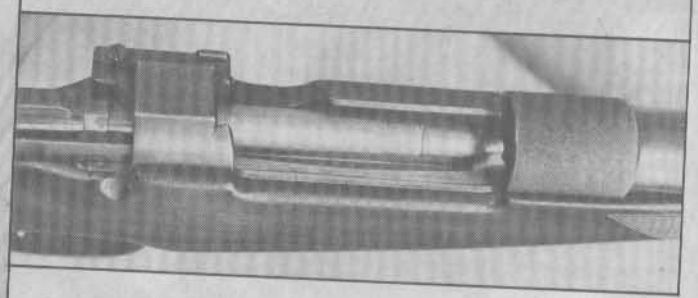
For those making up fire-formed cases for rimless wildcats, Gil Van Horn's system is wonderful. With belted wildcats, the "belt" does the headspacing, but for rimless cases such as the .450 G&A Short Magnum or Gil's .423 Van Horn there is nothing to headspace on. Gil puts a sheet of suitably thick home-canning paraffin on the underside of a workbench and presses the mouth of the case against the paraffin to obtain a plug, after loading 25 grains of Bullseye pistol powder in the case. It really works. But you must hold the rifle vertically while firing so the case head stays against the bolt face.

The most popular caliber over .40 is .458 caliber, and for good reason. There are plenty of excellent expanding and solid bullets available to select from, and .450 caliber is still the basic elephant, rhino and buffalo caliber as established nearly 85 years ago by Rigby's .450 3¼-inch Nitro-Express in Africa and India. Winchester's extremely popular .458 is another reason for the caliber's popularity. Among .458 caliber wildcats are the old .450 Watts or Ashurst using the straight-tapered Norma basic belted H&H magnum case which is no longer made. It is a long case and one can't make .450 Watts or Ashurst cases from necked-up .375 H&H Magnum brass because it shortens to less than 2.850 inches. It was the predecessor, in a long magnum, of the .458 Winchester Magnum and was used in Africa in the Fifties by Jack O'Connor and others. Today it is rarely seen but it is as good as any of the various full-length .458 magnums on the full-length .375 H&H case such as the .450 Ackley Magnum or the .450 Barnes Supreme. The Barnes-Johnson .450 B-J Express is a short magnum or "improved" .458 Winchester Magnum and claims 2,200 fps with a 500-grain bullet. It was the first "improved" .458 cartridge, but not enough improvement over factory .458 ballistics is obtainable from a 2½-inch belted case. For

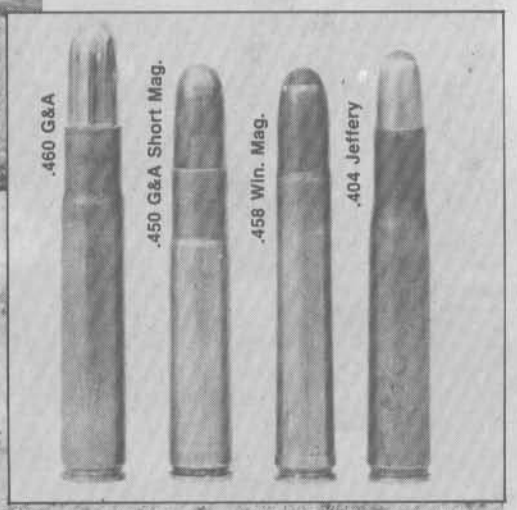








Guns & Ammo's own wildcat .460 G&A (the .404 Jeffery necked up to .458) has an excellent bore to case capacity ratio, and this fine wildcat has been the basis for a number of top notch custom rifles. At top is a .460 G&A built in classic British style on a Brevex Magnum Mauser action by George Hoenig of Boise, ID. Next is the first .460 G&A made by the late Walter Abe for Robert E. Petersen on a Remington Model 30 action. Below that is another superb .460 made by Hoenig for *G&A* Executive Publisher Tom Siatos on a Brevex action. Beneath that is a detail shot of the massive .460 G&A resting on the follower of a Magnum Mauser action. Left: Other wildcats see action in Africa. John Wootters took this lion in Botswana with the .416 Taylor, a short magnum wildcat.



Left: Tom Siatos' Hoenig-built .460 G&A rests against 100 pounds of Tanzanian ivory. Below: The *G&A* wildcats start from the case of the .404 Jeffery. Both surpass the .458 Winchester Mag.

Careful bench testing and load development are crucial to the creation of any wildcat. Above: Author Lott conducted extensive penetration tests in developing the recent .450 G&A Short Magnum. At right: A *G&A* staffer tests the first .460 G&A built by Abe from the bench.

this reason I went to the basic .404 case in designing my .450 G&A Short Magnum. By being slightly larger in diameter and having no belt, there is enough added powder capacity for a 2½-inch bottlenecked case which permits an increase over the .458's muzzle velocity by up to 300 fps.

Among wildcats offered as chamberings by custom rifle companies is the A-Square series of magnums produced by Arthur B. Alphin of RR 2, Box 5A, Leavenworth, KS 66048. A-Square magnums use reformed .378 Weatherby Magnum cases and include the .375 A-Square with a .375 caliber 300-grain bullet at 2,931 fps, the .460 Short A-Square with a 500-grain .458 caliber bullet at 2,451 fps, the .495 A-Square, a .510 caliber .375 H&H length magnum which fires a 600-grain bullet at 2,476 fps and the .500 A-Square which also uses a .510 caliber bullet but a full-length blown-out .460 Weatherby Magnum case and a 700-grain bullet at 2,432 fps. A-Square also furnishes rifles and barrels.

The Winchester Model 71 lever action rifle in .348 Winchester caliber inspired the .348 Ackley Improved, a case with minimum body taper and a sharp shoulder. Bob Hutton tested the rifle and found that a standard factory round fired in the "improved" chamber lost 119 fps velocity, registering 2,350 fps as compared to the original 2,469 fps with a 200-grain bullet. The .348 had a body taper which increased breech thrust, but despite Ackley's criticism, the Winchester engineers had a reason for the considerable body taper. Lever actions lack the extraction leverage of bolt actions, and the extra body taper was to enhance extraction. However, the .348 did not achieve the desired result of replacing the obsolete .405 WCF, and so it was perhaps inevitable that the .348 would be wildcatted for a truly powerful round, suitable, as was the .405, for Alaskan brown bear and grizzly. The wildcat was the .450 Alaskan of Harold Johnson, a gunsmith of Cooper's Landing, Alaska. Johnson's .450 Alaskan became a popular conversion for Model 71 owners, but such modern wildcats should not be barreled to any 1886 action. Harold Fuller took over Johnson's gun shop and introduced the .450 Fuller, which has a 20 degree shoulder instead of a sharp one. There is another lesser-known wildcat on the .348 case, the .40-.348 Ackley Improved, which uses the 300-grain .411-inch .405 Winchester bullet and offers more velocity but generally duplicates the original .405 ballistics in an available case.

Bob Hutton claimed to have obtained 2,060 fps with Ackley's .450-.348 and a 500-grain .458 bullet, using 69 grains of 4064, which is at a .458 Winchester velocity level. This Ackley wildcat on the .348 Winchester case had typical Ackley-type minimum body taper and a sharp shoulder, but it seems to me that such characteristics, which are undoubtedly excellent for a bolt action with its powerful camming action in extraction, tend to make for hard extraction in a lever action.

Here is the proper place to point out that regardless of what you might have heard about using round-nosed bullets with tubular magazine rifles, use *only* flat-nosed bullets. A man firing a .450 Alaskan Model 71

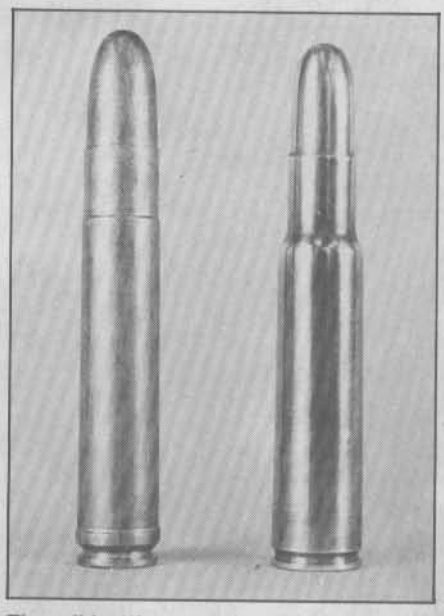
Winchester rifle with full loads and round-nosed 400-grain bullets almost lost his left hand when recoil set off the entire magazine load. One round-nosed bullet set off the preceeding round's primer, which in turn set off the remaining loads. To make flat-nosed 400-grain and 350-grain jacketed bullets from round-nose ones, obtain bullet reforming dies from either Huntington or RCBS.

At the low end of .458 wildcats is the .458 American of Frank C. Barnes, author of *Cartridges of the World.* Barnes claimed the two-inch case round based on a shortened .458 Winchester Magnum case is "in effect a belted .45-70." It is, according to Barnes, for North American game in medium and standard-length bolt actions. It moves a 350-grain bullet 2,260 fps with 52 grains of 4198 and a 405-grain bullet 2,067 fps with 49 grains of 4198 from a 24-inch barrel. This cartridge was developed before the advent of the Ruger No. 1 single shot falling block and the availability of Siamese Mauser actions for rimmed cases. These actions can handle similar ballistics from the .45-70 cartridge, but *do not* attempt such loads in "Trapdoor" Springfields, lever actions or actions other than the Ruger No. 1 or the Siamese Mauser. Since the .458 Winchester Magnum case is only 2½ inches long, it is already short enough to work through standard-length bolt actions such as the 1903 Springfield and the Mauser 98, so for anyone wanting to use a .458 caliber bolt action for North American game in 500-grain, 400-grain or 350-grain weights, the .458 makes an ideally compact cartridge. The advantage of being able to buy ammunition and rifles over the counter makes the .458 ideal for loading down to create deer, black bear and elk loads. For those with Ruger No. 1 rifles in .45-70 or .45-70 Siamese action Mausers, the loading manuals offer a variety of excellent and powerful loads for this caliber.

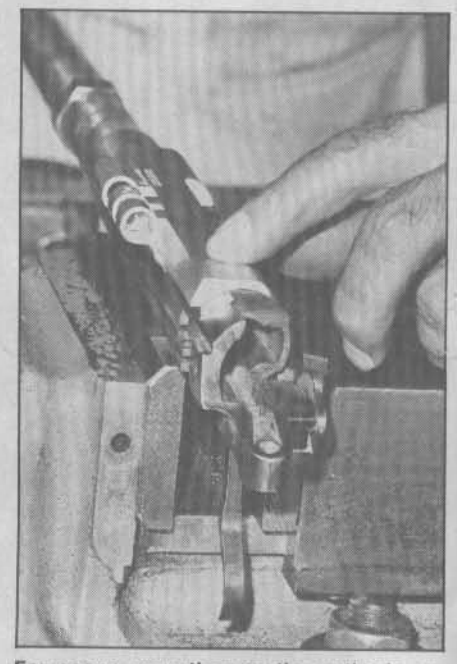
One would assume that there would be no demand for wildcats of over .458 caliber, but there is and has been for decades, including the monster .475 A&M (Atkinson & Marquart) based on the .378 Weatherby Magnum case. It uses the .475-inch bullet for the .470 Nitro-Express in 400, 500 and 600-grain weights and boasts a velocity of 2,980 fps with a 500-grain bullet and 110 grains of 3031, and a 600-grain bullet at 2,502 fps with 105 grains of 3031. Such a velocity as 2,980 fps for a 500-grain .475 caliber bullet is, of course, absurdly excessive, and regardless of construction, any expanding 500-grain bullet at such a velocity will explode on impact. Even at 2,350 fps such a steel jacked solid will exit on broadside shots at Cape buffalo and elephant, a particularly dangerous condition with animals in herds whereby one can unknowingly wound a second animal with the exiting solid.

Gil Van Horn's 2½-inch .475 Van Horn on the shortened .460 Weatherby case is about right in capacity for this caliber and is cheaper to build since it uses standard-length actions. P.O. Ackley's name is connected with wildcats of about every caliber from .17 to .475, and his .475 Ackley Magnum is at the top of his list, based on the now unavailable Norma cylindrical belted brass of .375 H&H basic size. With a 600-grain bullet and 90 grains of 4320 it produces 2,250 fps, a nice velocity for such a bullet. The .475 Barnes Supreme is virtually identical to the .475 Ackley and all such .475 belted magnums produce more "knockdown" on elephant with frontal head shots than any .458 calibers. Over 10 years ago I designed an ultimate .475 caliber magnum wildcat for the late Hans Tanner which I called the .475 L.T.D. (Lott-Tanner-Dinosaur) and its story was published in the *1973 Guns & Ammo Annual.* It was more of a stunt than anything else, but it was also a deadly, practical elephant/buffalo round which used the .577 Nitro-Express case with the rims turned off and made rimless. It equalled or slightly topped the .475 A&M, but in a shorter, fatter case. Frank Pachmayr made an epic magnum rifle for it on a 1917 Remington-Enfield action and mounted one of his Lo-Swing top mounts on it. This mount and the rifle withstood the horrendous recoil, but I must confess that not all those who fired it did! In mitigation, it must be pointed out that the .475 L.T.D. was intended only for *Tyrannosaurus Rex,* the brontosaurus and related varmints—not coyotes! I do not suggest this caliber as a serious option since making the cases is difficult and the case head is really too big for existing bolt faces.

At the top of today's big bore wildcat heap are the monstrous .510 Wells of Fred Wells, the Prescott, Arizona gunsmith, and the .495 and .500 A-Square Magnums previously mentioned. With 600-grain Barnes bullets at over 2,400 fps, any ballistically sophisticated elephant or buffalo would probably pass out if he knew he was being hunted with such calibers! Make no mistake, the .475 A&M and the similar A-Square numbers are serious and practical propositions on the full-length .460 Weatherby case.

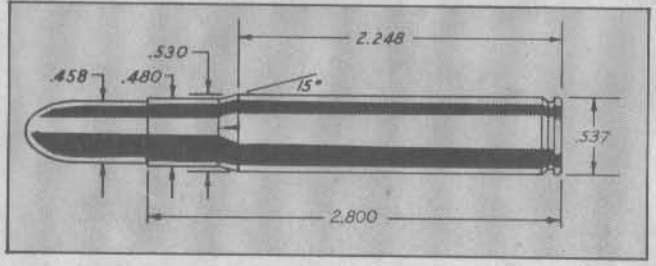


The wildcatting urge has spawned some behemoth cartridges. At left is the .510 Wells. At right is the author's .475 LTD based on the .577 Nitro case.



For scope mounting on the author's experimental .475 LTD rifle built on an Enfield action, a Pachmayr Lo-Swing mount was milled to fit the receiver.

Bob Lee of New York, proprietor of Hunting World and former Angola safari outfitter, is unique in having designed a series of wildcats based on the improbable case choice of the .425 Westley Richards. The .425 Westley Richards Magnum is a "rebated" or reduced diameter rim case based on a shortened .404 case and it actually was the first short magnum. The original rim was reduced to fit standard Model 98 Mauser action bolt faces, but mainly so as to be able to reload rapidly for herd hunting via Mauser stripper clips, five heavies at a time! The .334 Lee Magnum used .333-inch Barnes or .333 Jeffery

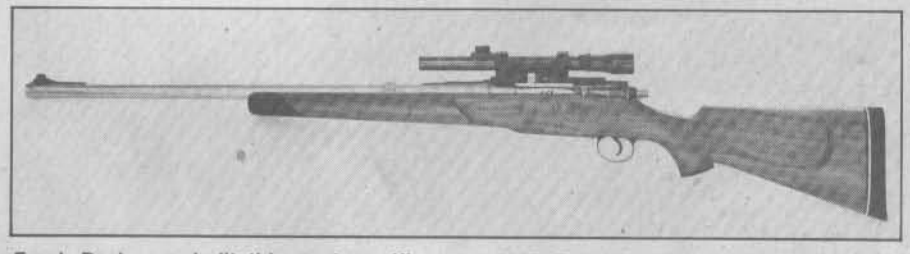


At left are the dimensions for the .460 G&A wildcat. It is based on the .404 Jeffery case necked up to .458. The shoulder angle is 15 degrees to facilitate easy, jam-free feeding. It is a well-balanced big bore.

Kynoch bullets. The .358 Lee Magnum obtained higher than .338 Winchester Magnum velocities with .358 caliber 250, 275 and 300-grain bullets with heavy loads of 4350 and H4831 powders. The .424 Lee Magnum is essentially the .358 Lee Magnum necked up, but it is also an "improved" .425 Westley Richards, since the neck is the same length and factory ammo can be fired in the "improved" chamber. With B.E.L.L. producing .425 brass, the Lee magnums based on the .425 Westley Richards may once more become viable options. I make the modest claim of having designed a wildcat .425 cartridge which makes no claims of improved performance. Why such a cartridge? Because .425 cases were very hard or impossible to obtain, and by reforming and cutting off .404 cases, one could obtain .425 cases by then turning down the rims to .425 "rebated" diameter. I preferred to obtain another Mauser bolt which headspaced and then open it up to take the .404 rims and use the reformed .404 cases without the bother of rebating the rims. This keeps the rifle original for factory ammo when it can be found. I'm glad to report that with the new B.E.L.L. cases, this "wildcat," the ".425 Lott," is not so useful as it was. The only bullets available for the .425 caliber are Barnes 400-grain .435-inch bullets—that's right, .435-inch, the actual bullet size of the .425.

The availability of Boxer-primed rimmed cylindrical cases such as the RCBS basic .45 long case, the B.E.L.L. .500 Nitro-Express 3½-inch basic case and the .50 Sharps 3¼-inch basic cases have inspired new wildcats for various single shot falling block actions and even for double rifles. The rimmed case is the best for double rifles and with no magazine to be concerned about, a single shot or double rifle can use a straight rimmed case as long as deemed necessary within available lengths. I have good reason to believe that pressures for straight-tapered cases are inherently lower than for equivalent-powered bottlenecked cases because neck construction increases pressures. John T. Amber, longtime editor-in-chief of the *Gun Digest*, and now as retired as any unregenerate gun nut can be, informs me of a new line of wildcats which are soon scheduled to debut as proprietary European nitro-expresses. I refer to the ".375 Elsa K" and the ".459 Elsa K Magnums" of Dr. Lauren Kortz, proprietor of Elko Arms, 28 rue Ecole Moderne, 7400 Soignes, Belgium. Kortz, an Austrian physician, has his double rifles and combination guns made in Ferlach, Austria, and his rimmed cartridges are 3.3 inches in case length for his "super magnums" and 3.25 inches long for his regular Elsa K magnums. Kortz claims his cartridges offer 200 or more feet per second velocity than corresponding factory cartridges such as the .375 H&H Magnum and the .458 Winchester Magnum. Ammunition is being developed and produced in the United States with American cases and components.

With such a variety of calibers and a power range well beyond what is needed for the largest and thickest-skinned dangerous game, American wildcats are at an all-time high level of performance extending to the practical limits of our fine components. It is doubtful if anything more is wanted—or is it? Frankly, I doubt if we have seen the end of the upward spiraling of wildcats. If you or I think nothing more is needed, there is always somebody out there who sees or thinks he sees a yawning gap between the ".493 Improved McMuckett Magnum" and the ".528 Potrzibi" or whatever. Maybe that's why wildcatting is so exciting!



Frank Pachmayr built this custom rifle on a 1917 Enfield action for the monstrous .475 LTD wildcat which had been developed by the author for the late Hans Tanner.

GUNS & AMMO'S OWN BIG BORE WILDCAT INFORMATION

The .460 G&A is a full-length .458 caliber magnum cartridge based on *Guns & Ammo* Publisher Tom Siatos' concept of an optimum .458 caliber magnum using the basic .404 (10.75x73) rimless case. The original .404 shoulder has been moved forward and the body taper reduced for maximum powder capacity. The 2.800-inch length of the .460 G&A case requires a magnum-length action such as the magnum Mauser, Brevex, modified U.S. 1917 Remington or Winchester action (not Eddystone), British Pattern '14 or other suitable action of magnum length. Most bolt faces for the H&H belted rounds will accept the .537-inch .404 rim diameter, which is only .005-inch larger in diameter than the .532-inch H&H belted case rim diameter without alteration. Dies can be obtained from Huntington Die Specialty Co., P.O. Box 991, 601 Oro Dam Blvd., Oroville CA 95965. Boxer primer pocket basic brass can be obtained from Brass Extrusion Laboratories, Ltd. (B.E.L.L.), 800 W. Maple Lane, Bensenville, IL 60106. This is listed as their ".404 Jeffrey Base." Boxer primer pocket cases for the .404 (10.75x73) are available from Dynamit Nobel of America, Inc., 105 Stonehurst Court, Northvale, NJ 07647. It is much easier to make cases from cylindrical brass than from .404 cases, since only one pass through the full-length sizer is needed. With .404 brass, the case must be neck-expanded to cylindrical form and then necked down so as to create the correct shoulder position.

We recommend Federal 215 or other magnum primers. Our working loads as proven in Africa by trophy hunters of elephant, game rangers for control work and professional hunters use 500-grain Hornady steel-jacketed solids and Hornady 500-grain soft noses. Winchester components are no longer available. For the soft-nosed load we use 90 grains of IMR 4064 and for the solid load we use 88 grains of IMR 4064, for a velocity of 2,350 fps and 6,000 ft. lbs. energy in our rifles with 24-inch barrels. This results in a full case of powder and optimum velocity. At such a velocity one must be careful on broadside shots at buffalo and elephant if in herds since complete penetration and exiting can and often does result. We have found this load to be perfectly balanced for the cartridge and superbly accurate, and we recommend no other. The reason for the two-grain difference between the load for the 500-grain soft nose and the 500-grain solid is that the solid bullet extends some .090-inch deeper into the case behind the crimping cannelure, reducing powder space. A two-grains-less load (88 grains) for the solid, compared to 90 grains for the soft nose, compensates for the variance in loading density. We recommend that your dies be ordered with crimping shoulder and that hunting loads always be crimped firmly to retain bullets securely in their cases when in the magazine.

The .450 G&A Short Magnum is also based on the .404 (10.75x73) case, but it is a 2½-inch case cartridge designed as a replacement for the .458 Winchester Magnum and to clean up the .458 Winchester chamber. It uses the original magazine, with minimal or no modification, and the original bolt face.

We obtained the following velocities with a 22-inch barreled Winchester Model 70 rechambered from .458 to .450 G&A Short Magnum using 500-grain Hornady solids in all loads:

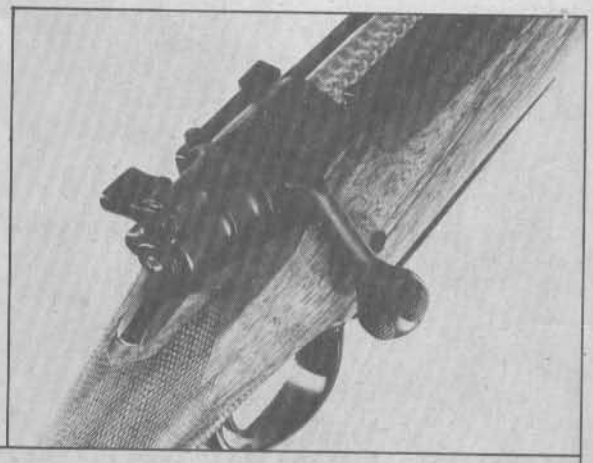
78 grains IMR 4895	2,160 fps
80 grains IMR 4320	2,200 fps
80 grains IMR 4895	2,160 fps
82 grains IMR 4320	2,200 fps

These loads showed no pressure problems in our test rifle. With a 24-inch barrel, velocities would increase around 40 fps. Doubtless more velocity can be obtained with other loads, but these loads chronographed over 200 fps more than obtained with factory .458 loads and the same barrel length.

CHAPTER 12

Whether it's something as simple as sights or added stock reinforcement, or a full-house custom job, the rifle for dangerous game is especially deserving of . . .

THAT "SPECIAL TOUCH"



Even in these hard times, demand for custom rifles is at an all-time high—as is the quality of rifle amongst the better U.S. custom makers. The epitome of gunmaking used to be a rifle like the Holland .375 below, but today U.S. guns like George Hoenig's .416, above, and David Miller's .404, right, can compete with any rifle made anywhere, any time.

Custom big bores were once the only big bores with the exception of Winchester's Model 70 in .375 H&H Magnum, arriving in 1937. Anything of more or equal power meant a British, American or European custom rifle, and in prewar and early postwar days, the possession of a .404, .416 Rigby or .505 Gibbs, for example, was the mark of a well-to-do chap. The availability of big bore production rifles has ensured that big game hunters of ordinary means have access to the most efficient, humane stopping power. However, this hasn't reduced demand for custom big bores, but has actually increased it by making the ammo available almost anywhere, and by increasing the interest in such calibers. I have used both production and custom big bores in my hunting and range testing, but never one for hunting "out of the box." You don't need a custom big bore, but if you use a production big bore you should see that it functions as reliably as a good custom job and that it is as rugged. I do not consider that custom quality means aesthetics or "snob appeal" on the big bore, but rather it should mean the basic strength and dependability inherently required.

Anybody with a modicum of mechanical skills can, with readily obtainable home gunsmithing materials and simple household tools, bring most production big bores up to a Spartan state of field ruggedness and reliability. I have done it many times and so can you. Call it "customizing" or whatever, the same qualities that for a century have served the professional hunter in handmade rifles are simply functional ones. You owe it to yourself, and the game hunted, to see that the rifle you use for large and sometimes dangerous game—custom or production—is fit for its tasks.

Epoxy bedding, all-steel sights, jam-proofing the action and sometimes stock reshaping are normal post-purchase chores for me. Once such things are done, there is plenty of range testing to expose any rifle or load problems *before* the hunt. Given a good and proven basic action, barrel and stock, such refurbishing will usually bring the production rifle to a functional level on a par with that of the best custom article, and at negligible cost. It is the big bore's vital role as a potential life saver—your own, or a companion's—that makes the difference worthwhile.

Most sportsmen who hunt with professional guidance are quite safe because they are backed up, even if they don't shoot as well as they should, or in case their rifle malfunctions, but history shows that it is unwise to rely on this. There are simply too many instances of failure on the part of guides themselves—the same human or rifle failures I just listed—which create accidents. One example—a guide in the Central African Republic had a magazine jam when his .458 soft-nosed bullets refused to feed because the noses were mushroomed from battering with recoil in the magazine. This occurred when a wounded lion charged, and fortunately the client saved both himself and the guide or trackers and gunbearers with a light rifle. This book cannot attempt to deal with all the poten-

tial human hunting errors or rifle malfunctions, but by carefully customizing or debugging your rifle you will avoid most mechanical failures.

If the building of a best big bore custom rifle merely required scaling-up the same features of, say, a .270 deer rifle, almost any "smith" could construct an adequate big bore. But the big bore won't stay in its stock with mediocre inletting adequate for a .270. Scope mounts which are mounted sturdily enough to stay put on a .30-06 with 6-48 screws and no fitting to receiver contours will usually shoot loose or off a .458. Normally, such recoil as that of the .458 requires hand fitting of scope mount bases and then epoxying the base to the receiver, using 8-40 mounting screws and Loc-Titing them in place as well as the scope tube.

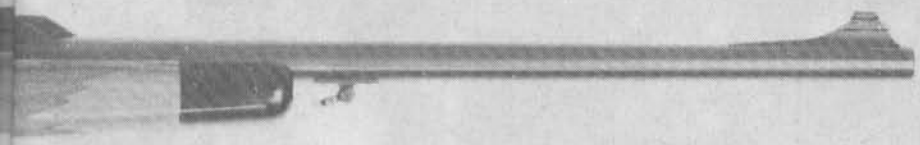
Consider a .458 custom rifle—a "symphony of wood and steel" with a hand-inletted French walnut stock, but with only the receiver recoil lug and a big adjustable trigger which required an unconscionable amount of vital wood removed at the weakest part of the stock. I was given that rifle to test for a top custom maker along with a box of Winchester 510-grain soft-nose ammunition. I asked the owner if the barrel had a second recoil lug and if the receiver lug had been "glass" bedded. He replied that if the stockmaker had done the job properly, the rifle needed only one recoil lug and no epoxy bedding. I warned him that the rifle would split the stock sooner, rather than later, but he smiled serenely, and off to the range I went with the gorgeous .458 custom. By the time I had fired five rounds from the bench the stock showed a split running from the action tang into the grip area. The receiver recoil lug was insufficient to hold the barreled action in place, and it drove rearward, splitting the web behind the lug, then the web behind the magazine and then driving the tang into the grip. This was simply wanton disregard for the vast stresses of hard-recoiling big bores, but the owner was a small bore user, and the inletting and single recoil lug were more than enough for the .30-06s and .270s he was used to.

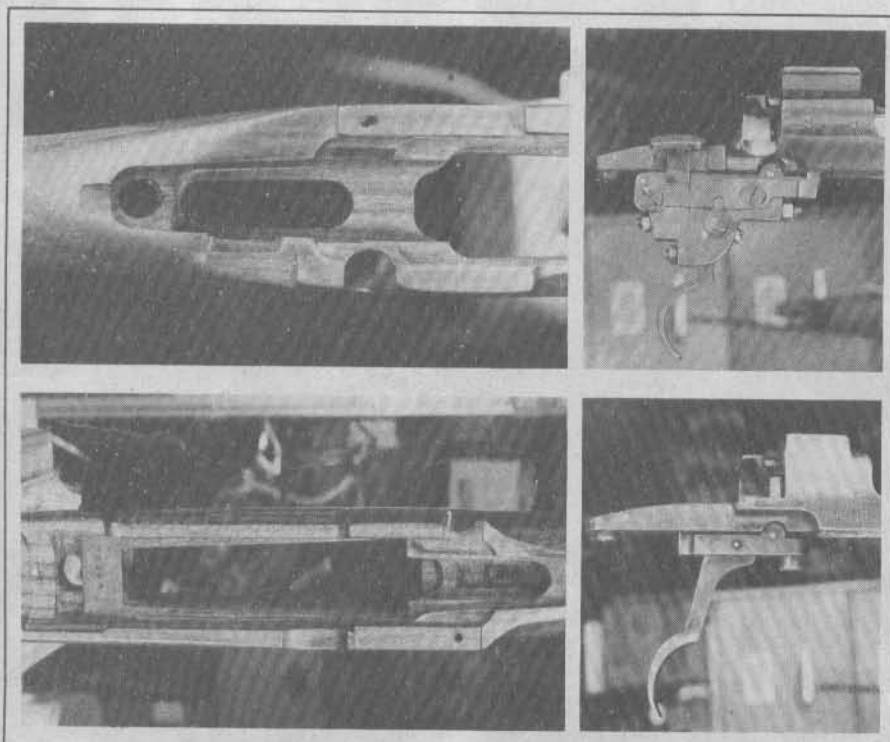
I once bought a customized pre-64 Model 70 in .375 H&H Magnum, and I asked the seller if it fed reliably. He said it had never failed to feed for him, but when I tried to feed 300-grain solids, it jammed every other round. The owner had only used 270-grain semi-spitzers—a much easier round to feed than the bluff-nosed 300-grain solids. I cured the problem after a lot of grinding and polishing and testing with the striker removed from the bolt.

Some big bore stocks lack secondary recoil lugs attached to the barrel, and instead the stock is reinforced against splitting by recoil "through bolts" installed in the stock, normally with one behind the receiver lug and the second through the stock web between the magazine and the trigger. Such stock bolts won't prevent an inadequately inletted or one-recoil-lug stock from letting the barreled action drive back and into the stock with recoil. Such bolts merely act as clamps to reduce the symptoms of stock splitting by holding the stock together. What is required is to absolutely prevent the split from starting, not merely to reduce the extent, once it starts. Two recoil lugs are needed for calibers over .375 Magnum—one for the receiver as is standard, and a secondary lug attached to the barrel. I prefer to make these integral with a barrel band which has an open sight base at its top and to sweat this band on the barrel, ahead of the short fore-end.

I always epoxy-bed both recoil lugs after clearing enough space behind the lugs, and I also leave at least .020-inch clearance behind the receiver tang to preclude wedging and splitting. Stock bolts are useful reinforcements if two recoil lugs are used and both are glass bedded, but the stock bolts should also be glassed in place so no clearance exists surrounding them. Personally, I avoid externally visible stock recoil bolts and prefer to chisel out an ample area inside the stock to hold lateral bolts which I make from ¼-inch threaded stock or machine bolts. I thin the bolt head and attach a nut which I fix in place by squeezing in a vise, then I drop these into their recesses and pour in epoxy bedding compound. This traps them in the wood, making them a part of the stock and strongly reinforcing it behind the receiver lug. I also add one to the web between the magazine and the trigger, making two in all, and which are invisible from the outside and do not rust or break the surface of a fine stock.

One of the worst problems with big bore bolt actions is the casual weakening of the stock at its weakest point by excessive machining out of wood around those huge adjustable triggers. This is not much of a problem with deer calibers, but it is a serious matter for a big bore. For this reason and for mechanical ruggedness, I stay with military triggers, reworking them into four to 4½-pound single-stage triggers. These require only minimal stock clearance and are heat-treated forgings with but three parts—the sear, trigger lever and a coil spring. But if you use an adjustable accessory trigger, use the least bulky ones and insist that your stocker remove only whatever wood is needed to adequately clear it. The second weak spot is at the stock sidewalls around the magazine and the thin walls of the magazine box. The sidewalls of





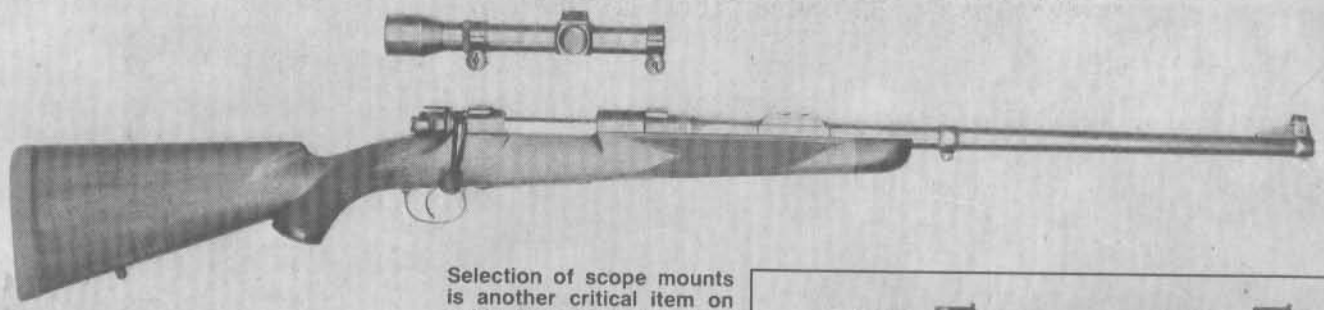
Little details that are largely a matter of personal preference can become critical under the violent recoil of the big bores. Such a matter is selection of trigger, and you'll only have control over this if you're going for a complete custom job. Modern adjustable triggers like the one top right are nice, but are bulky and require removal of much wood in a critical stress area for inletting. The simple old military-style trigger, above, leaves more wood where you need it.

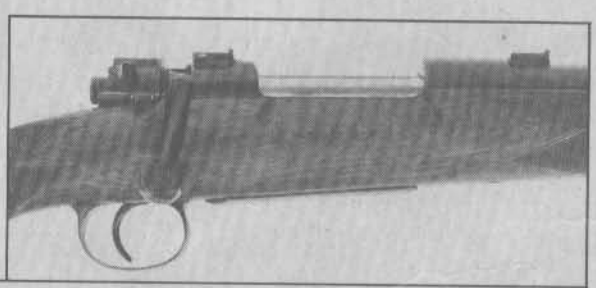
THAT "SPECIAL TOUCH"

the magazine box are often merely thin sheet steel liners, but even if it is a milled steel box, it has thin sidewalls, and frequently the inletting for the box has clearance all around its internal surfaces. Especially on a hard-recoiling big bore, when fired, the recoil lugs transfer the thrust against their contact surfaces of the stock and are prevented by these abutments from driving back and into the stock. From recoil lugs to the stock, the thrust of recoil is finally stopped or met by the shoulder. In many instances the stock's sidewalls around the magazine box and the sidewalls of the box itself are not rigid enough to resist or to transfer this recoil thrust without bending outwards. This results in an "accordioning" of this area which springs outwards in a bowing action, then springs back after recoil. By springing outwards and bowing, this spreads the web behind the receiver lug, between the magazine and trigger and often behind the tang. It also shortens the inletted area for the receiver and magazine when it "accordions," which can use up the clearance behind the tang. It is this spreading of the stock at this flexible point which, more than rearward movement, splits the stock webs and grip area. The way to proof the stock against this weakness is to have the stockmaker dimension the stock sidewalls around the magazine to give as much rigidity as is commensurate with pleasing proportions and to have a minimal inletting clearance around the magazine and no binding. Use the epoxied-in recoil bolts mentioned, internal or external, plus .015 to .020-inch clearance behind the receiver tang and use two recoil lugs—one will be integral with the receiver, the second added to the barrel for the forearm. Epoxy bed both recoil lugs solidly, and if you did the other things along with this, your stock will withstand heavy recoil without splitting. But don't forget to keep guard screws tightened with a properly fitting screwdriver.

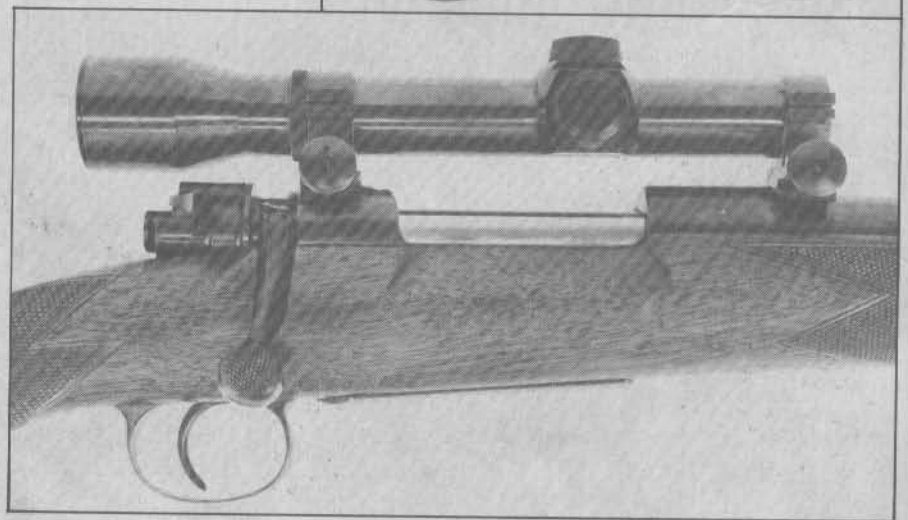
If your gunsmith understands such problems of recoil and knows how to build reliable feeding into your big bore, then let him go ahead with the project, providing he is also a top-class stockmaker and uses dense wood, preferably European thin-shelled walnut with the grain running in line with the grip and magazine sidewalls—the weakest stock areas. Tell him that on rifles with over .375 H&H Magnum recoil, there *must* be two recoil lugs, and that both must be epoxy-bedded, along with ample clearance for the tang, plus epoxied-in stock bolts and minimal clearance around the magazine and trigger. Make sure the floorplate doesn't open with recoil by range testing with full loads. I have rarely found this to be a problem of inadequate overlapping of the catch, but rather, invariably a weak coil catch spring, which I cure by going to a much heavier spring. I have never found it necessary to resort to pinning or otherwise permanently closing a hinged floorplate. Another important detail is to replace any die-cast aluminum alloy magazine/floorplate guard assembly with a steel one. The reason is that Dural (aluminum alloy) has but one advantage—lightness, which won't be needed on a big bore. Dural is also weaker and softer than steel, and bullet noses, especially on steel solids, tend to dent the front wall of magazines when soft, thin or with clearance between the wall and the wood directly ahead. Once the dents get deep enough to catch the bullet noses, it can prevent the round from rising in the magazine. I have also seen a .458 put out of action when being held in the bed of a safari vehicle by a gunbearer. The Toyota hit a rut, the rifle in the gunbearer's hand was slammed down against the bed's steel bed sidewall top and the soft Dural trigger guard collapsed. Fortunately, the rifle, though loaded, was on safe, which held, but the trigger could not be used and our hero finished his hunt with a rented rifle. Such aluminum alloy magazine and guard assemblies can be replaced by obtaining a steel one by Blackburn, H.L. "Pete" Grisel, Don Allen, Herman Waldron and others. Some are guard and floorplate assemblies with no box, but others feature an entire magazine box, floorplate and guard, depending on the rifle's design.

The action is the heart of the rifle, and there is a wide range of action options for the custom big bore, mostly bolt action, but also single shots. We can discuss these latter in a separate chapter. The Mauser Model 98 is the basic and classic bolt action, along with its variants such as the pre-64 Model 70, the Springfield 1903 and the Model 1917 U.S. Enfield or its British counterpart, the Enfield Pattern 14. If you are having built a .30-06-length short magnum such as the 2½-inch case .458 or .338, you have a great variety of action options. If you want a big bore for the .375 H&H





Selection of scope mounts is another critical item on a big bore. They must be quite sturdy, yet a detachable feature is often desired so iron sights can be employed in dense cover. The author made this .458 Mauser with customized Sako mounts which can be detached and return to zero.



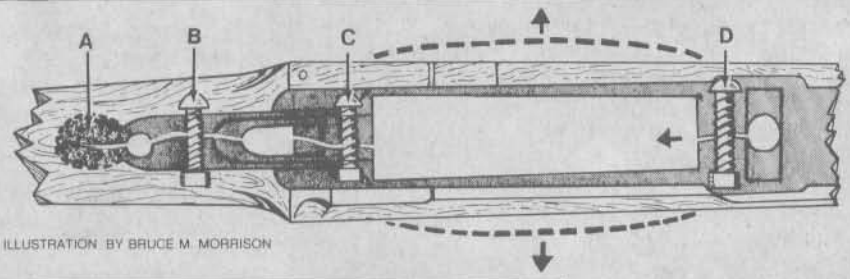
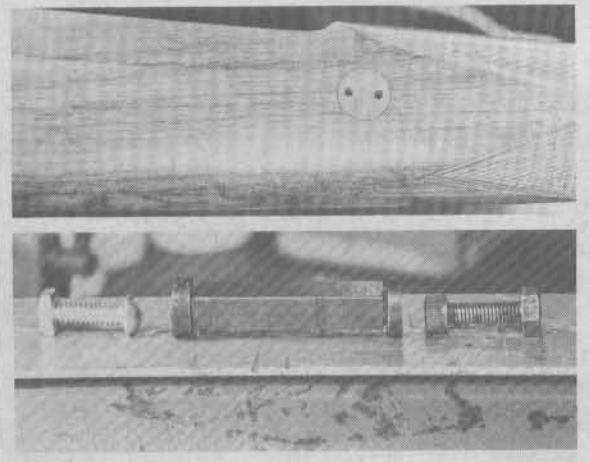


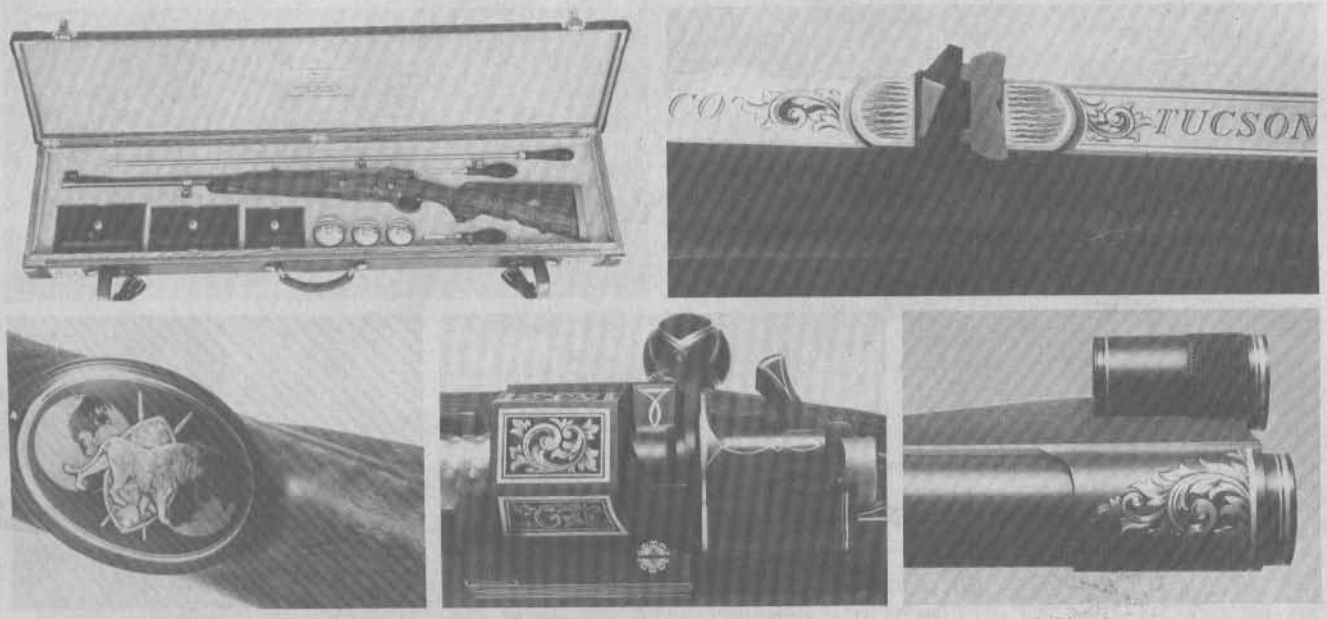
ILLUSTRATION BY BRUCE M. MORRISON



Proper stock reinforcement to withstand big bore recoil is extremely important, as is the selection of the wood. Left, center, is a typical Mauser "through" recoil bolt, while bottom left is the same bolt, removed, flanked by homemade bolts for internal placement behind recoil lug and between trigger and magazine for repairs or added reinforcement. Top, the arrows show directions of stress, while A-D show placement of bolts and epoxy to prevent/repair cracks.

magnum length or short magnum actions. The same holds true for Dubiel, Shilen and others. Probably it is always a good practice to deal directly with the barreled action maker when their custom facilities are available.

Basically, the Mauser 98 design is the most popular action for the custom big bore because it has proven itself over more than 80 years of the hardest service in military and sporting rifles. It was and is the preferred action for the British bolt action big bores for professional hunters and game rangers or elephant control staffs. That's about as fine a recommendation as you'll get. The Mauser 98 system has a non-rotating extractor which doesn't shave particles of brass off the case rim. It has greater purchase area, and because it is ahead of the bolt face the cartridge case's head extends from the chamber only .105-inch—less than with any other type of bolt action. This is entirely within the solid head, therefore not forming a weak unsupported area. The 98's internal receiver ring collar provides enormous strength at the case head, and should any gas escape from the head, the large gas venting holes on the bolt's left side, near the breech, vent the



In 1981, Safari Club International commissioned a series of five custom rifles commemorating the African Big Five, one to be auctioned each year for five years with proceeds going to international conservation efforts. The first, built by the David Miller Company, is on an elephant theme and is a .458 based on a 1909 Argentine Mauser action. The rifle sold for the highest price ever paid for a magazine rifle, and was a bargain at that. Investing some 3,500 man-hours of labor, gunsmith David Miller, engraver Lynton McKenzie and stockmaker Curt Crum built a rifle that's a tribute to U.S. gunmaking.

Magnum, .404, .416, .378 Weatherby Magnum or the .460 Weatherby Magnum, your action options are limited. If you want a .378 or .460 Weatherby, we recommend dealing directly with Weatherby, who produces the rifles and who has the experience and facilities to produce a custom Weatherby big bore on the Mark V action. There is no reason, however, why such calibers cannot be chambered in a custom rifle on another suitable action if desired. Aside from variations of the Mauser Model 98, the pre-64 Model 70 is the most popular action for the American custom big bore, especially in the vastly popular .375 H&H Magnum, the .338 Winchester Magnum and the .458 Winchester Magnum. Many will prefer to obtain their custom big bore directly from the maker of the barreled action, such as a Remington custom Model 700 in 8 mm Remington Magnum, .375 Magnum or .458. Winchester also has a custom department, and Champlin builds complete custom big bores on their own

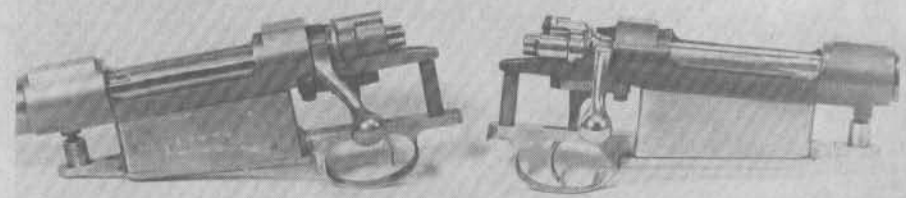
gas. Any gas at the right of the bolt is vented out the ejection port. Any gas which goes beyond the left side gas vents is vented out the left receiver wall's thumb slot. Should any gas travel through the firing pin hole it is met by the firing pin's gas flange, and if gas goes beyond this it is deflected laterally by the bolt sleeve flange. The Mauser 98 has unquestionably the best gas control features of any bolt action.

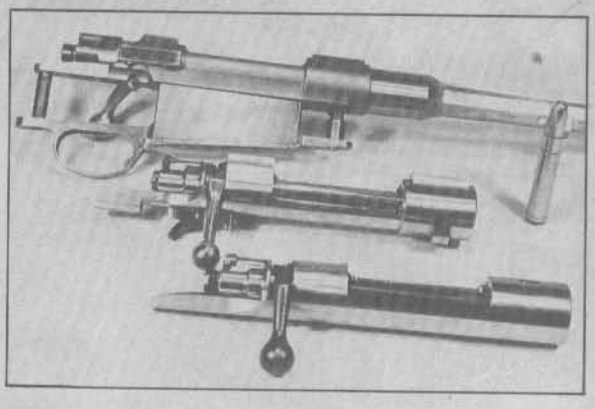
Another reason for the Mauser's prestige is the balanced extraction camming ac-

tion which operates with an 8.5 to one leverage ratio. Disassembly without tools is another important feature, a military one which aids the hunter whose rifle has fallen in mud, dirt, sand or water. It is also easy to replace a broken firing pin in a matter of one minute or less. It is hands-down the preferred bolt action of custom gunmakers here and in England or Europe and still preferred by the African professional hunter who uses bolt actions.

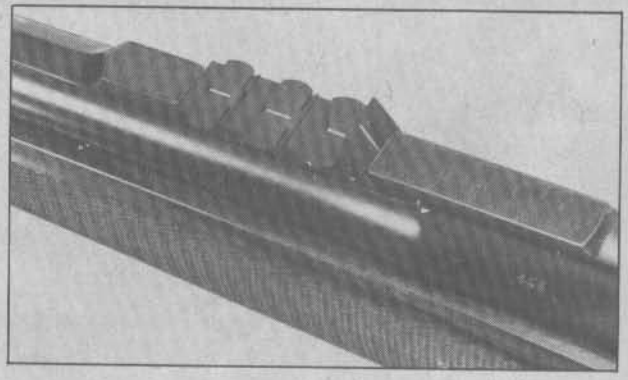
Since .375 Magnum and .416-length Mauser actions such as the original Magnum Mauser are rarities and the French-made Brevex Magnum Mauser action is no longer made, some gunsmiths are continuing to modify Model 1917 or Pattern 14 Enfield actions to accept the long magnums and big rimless British or wildcat heavies. This is not a new idea since these are true magnum actions, which make fine sporting actions when skillfully sporterized. This involves milling off the rear sight "ears," converting to cock on opening and replacement of the issue "dog's crippled hind leg" bolt handle. In fact, Holland & Holland made many of their .375 H&H Magnums on this (Pattern 14) Enfield action. California gunsmith and African hunter-photographer Gil Van Horn prefers his personally sporterized 1917 Enfield actions to original magnum Mauser or Brevex actions because he can control the result. I must say that I agree, if the smith posesses Gil's skill and understanding of what must be done. Gil makes up four or five-round drop magazines for these actions like those on the magnum Mauser or Brevex. I hunted Malawi and Rhodesia from 1962 through 1963 with a Jaeger .458 custom on a 1917 Remington Enfield action with no complaints. I built a custom .460 G&A on a Pattern 14 Enfield action which I modified and had George Hoenig of Boise, Idaho make the stock. That rifle is the backup rifle a top guide uses in the Central African Republic.

By far the most common form of Mauser action on big bores is a good quality military action such as the Model 1909 Argentine D.W.M., an Oberndorf "byf" code WWII Model 98 made at the Mauser Werke, a Czech Zbrojovka Brno Vz 24, etc. With a good finish and heat treatment to begin with, such actions can be sporterized by opening up bolt faces if needed and installing magnum drop magazines as made by H.L. "Pete" Grisel or the London Guns unfinished drop magazines. Sporter bolt handles can be Heli-arc welded on an bolt stops and feed ramps cut back to clear up to .375 H&H Magnum length cartridges. Such opening up of standard length actions is not risky nor, if done right, does it leave inadequate reinforcing mass behind the lower locking lug at the feed ramp. Such allegations of weakness and claims of resulting "setback" of the lug recesses are false. Any setback of the locking lug recess surfaces is due to one or both of these things—inadequate hardness and/or uneven locking lug contact with matching lug recess surfaces. The latter can be remedied by lapping the lugs in, and inadequate hardness can be cured by reheat-treatment. However, this business of "soft actions" as applied to Mauser 98 type actions is usually based on ignorance of Mauser heat treatment. Most complaints on this score involve external Rockwell hardness testing on the underside of the receiver ring, the top of the ring and only rarely involving the bolt lugs, which usually Rockwell quite hard. Mauser heat treatment consisted of applying a carburizing paste to the receiver rails, raceways and *inside* the lug recesses, not to the outside of the receiver ring. The bolt body and locking lugs are invariably glass-hard on the outside, and all carburized surfaces are hard for a greater depth than that of cyanide dip case hardening. Inside this surface "shell" or high carbon hardness, the core remains tough to resist shock. Pre-64 Model 70 actions, on the other hand, are of chrome molybdenum alloy steel and uniformly heat treated to a tough semi-hardness, but current Model 70 receivers are heat treated only where needed by function. One difficulty in hardness testing any carburized surface-hardened area of Mauser actions is that this hard "shell" can compromise or render inaccurate such a reading because below it the steel is soft. What occurs is that under the





Full-length magnum Mauser actions are mighty scarce these days, but Fred Wells' custom shop in Prescott, Arizona, is turning out actions long and massive enough for even the biggest wildcats. Wells' actions are expensive, and delivery time can be quite long, but they're beautifully made. Wells' shop also makes barrels, and their own wildcat line includes the mighty .510 Wells.



Paul Jaeger, Inc. in Jenkintown, Pennsylvania is one of America's top-flight custom smiths. This classic-stocked .458 is on a pre-'64 Model 70 action, still one of the favorite actions for custom work. The quarter rib with express sights is attractive and functional on a big bore, but requires much work and cost.

pressure of the Rockwell stylus, this "shell" gives, because of the softness of the inner core, thereby giving a misleading and erroneous reading. I do not advocate the reheat-treating of any action, but advise that any action suspected of being inadequately hardened be replaced. This eliminates heat cracks from quenching, and remember, unless the composition or precise type of steel is known, any heat treatment is based on guesswork. Usually a reliable outfit will do it right, but one is usually dealing with an unknown quantity and the most prudent course is to avoid such actions. I test Mauser actions by trying to get a glass-hard Swiss needle file to scratch or dig into the steel of the lug recess and the raceways, and I run a file over the bolt locking lugs. If the file glances off, I know the surface is hard. I then check out the locking lug bearing surfaces for any setback. If it exists it will show where the lug or lugs indented their bearing surfaces of the lug recesses. Usually setback involves but a single lug, the result of uneven bearing, the remedy for which is lapping-in or another action.

Enfield Model 1917 actions are made of nickel steel and are normally hardened throughout. Some can be too hard, and 1917 Enfields and Pattern 14s should be Rockwelled. A "C" scale Rockwell reading from 35 to 40 is about right, but more than 40C is too hard and in the direction of brittleness. Avoid 1917 U.S. Enfields made by Eddystone which have a reputation for brittleness, and it is best to stay with 1917 actions made by Remington or Winchester. For the massive .505 Gibbs cartridge, a Pattern 14 (British) action or a Pattern 14 bolt in a U.S. 1917 action should be used because there is more steel at the bolt face for leaving a rim after the face is opened up for the great .505 rim.

Whether your big bore is factory or custom, your life may depend on its smooth, reliable functioning! Even the best rifles may require a little polishing on the feed ramp for added smoothness. This Browning was rebarreled from .264 to .458, requiring ramp modification, left, and polishing with an emery cloth.

An interesting design factor with either the 1917 or the Pattern 14 Enfield is that it is a true interrupted thread action, with the bolt lug locking surfaces and their lug recess surfaces cut on a true helix or thread angle of four degrees. This gives the final locking leverage an incredible ratio of 100 to one! This makes sure that the tightest fitting round will be chambered. The extraction cams are like those of the Springfield 1903, a helix inside the bridge and a bolt root cam to match. The cartridge seating cam has a lead with a powerful initial 12 to one ratio.

Commercial Mauser actions are still being made, including the Interarms Mark X, in both standard (.30-06 size), short belted magnum size and .375 H&H Magnum size with magazine to match. The Spanish Santa Barbara 98-style commercial action as used on Parker Hale sporters is also available, and both it and the Yugoslavian Zastava (Mark X) action are made on machinery originally set up by the Mauser Werke for producing military Mausers in Spain and Yugoslavia under license. Original commercial Mauser, Oberndorf standard length actions turn up from time to time as do original magnum Mauser actions and Brevex magnum actions, the former usually on shot-out rifles, but sometimes they turn up in original unbarreled condition.

Tang safeties are unsuited to heavy recoiling calibers because they can inflict abrasions on the grip hand thumb or web.

The standing wide "V" express rear sight, often coupled with folding leaves for longer ranges, is the classic open sight for a big bore. However, such sights are normally non-adjustable for rigidity. When such is the case, the only way to sight in the rifle is to painstakingly group the rifle and hand-file the sight into zero. Inset, always spend time on the range testing for dependability, even with a fine custom-made gun.

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They also require too much wood removal at the grip, the weakest stock area along with the magazine area.

How do properly sporterized military Mauser and Enfield actions stack up to suitable commercial actions? It depends on the skills of the gunsmith, but 1917 and Pattern 14 Enfield actions are stiffer than Mausers with thumb slots because of their solid left sidewall, and before sporterization these Enfields are ½-inch longer than the Mauser 98—a true magnum action. If iron sights only are used, the original 180 degree Mauser "wing" safety works fine and enables quick takedown of the bolt. It is also very unlikely to be accidentally released. The Model 70-type bolt sleeve safeties for Model 98 Mausers as made by "Pete" Grisel, Don Allen, Herman Waldron and others are best for scope sighted Mausers, unless they are F.N., Santa Barbara or Mark X commercial actions with side safeties. Some are two-position but others are like the Model 70, three-position, with a middle position which permits working the action while on safe plus a locked bolt safe position. Personally, I won't use a safety which has no bolt locking position, since I don't want it to open either when in a gunbearer's hands or my own.

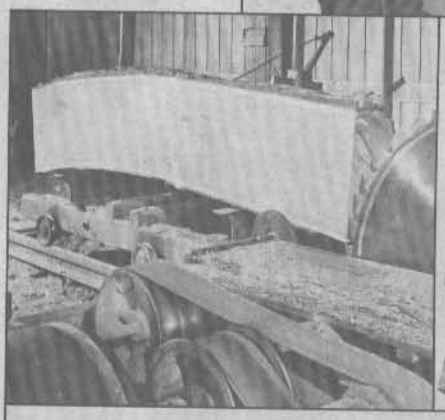
The Model 1917 and Pattern 14 Enfield actions, the 1903 Springfield, the pre-64 Model 70 and the Brno ZKK actions are all variations of the Mauser. Aside from its non-rotating extractor, perhaps that most significant common characteristic of all these Mauser and Mauser-type actions is that they fully control the chambering and extraction of the cartridge. Only with this system does the extractor engage the case rim as the round is pushed up under it when the bolt is driven forward. In other types of bolt actions with recessed bolt faces and snap-on extractors, the cartridge is merely bumped or pushed into the chamber. With a Mauser system you can run the whole magazine load through the chamber without turning the bolt lever down into battery, simply by working it back and forth with handle upraised. No double-loading can occur because any cartridge chambered, even when the bolt handle has not been drawn down and into battery, can be extracted, but with recessed bolt face extractors the round will stay chambered, because such snap-on extractors don't engage the rim unless the bolt is fully in battery. This can have practical advantages as when one wants to remove a top magazine round with an undesired bullet type such as when a soft nose or a solid is the top magazine round, but the hunter decides that he needs a different bullet style. With the Mauser system an unwanted solid or soft nose can be worked from the magazine and a different round chambered after the unwanted round is removed. Should one chamber a round with a non-Mauser type action and not bring the bolt down and into battery and then try to withdraw that round by error or by intent, the subsequent round from the magazine will jam against the chambered round, but this will not occur with a Mauser-type extractor.

The main requirements of the big bore action are reliable chambering and extraction. With cartridge brass stronger and more elastic than ever and with progressive-burning powders, excessive pressures are not the cause of action problems other than in rare cases, especially with big bores and their typical moderate pressures.

Sako barreled actions are also available for builders of .375 H&H or .338 magnums. One advantage of the Sako action is its Mauser-type ejector instead of the plunger type which leaves a hole in the bolt face where in some cases the case head will flow slightly, causing extraction difficulty. With such ejectors, a blown primer or case head can drive the plunger ejector into its blind hole and freeze it down, making removal almost impossible. Another problem with such plunger ejectors is that extraction and ejection cannot be controlled as with the Mauser, so as to withdraw the

Henry Pohl of E.C. Bishop & Sons in Warsaw, Missouri positions a great walnut log on the sawmill. Trees that will make fine stocks are scarce and valuable.

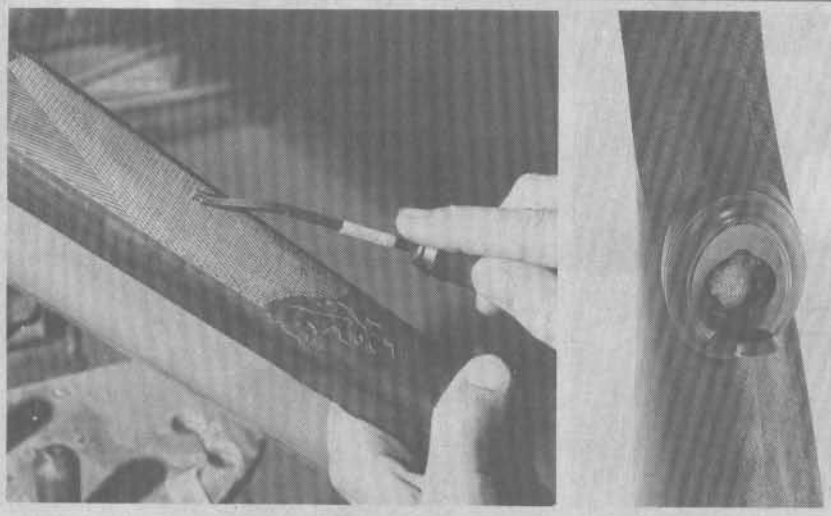
The heart of a custom rifle is its action, but its soul is the wood that's selected for its stock! Wood for a big bore should be fairly straight in grain, particularly in the high stress areas, and it should be dense and hard. European walnuts such as French, English and California-grown Bastogne are good. Right, Frank Pachmayr, a great name in gunstocks and custom rifles, grades gunstock blanks. His company is one of the nation's leading suppliers of excellent stock wood.



It takes much time and careful work to take a walnut log from the sawmill to a stock blank to a fine finished riflestock like this Pachmayr classic for a Model 70 in .375.

case silently with no ejection, to be caught in the palm.

Today is the best time of all for the left-handed shooter with so many left-hand actions available, including the Remington 700, Dubiel and Weatherby Mark V. Fred Wells of Prescott, Arizona will make you a left-handed custom Mauser magnum action if desired, including an integral Griffin & Howe type scope mount base milled from the receiver sidewall steel. Wells uses chrome-moly steel and makes commercial-type Mauser replica actions of prewar type, but with low bolt profiles to clear scopes and with solid receiver sidewalls and double-flat tops if desired. Wells' actions are, of course, expensive, beginning at around $2,000 and complete rifles at $5,000, but if you have the price and the patience to wait out the two to three-year lag time, Wells' products are worth waiting for.



A custom rifle can be fairly plain, or it can have all the embellishment and "extra touches" the buyer's taste and pocketbook can handle. Good checkering, with or without carving, is usually present; a trap grip cap is distinctive and unusual.

Stock design for the big bore is the subject of much travail and strife, to say nothing of sleepless nights of agonizing over styling. By nature the big bore stock requires that heavy recoil and its effects be considered in all stock details and dimensions. Generally speaking, the big bore stock should have a nearly straight comb and one that isn't sharp to avoid cutting into the cheekbone, a wide and deep butt area, a laid-back pistol grip to preclude slamming the forefinger into the trigger guard and a short but ample forearm. The latter combines with a barrel band forward sling stud which cannot slam into the forward hand and which lets the slung rifle sit low enough to avoid catching the muzzle in vegetation. Some like the Keith-type Monte Carlo with its forward downhill sloping comb angle, which during recoil slips away from the cheek. The Monte Carlo design also has plenty of drop at the heel which naturally forces the muzzle upwards sharply in recoil. I want to retain four-point contact with the stock during recoil—cheek, shoulder, grip and forearm—so as to have a quick recovery from recoil and to tame recoil as much as possible. If I use a cheekpiece it is of the European "egg" type, and I use an oval or pear-shaped forearm about like that on the Winchester Model 70 "African" .458.

Thin-shelled European type walnut such as French, English, Yugoslavian, Turkish, Pakistani, or the mostly California-grown English, French or the hard and tough Bastogne are the premium woods for heavy recoiling magnums. There are a large number of fine stockmakers who can make custom big bore stocks, such as George Hoenig of Boise, Idaho; Jerry Fisher of Kalispell, Montana; David Miller of Tucson, Arizona; Bill Dowtin of Celina, Texas; Pachmayr Gun Works in Los Angeles; Al Biesen of Spokane, Washington; Joe Balickie of Apex, North Carolina; Don Allen of Northfield, Minnesota; Maurice Ottmar, Coulee City, Washington; Keith Stegall of Gunnison, Colorado; Phillip Pilkington, Enid, Oklahoma and more.

Big bore hardware is now available from a coterie of talented metalsmiths, including custom bolt handles for heli-arc welding to replace military bolt handles, such as those offered by "Pete" Grisel, Lenard Brownell, Herman Waldron and others. Barrel band sling studs are made in various inside diameters by George Hoenig, "Pete" Grisel and London Guns. Quarter ribs for express sights and as scope mount bases are available from "Pete" Grisel, Lenard Brownell, who makes them for his custom quick detachable mount bases and Ralph L. Carter (with scope mounting cuts machined integrally and quarter ribs machined integral with octagonal ribbed barrels). Jay Frazier and Griffin & Howe can furnish quarter ribs, the latter with G&H top mount bases if desired.

Steel grip caps, trapped and plain, are made by George Hoenig. Al Biesen also makes steel grip caps including the skeleton type as does "Pete" Grisel, including engraved caps on special quotes. Jerry Fisher and Lenard Brownell also make fine steel grip caps.

Mauser type trigger guards for pre-64 Model 70s are made by Don Allen with commercial style, inside guard button release. Herman Waldron makes commercial Mauser type steel guards and hinged floorplates for a variety of actions; Dick Willis furnishes custom Mauser commercial type

Roy E. Weatherby Sr. of Weatherby, Inc. examines a fine custom .460 Weatherby on his Mark V action. The distinctive "Weatherby look" is one of the most-copied designs around, and Weatherby's custom shop does brisk business in upgraded Mark Vs.

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steel guards and hinged floorplates for the Model 70, Remington Model 700 and the Weatherby Mark V.

H.L. "Pete" Grisel makes steel Mauser type magazines for pre-64 Model 70s, 98 Mausers and "rail type" guards and floorplates for Remington Model 700 long actions and Model 700 short actions. Grisel also makes four (magnum) round drop magazines for short and long (.375 H&H length) belted magnums. London Guns makes steel investment cast magnum drop magazines for standard length Mausers and for 1917 and Pattern 14 Enfields which must be finished by the user.

British type wide "V" express sights are traditional with big bore rifles for dangerous game and for all close range shooting. London Guns makes a nice set with the standard vertical fixed sight followed by three spring-loaded snap leaves, plus bases for various barrel diameters. George Hoenig makes a fine adjustable express sight, and Interarms can furnish express sights as made for their Whitworth rifle.

Contrary to some views, open express sights or receiver peep sights do combine well with scope sights when mounted suitably. German "tunnel" claw mounts are too high for adequate cheeking of the stock, but a good side mount is better and leaves the top of the receiver clear. If the scope is side mounted to a compromise height, as Griffin & Howe has done for decades, both iron sights and scope are available with but a slight canting of the head. This is by far the fastest route to a near-instant choice of scope or open sights. On my Griffin & Howe .30-06 Springfields with Lyman 48 receiver sights and side-mounted scopes, no detaching of scopes is needed—only a quick and almost imperceptible canting of the head. The cheek never changes its position on the comb so that no support is lost. This is because the head only pivots slightly in order to align the eye with the peep.

Quick detachability is a desirable feature of a scope mount, but in a hunting situation no animal will wait while we remove the scope and fumble for a place to put it. Whatever system is used, it should be a near-instant choice of scope or iron sights with no detaching of the scope. In recent years the use of fixed tunnel mounts in America has increased due to this near-instant choice of scope or open sights, but most production examples are very high. With the "tunnel" mount or a compromise-height side mount such as the Griffin & Howe, no "quick detachability" feature is required.

Fine custom scope mounts are made by George Hoenig, David Miller, London Guns, Fred Wells, Lenard Brownell and Griffin & Howe. Some of these might be more accurately termed semi-custom since, though individually machined and hand finished, they can be bought directly from the maker without sending the rifle. As is usually the case, a scope mount base which is "customized" to fit the individual big bore will withstand recoil better than one merely screwed on as manufactured. Production mounts can and do serve on many big bore rifles of heavy recoil, but 8-40 screws instead of 6-48 should be used and these should be semi-hard Loc-Tited in place. Bases should be scraped in if necessary to fit the receiver contours and epoxied in place. If quick detachability is not required, Redfield, Buehler, Burris, Leupold and other top mounts, bridge or split type, are available. Ruger's steel rings for their integral bases on the Model 77 and the No. 1 single shot are excellent. Pachmayr Gun Works has long made a Lo-Swing pivoting mount which can be quickly rotated to the left for use of open sights.

Custom options such as Lenard Brownell's twin lever quick detachable top mount with the bases integral with his quarter rib are fine. Ralph Carter also makes quarter ribs with integral cuts to take the scope rings, and the Griffin & Howe combined quarter rib and top quick detachable mount has long been a favorite of the big bore user.

Scopes for heavy-recoiling big bores

Some features employed by the best British makers remain in demand with U.S. smiths. The detachable mounts on this Holland .375 can be used with two different scopes.

Each custom smith has his own preferences and style, and part of selecting a maker for your rifle is to make certain that your tastes match his, rather than vice versa. A good gunmaker is an artist, and his best work will be on a rifle styled in a manner that he's comfortable with. These and the rifles on the next page are but a small sampling of the many fine American custom gunsmiths. As can be seen, the general trend amongst custom smiths who make big bores is towards the classic stock.

must not only be mounted solidly to resist recoil, but they must themselves be very strong internally, something not easily achieved with today's self-centering reticules. Long eye relief—3½ to 4½ inches or more—plus stocks with a length of pull as long as is consistent with ease and rapidity of handling will prevent those "cookie cutter" brow collisions common when heavy recoil, minimal eye relief scopes and "stock crawling" combine to do the devil's work! All around calibers like the .338 Winchester Magnum, the 8 mm Remington Magnum and the .375 H&H Magnum can use as high as 4X, but scopes for heavies like the .458 and .416 are preferably 3X or less, even down to 1X. After all, magnification is not the idea of the big game scope. One doesn't have to magnify an elephant, a Cape buffalo or a Kodiak bear, and as Elmer Keith said, "It is disconcerting to look through one's scope and find it filled with hair!" The lower powers also offer more field, are brighter and usually have more eye relief. Most reputable makers offer at least one model suitable for the big bore, and I won't attempt to rate them or make invidious comparisons. Finding the right scope for the big bore can be a trying experience, and my advice is to never go on a hunting trip without an extra scope sight per rifle, preferably sighted in with spare rings attached when possible.

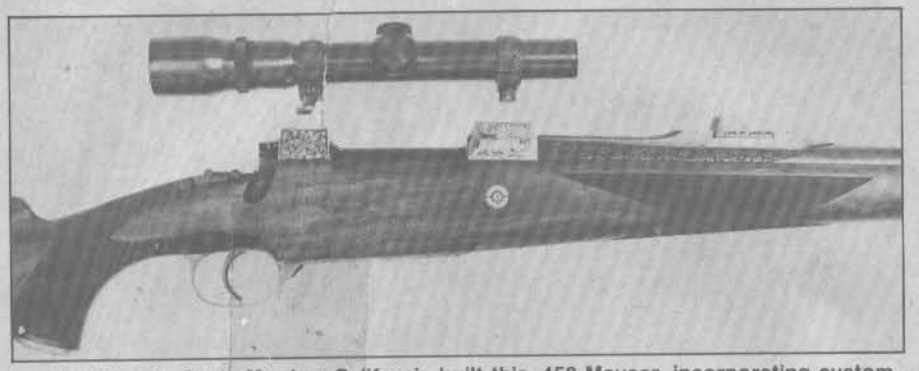
What kind of finish is best for the big bore? Traditionally, the European rust "cold blue" is favored, as on British express rifles, Griffin & Howe and the now-rare Hoffman sporters. It is a harder, more rust and handling-resistant finish than the common caustic, hot or "salt blue" which is much cheaper to apply. Few shops can or will do rust bluing, but there are still some that do or if not they can send it out to a specialist who does. Rust bluing resists rust and handling better than the salt blue because it is a coating left by successive coats of rust which are carded off and the parts boiled, and this process is repeated until the desired color is produced. The caustic or salt blue is a one-trip dip process, and it actually works quite well. To simulate the soft matte finish of the rust blue, some guns shops bead-blast the surfaces to be blued first, then caustic blue as usual. Such a finish looks good, but those familiar with rust bluing can tell the difference. There is also evidence that this type of salt blue tends to rust quicker than if the surface had been highly polished, since the bead-blasted surface contains countless tiny pits which retain perspiration and moisture better than a polished surface.

Parkerizing is a hard-deposited surface used by the military, and some sportsmen prefer it for handling and rust resistance as well as for its non-reflecting nature. Gil Van Horn prefers stainless barrels for his big bores, which he says then require no cleaning during the hunt. He uses Gun-Kote, a dark gray, applied external finish, which works well.

Black chrome plating is best avoided since it is a form of decorative chrome plating which is not bonded directly to the steel but is applied to copper plating. I had a black chrome plated .458 which despite daily wiping down with RIG coated patches and a dry African climate began to reveal small blisters. They were caused by rust pushing up the black chrome plate. I took it to a top plater and asked him what the problem was. He replied that all decorative chrome was very porous and that acids, moisture and salt work under the plating through the minute pores, causing rust. It is impossible to neutralize such under-the-surface corrosion. I had the plater use reverse polarity to strip the insidious stuff off, then had the rifle rust blued. That was 20 years ago but the surface looks almost new today!

Some few gunsmiths can "carry the ball" from A to Z and build the rifle—stock and all—to finish, with only the basic barreled action produced outside. Such men include George Hoenig of Boise, Idaho; Jerry Fisher of Kalispell, Montana; Paul Jaeger of Jenkintown, Pennsylvania; David Miller of Tucson, Arizona and, to be sure, others. Larger shops, such as Champlin, build their own barreled actions, and Griffin & Howe and Pachmayr Gun Works are famous old outfits who can and do build top notch custom big bores.

Fortunately, the big bore options available in the United States cover an amazing variety of designs to suit every personal requirement. But it wasn't so long ago when owning a big bore required affluence, and more often than not the big bore was an import. Given the "backup" and stopping role of big bores, their design and quality is not a subject for superficial scanning. Whatever the stock design, action, sights or caliber, the big bore, more than any other class of rifle, demands Spartan ruggedness and simplicity, recoil-controlling stock design, smooth and malfunction-free actions, rugged open basic sights, and if scopes are used they must be capable of taking heavy recoil and so must their mounts. Aside from such qualities and the other aspects and admonishments I have presented, your big bore is more like lesser caliber rifles than such special requirements seem to indicate.



London Guns in Santa Monica, California built this .458 Mauser, incorporating custom-made detachable scope mounts and quarter-rib with express sights. This rifle also features the distinctive "belly" of a drop magazine—all desirable but costly features.

These custom guns represent a variety of big bore calibers, including Bill Dowtin's .416 Chatfield-Taylor and Gil Van Horn's .460 G&A. Custom makers use a variety of actions, depending on customer's choice and availability. Champlin makes their own action, but the most popular amongst most makers are Mausers and old Model 70s. Van Horn's rifle is on a 117 Enfield action, a massive action. Features common to most of these rifles are express sights, drop magazines, and detachable mounts, if scoped.

CHAPTER 13

HOW TO LICK THAT KICK!

Powerful rifles do *have recoil—that's a fact. But it's also a fact that there are things you can do to lessen its effect!*

Executive Publisher Tom Siatos, left, takes a jolt from the mighty .505 Gibbs. Recoil is a real consideration with the big bores, and it's a fact that some shooters are more susceptible to its effects than others, despite recoil damping devices.

G&A Books Senior Staff Editor Jan Libourel, above, handles a .460 Weatherby, while *HUNTING's* Publisher Ken Elliott, right, shoots a Ruger No. One .458. The Weatherby's recoil is tamed by a muzzle brake, while the Ruger has a Counter-Coil hydraulic device—but both guns still kick!

Recoil and big bores go together like baseballs go with bats. We can't have one without the other. This is true of all firearms in that recoil is simply the reciprocal physical reaction of a firearm to the firing of a cartridge. The late Major General Julian S. Hatcher stated the case quite succinctly in his indispensable book *Hatcher's Notebook* as follows: "Now it seems to me that there is quite a difference between 'recoil' and 'kick.' Recoil is mechanical, while kick, or at least the effect of it, is mostly physical or psychological. The amount of kick resulting from the recoil force applied by the gun is largely dependent on the weight and conformation of the shooter, whether he holds the gun tightly or loosely, the presence or absence of a recoil pad or padded coat, and many other things. The location and shape of the shooter's bones and the texture of his flesh seem to have a big effect in some cases."

Hatcher then went on to describe a fellow Army shooter who always put a folded bath towel inside his shirt to pad his shoulder against recoil from the 1903 Springfield .30-06. This chap was the only man who padded his shoulder and the only one of the group whose shoulder became black, blue and green afterwards. I noted the individual difference among shooters in their tolerance of recoil or "kick" when range firing .375 Magnums preparatory to a Mozambique safari. One fellow hunter, a dentist, always got the most awful discoloration on his shoulder and surrounding tissue after firing his Model 70 .375 H&H Magnum with 300-grain Silvertip factory loads. Despite this, he is a fine shot and overcame the problem, though not its bruising effects. One cannot get something for nothing, and a rifle must recoil in an equal and reciprocal reaction to the energy of the bullet it fires. It is the rifle's weight and area of its butt which prevent it from penetrating our shoulder, which otherwise it would do if it weighed the same as the bullet.

Recoil energy is the popular way to express recoil, or "free recoil," which is the energy developed by the gun itself with nothing to oppose its rearward thrust. In reality this mathematical means of stating recoil is not the same as "kick," which greatly modifies or accentuates the felt force according to stock dimensions and design, such as a recoil pad or not, the area of the butt as well as buttstock drop, height and thickness of comb, etc. Felt recoil is hereafter used synonymously with "kick." The recoil energy of a 12 gauge shotgun with 1¼ ounces of shot is about 32 ft. lbs. or about that of a .375 Magnum rifle. The old "Trapdoor" Springfield .45-70 rifle, at 9.3 pounds, has a free recoil energy of 15 ft. lbs. A .577 three-inch Nitro-Express with its 750-grain bullet at 2,050 fps has about 100 ft. lbs. of free recoil, or about the limit in terms of what a strong and fit man can handle in a rifle weight of under 15 pounds.

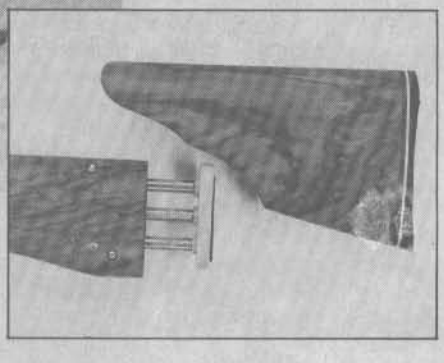
Since recoil energy is proportional to the square of the velocity, doubling the velocity quadruples the recoil energy. It is basic to understanding kick to accept that it is felt more intensely when firing from a braced bench rest position at targets. More often than not, the rifle which punishes us unmercifully at the bench is hardly noticed when fired at game. To test this, try to recall how your 12 gauge shotgun kicked while firing at rising pheasants and then take the same gun to a range and pattern it on a patterning board. Holding a rifle tightly against the shoulder also reduces "kick," since there is no "running start" and the shoulder then rocks back with recoil. The velocity of recoil is a factor which is included in recoil energy but which varies radically between grains of contrasting calibers which have the same recoil energy. For example, take two rifles of contrasting calibers, but with equal recoil energy—one a big bore with slower, heavier bullets and the other a smallbore magnum with smaller but faster bullets. The recoil velocity of the latter will naturally be higher. A recoil

velocity of 15 fps from a 12 gauge shotgun weighing seven pounds is tolerable, but in a 14-p[illegible]d double rifle for the .600 Nitro-[illegible]ch a recoil velocity is intolerable [illegible]an two shots for many shooters. [illegible].er case this is because the ele[illegible]nt rifle has a recoil energy of about four times that of the 12 gauge gun. The unpleasantness of the kick of a higher velocity caliber of two rifles with the same recoil energy has long been noted. I and others have noticed this in the .338 Winchester Magnum as compared with the .375 H&H Magnum, which has a bit more recoil energy. Some of this is attributable to the lighter weight of the typical .338, but higher recoil velocity, as opposed to recoil energy, undoubtedly plays a part. Lower velocity but high energy recoil is more tolerable because it is spread over a longer interval.

How do we control and minimize "kick" so our shooting is not negatively affected? To begin with, some persons are of a temperament which makes them more sensitive to kick, while others are more phlegmatic. This is so because some individuals find rifles of common calibers such as the .30-06 in a nine-pound rifle to kick too hard for them to master. This has long been noted by military small arms training personnel. But leaving such cases out of our discussion, there are many good shots who are more sensitive to kick than others, despite being experienced riflemen and good shots. Such people may find the .375 H&H Magnum to be the maximum recoiling caliber they can handle without flinching. Others can handle a .470 or a .458 but balk at using a .577 double. Much of this is attributable to poor stocking, but not all of it. Whereas it's true that one can reduce "kick" by going to a heavier rifle, this alone is a poor way to tame "kick." A big game rifle has limits as to what is portable and fast-handling in weight and proportions, and to try to reduce kick to acceptable levels by going from a 10-pound .416 to one weighing 12 pounds with no other changes may result only in a slightly less kicking but clublike and unhandy gun.

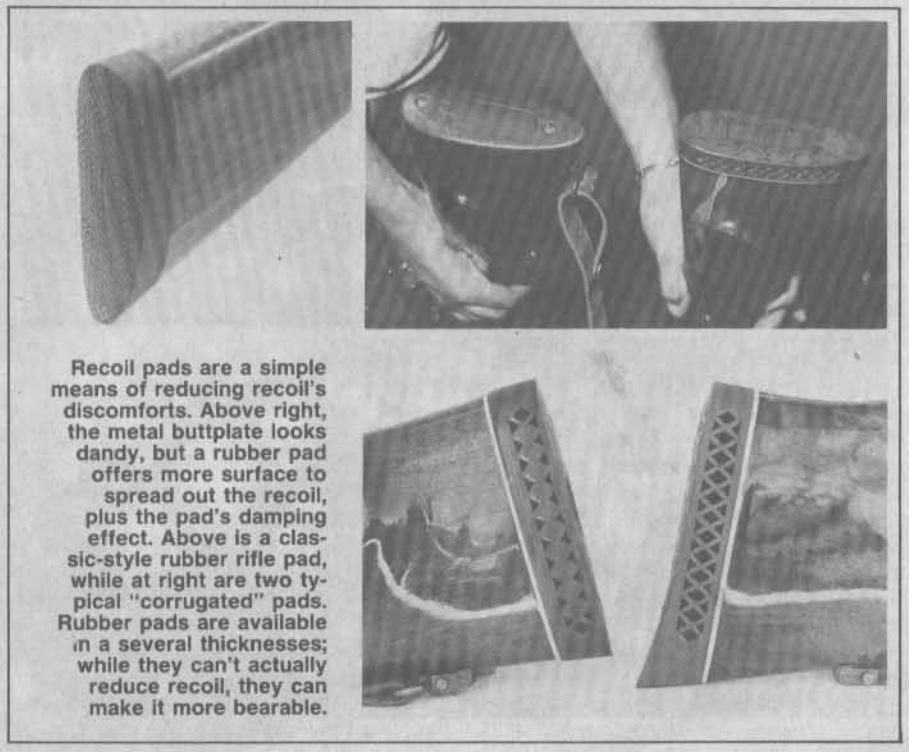
Far better to leave the weight at 10 pounds and to have the muzzle drilled for a Pendleton integral muzzle brake or perhaps a Mag-Na-Port. There are some excellent attachable muzzle brakes, but they lengthen the barrel and often blot out open sights which should always be available on any big bore for emergencies should a scope fail or at close range in close cover on charging dangerous game. Another negative about non-integral muzzle brakes is that a blow can knock them out of alignment, as happened to a friend in Zambia when he swung his Model 70 .375 Magnum and his muzzle brake struck a hardwood tree. Subsequently he noticed his shots were missing, and he recalled the incident with the brake. Looking at the muzzle, he noted where the bullets were slightly glancing off of the same part of his muzzle brake. After clearing the spot with a rat tail file from his guide's tool chest, the problem ceased. The brake became cocked because its threads, like all threads, have working clearance, and with such screwed-on, non-integral attachments, Murphy's law applies—what can go wrong, will!

Muzzle brakes can and do reduce recoil energy. The British experimented with a special 18-pound .50 caliber rifle with 70 ft. lbs. of recoil energy. With a muzzle brake the rifle had only 35 ft. lbs. of recoil energy. Marine Captain Melvin M. Johnson, inventor of the Johnson automatic rifle, developed one of the best muzzle brakes of all, and when tested by the Massachusetts Institute of Technology it was found to reduce recoil by 41 percent. When a major



Two effective recoil devices are the Counter-Coil, and the old Hydro-Coil incorporated into Ed Sowers' stocks, below. Operating via hydraulics, these systems reduce felt recoil; Counter-Coil has been tested to reduce felt recoil by up to 46.5%!

John Wootters taped flashlight bulbs to eyeglass frames and the muzzle and scope of his wildcat .416 Taylor to illustrate the effects of magnum recoil. The recoil of his 400-grain load at about 2,400 fps in this rifle amounts to about 44 foot-pounds. Here Wootters has fired and returned to position after recoil drove him through its arc.



Recoil pads are a simple means of reducing recoil's discomforts. Above right, the metal buttplate looks dandy, but a rubber pad offers more surface to spread out the recoil, plus the pad's damping effect. Above is a classic-style rubber rifle pad, while at right are two typical "corrugated" pads. Rubber pads are available in a several thicknesses; while they can't actually reduce recoil, they can make it more bearable.

arms factory tested the same brake using a pendulum dynamometer, it showed a reduction of 51 percent. Johnson also found that his muzzle brake improved the accuracy of certain lightweight barrels by a dampening effect on vibration.

As with everything, there are advantages and disadvantages, and the same is true of muzzle brakes. They're not for everyone, and I for one refuse to use them because of their side effect of much increased muzzle blast. This can be extremely hard on our own eardrums and those of companions. When hunting in Africa there are always one or two trackers out front who fall back to muzzle level or just behind so as to be ready to take up the spoor. Once they experience the shattering blast of a muzzle brake on a powerful magnum they're not apt to be out front where they are needed, and then they often skulk behind to avoid the blast. Such a blast is especially bad when firing under a canopy at a range. Putting it into a cliche, my shoulder is a lot stronger than my eardrums!

It has long been noted that automatic or self-loading shotguns of the Browning long recoil or gas action type reduce kick. In fact, many shotgunners have gone to self-loaders solely to obtain the effect of recoil reduction. This effect is the result of spreading the recoil over a longer interval, and in the case of the original Browning long recoil system, it is utilized to perform useful work. I developed the first self-loading .458 Winchester Magnum rifle and got it function well *finally.* My tests showed that despite the Browning BAR gas system's benefits in reducing felt recoil with .300 Winchester Magnum BARs, .338s and the 7 mm Remington Magnum, etc., it failed to reduce felt recoil enough with full .458 loads to matter.

Mechanical devices to reduce kick have appeared from time to time, such as the Edwards patented recoil reducer, which must be implanted in the buttstock. Many swear by it and I have no doubt it works, but I'm not sure it works enough to adequately reduce the kick of, say, a .460 Weatherby Magnum significantly. Some twenty years ago the Hydro-Coil system was the rage for shotguns and some rifles. It is a hydraulic system which spreads the recoil over a longer interval, and it is well thought of by many shooters, especially competition clay bird shooters who fire thousands of rounds in practice and tournaments. Winchester adopted the Hydro-Coil as an option, but today it is available from stockmaker Ed Sowers, 8331 De Cellis Place, Sepulveda, CA 91343. Sowers makes a special stock which incorporates the Hydro-Coil. It's not a cut-rate affair, but it is very effective and has been employed on a .458 Winchester Model 70 with success.

Now available is the Counter-Coil, a hydraulic device which dampens recoil and is adjustable, as made and sold by MBM Enterprises of Route 4, Box 265, 715 E. 46th St., Stillwater, OK 74074. It is sold as a kit for $105 and a drill guide is furnished for $10. MBM claims a maximum recoil reduction of 46.5 percent and a minimum of 26.15 percent, with an average reduction of 40 percent. I have tested the device and it does work. Its effect was obvious on a 12 gauge shotgun but not quite so obvious on a Ruger No. 1 .458.

Fortunately, there are several things which can be done to reduce felt recoil or kick without resorting to muzzle brakes or hydraulic devices. First, of course, is a stock designed for heavy recoil. Such a stock should have an absolutely straight comb which recoils more or less straight back, a laid-back pistol grip which positions the hand away from the trigger guard, and a bolt handle which extends straight down and not swept back where it slams into the forefinger on firing. Sling swivel studs should not be mounted on forearms but on barrel bands mounted just forward of a short forearm. The forearm sectional shape should be round or slightly pear shaped, not slab sided, so the forward hand maintains a firm grip during recoil to maximize control as the muzzle lifts. A forearm shape like that of Winchester's .458 African is about right for most shooters. The comb must be well rounded and not sharp as with many European stocks. The butt area is the key to spreading the kick over the widest possible area, since the butt is that part of the stock which directly transmits "kick" against our shoulder.

Generally speaking, a big bore with the recoil of a .458 or over should have a butt which is six inches deep and two inches wide with a best quality recoil pad such as Pachmayr produces. Pachmayr makes a "Double Magnum" pad which is probably the best available for heavy recoil. Personally, I am not terribly sensitive to recoil so I opt for the deepest and widest possible butt area and use a Pachmayr solid Old English pad with rounded corners and no white line. I admit that my reason is aesthetics, but it works fine in taming kick when stock dimensions and weight are proportionate to the caliber. Others not so concerned in seeking the traditional British solid pad look can profit by going to the "Double Magnum" pad.

The weight of the rifle certainly does have a great deal to do with felt recoil, but not as much as some would have you believe. Mere extra weight without correct dimensions simply results in a club-like stock with more inertia. Use dense wood so that whatever the shape or styling, the wood's natural weight will help to reduce recoil's effect. Use plenty of barrel weight up front with big bores, and use 24-inch barrels to help keep the muzzle under control when it lifts during recoil. Use four or five-round "drop" magazines for emergencies and to add weight at the point of balance between the hands. If these things are done in conjunction with straight stocks,

Muzzle brakes reduce felt recoil by venting and redirecting burning gases. They do lessen "kick," sometimes very significantly, and also reduce muzzle jump and aid in more recovery for subsequent shots. Top left is John Buhmiller's muzzle brake on his wildcat .450 Buhmiller; left is the integral muzzle brake on a Weatherby .460. Top, the Mag-Na-Port is extremely effective, as is Harry Lawson's brake, above.

denser wood, large butt surface area, a good one-inch recoil pad or better, a medium-heavy 24-inch barrel with the increased diameter extending right to the muzzle, and don't forget the laid-back pistol grip, you will substantially reduce "kick."

Aside from the design of the rifle itself, recoil must be dealt with by adopting shooting positions which control it. The prone position is not one for big bore magnums, but the main culprit in creating a flinching habit is the firing of big bores from a bench at a range. When firing from a bench, one is braced against recoil because the elbows are on the bench and both the butt and the forearm are resting (or should be) on sandbags or a rifle rest with leather bag forward and a "rabbit ears" leather bag aft. The shooter is seated and leaning into the rifle. This position is the most rigid, and our anatomy must absorb the maximum recoil force. The shoulder and cheek feel the kick more intensely than when shooting offhand when we rock back with the recoil. The face is also angled forward and down tight so that we feel the hard jab of the comb against our cheek bone, which can cause painful welts. Here is where the worst flinching is caused.

The big bore rifle should first be fired from offhand to get used to the recoil, even if not actually sighted in. The body rolls back "with the punch" so to speak, and this makes a vast difference in *felt recoil* as compared to that of bench firing. Sitting is a fine position for hunting accuracy and range work which also allows the body to give with recoil. The shooter himself must do the sighting in, and this means bench firing. Pad the shoulder with a folded sweater, towel or a folded zipper rifle case of ample thickness. Some prefer to use sandbags for this, but whatever is placed over the shoulder is best held in place by slipping it under the shirt or shooting coat. Heavy shooting coats as used by competitive riflemen are best for such bench resting of big bores since they have integral shoulder and elbow pads. The elbows really suffer when shooting heavy recoiling calibers, especially with rough, weathered board tops on benches. The heavy shooting coat or rifleman's coat as used in competition is the preferred big bore "body armor." They are made by the 10-X Manufacturing Co., 1745 So. Acoma St., Denver, CO 80223 and Bob Allen Sportswear, P.O. Box 477, Des Moines, IA 50302. These heavy competition rifleman's coats with their thick, leather-covered neoprene shoulder and elbow pads go far to minimize the kick of big bores.

Another factor in minimizing kick is a slightly longer than normal length of pull which reduces the leverage of muzzle and comb jump. An erect head position rather than the cramped forward "stock crawler" position handles recoil best, and a stock and shooting position which place the butt solidly on the shoulder crotch, and not on the shoulder alone, handle kick best. For the shoulder joint to take all the thrust of recoil can cause serious problems such as bursitis. The toe of the recoil pad should not stab the soft tissue of the pectoral area or be positioned too low so that only the heel of the pad contacts or a painful bruising can result. The edges of any recoil pad should be slightly rounded to preclude sharp corners from cutting into soft tissue. Once you have a properly fitting and dimensioned stock of good weight and a good heavy recoil pad, and if you follow the aforementioned shooting tips, then forget "kick" or recoil and concentrate on learning to shoot your heavy. It is certain that once the psychological dread of "kick" is not foremost in the mind, it becomes a minor or nonexistent problem. When you fire that shot at the big one, you won't recall the "kick" afterwards, or anything but the thrill of that "moment of truth" when it was only yourself and a mighty beast.

Stock design plays a major role in felt recoil. The old Winchester Model 1895 in .405, though fairly modest in power, was a vicious kicker due to its narrow steel crescent buttplate and low comb. Modern designs are more efficient, but proper fit is the most important criterion. Classic-style stocks like the Holland and Ruger direct recoil straight back and are favored by many shooters; others prefer Weatherby's forward-sloping Monte Carlo or Lawson's thumbhole.

Shotgunners and users of .30-06/.308 class rifles have long realized that gas-operated semi-autos' operation soaks up a lot of recoil. In big bore persuasion only the Browning BAR has been made in .338, but the author rebarreled a BAR to .458 and got it to function; however, even it failed to tame the .458's recoil.

CHAPTER 14

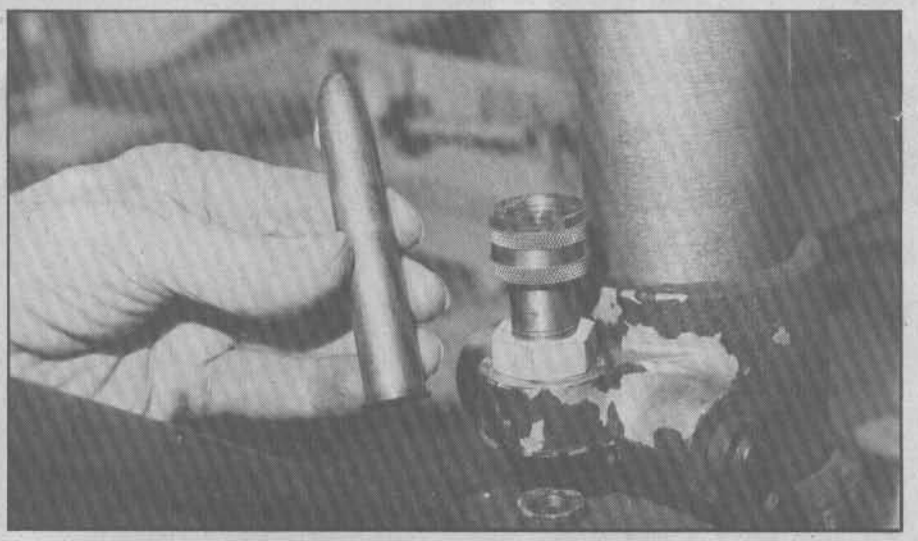
HANDLOADING THE "HEAVIES"

In most cases, economics or availability of ammo dictate that big bore buffs be handloaders. Here are some tips for reliable reloads!

Handloading the big bores is basically like handloading any centerfire ammunition, but there are some specialized components and techniques involved. I won't attempt to make this chapter an introduction to handloading—you can get that from any of the various manuals available, but here are some tips for big bore loaders who already know the fundamentals.

If you're dealing with domestic standard big bores such as the .458, .375 or the Weatherbys, you of course know the cartridge's dimensions. But if you acquire a wildcat or an old British or European rifle, the first step is to determine the exact dimensions of bullet and cartridge. There are a number of various bullet diameters which must be correctly matched to the actual *groove* diameter of your barrel as determined by accurately measuring a tightly fitting lead slug which has been fully expanded to your barrel's inside diameter. Use a slightly undersized lead bullet and expand it by first placing it in the muzzle end of the barrel. Hold the rifle, muzzle down, on a smooth steel plate. Expand this slug by tapping from the barrel with a cleaning rod or other steel or brass rod with a smooth surface. When fully expanded, drive out the slug and catch it on a cloth pad so as not to deform it. Then with a one-inch micrometer (not vernier calipers), measure the diameter in thousandths of an inch. If you desire, this can be done by a gunsmith. If there is doubt about the chamber itself, the best method is to make a sulfur chamber cast of the chamber and the barrel throat as well as the beginning of full rifling. This is easily done by obtaining a supply of sulfur from a pharmacy and first plugging the barrel with a tight cloth patch or other cloth plug placed some two inches or more beyond the end of the chamber. Holding the rifle vertically, muzzle down, pour the melted sulfur into the chamber (with a funnel, if desired) until the sulfur fills the chamber and a bit more, but not spilling into the lug recesses. Allow to harden, then carefully push out the plug with a cleaning rod from the muzzle and catch this fragile plug in a pad of cloth. Measure diameter with a one-inch micrometer; the lengths of the chamber body and neck and overall length can be measured with a steel scale or vernier calipers. Use these dimensions to determine your rifle's correct cartridge size. Bullet diameter is measured across the *lands* of the barrel cast or expanded lead slug, which represents the groove diameter, and the bullet diameter within a thousandth of an inch or so.

For example, the .475 No. 2 Nitro-Express uses a .483-inch diameter bullet, but the .475 No. 2 Jeffery Nitro-Express fires a five-thousandths larger diameter bullet, or one of .488-inch diameter. In most cases the big bore will have the caliber engraved or stamped on the barrel root or with the proof marks, and on the barrel flats with doubles. With metric calibers, the caliber may be given only as a *bore* diameter, as when a 9.3 barrel is stamped "9 mm." With metric cases, especially, there are many rifles of the same groove (bullet) size which use different cases; therefore, the



Handloading these big calibers requires some hefty equipment. This magnificent set of massive cased dies and other tools for the mighty .577 Nitro was made by the old Hollywood firm.

The huge .577 750-grain steel-jacketed Kynoch solids make a real handful. The carefully radiused jackets at the base of the bullet do not require any case mouth flaring for seating.

sulfur cast must sometimes be resorted to. Many British case and cartridge designations, as well as many U.S. cartridges, use designations which are purely commercial and which give no precise idea of the actual bullet diameter.

In reloading straight-tapered cases such as the .458 Winchester Magnum, the .405 or the .450 3¼-inch, be extremely careful in full-length resizing and crimping, so as not to accordion (buckle) the case. It is best to use a three-die set for such cases, and such are usually furnished by RCBS and other top die makers. Don't forget to order your dies with crimping shoulders.

Despite the availability of most of the British and metric cases with Boxer primer pockets, many will want to continue using good Berdan pocket cases for the scarcer calibers. These aren't difficult to decap with a Berdan decapper as available from RCBS or Huntington Die Specialties Co. Correct Berdan primers can be obtained from Dave Cumberland's Old West Gun Room, 3509 Carlson Blvd., El Cerrito, CA 94530. Cumberland sells the RWS substitute for Kynoch's last large rifle Berdan primer, the non-corrosive and very violent No. 172. These are the RWS No. 6507 primers. Other Berdan primer sizes are also available from the Old West Gun Room.

The Brass Extrusion Laboratories, Ltd. of Jim Bell produces Boxer cases for the popular Kynoch nitro-express calibers, including the .470, .404, .425 Westley Richards, .500 3¼-inch and .500 three-inch, as well as basic .500 3¼-inch brass which can be used to make .465, .470, .476 and other cases. B.E.L.L. also makes outstanding 500-grain steel-jacketed solids for the .470, and produces loaded ammunition for that caliber. My testing in a Westley Richards rifle shows it to be close-grouping ammo. B.E.L.L. will soon offer .416 Rigby cases and cases for the .500 Jeffery and the .505 Gibbs. Those with .416 Rigby caliber rifles can also make cases from .378 or .460 Weatherby Magnum brass by first turning off the "belts" in a lathe. B.E.L.L. also makes the popular .450 3¼-inch cases for the .450 3¼-inch Nitro-Express. This can also be made into .475 straight brass, .369 Purdey, .333 Flanged Jeffery, .450/.400 3¼-inch, .360 No. 2, etc. Both B.E.L.L. and Huntington Die Specialties sell .416 caliber, 410-grain steel-jacketed Hornady solids, as does Bruce Hodgdon. This special lot of .416 solids is not, however, available as a regular Hornady item. B.E.L.L.'s .404 brass makes up into the .280 Jeffery, .333 Jeffery rimless, 9.5x73 Miller & Val Greiss and the .460 G&A and .450 G&A Short Magnum as well as the .416 and .423 Van Horn Magnums.

B.E.L.L.'s basic 3¼-inch .50 Sharps brass and their RCBS .45 basic case both provide the basic brass for a variety of Sharps and other long black powder U.S. cases. Owners of .30, .33 or .35 Newton rifles can make brass from 8x68S RWS Boxer cases. Owners of .350 Rigby Magnum rifles can make cases from .375 H&H Magnum brass after turning the "belts" off in a lathe, then re-forming in RCBS dies. Those with .400/.350 Rigby rifles can make cases from 9.3x74R brass, as can those with .400/.360 rifles. Owners of .405 Winchester rifles can also use 9.3x74R brass to make good cases.

Bullets have long been a problem for the owners of some of the larger and less common British nitro-expresses, such as the .577 and the .600, or any of the .475s, such as the straight .475, .475 No. 2 and .475 No. 2 Jeffery. All but the .475 No. 2 Jeffery use .483-inch, 480-grain bullets, but the Jeffery round uses .488-inch, 500-grain bullets. Barnes Bullets of P.O. Box 215, American Fork, UT 84003 has or will make any of these nitro-express bullets, or one can obtain molds for paper-patched bullets of original weight and drive these as fast as the original loads. When such cast and paper-patched bullets are heat-treated, they are quite hard enough for use on heavy game at velocities up to about 2,200 fps, which is within the original velocity range in most instances. Richard Hoch of the Gun Shop, 62778 Spring Creek Road, Montrose, CO 81401 can help with molds.

Lead alloy bullets made of wheel weight metal (three percent antimony) are heat-treated by heating in an oven to 450 degrees for two hours, then quenching in cold water and aging for 17 days. These will be half again as hard as linotype metal, which is also a good alloy. Another option is of three parts antimony and seven parts plumber's lead. Heat to 480 degrees for four hours, 20 minutes, quench within three seconds and age for nine days. It should harden to 20 BHN (Brinell hardness), and such bullets can be used on the largest game if properly paper-patched.

With reason, the most popular big bore U.S. caliber is .458, and Steve Hornady informs me that his new 500-grain Hornady .458-inch soft-nosed "Interlock" bullets are newly reinforced for increased resistance to deformation and weight loss. Steve sent us a supply of these and my "torture tests" indeed proved these fine bullets to be much tougher than their predecessors. Hornady 500-grain steel-jacketed solids are now the only ones available since Winchester components have been unavailable for handloaders. This has no effect on the availability of factory loaded ammo. The unavailability of Winchester bullets for handloading, especially steel-jacketed solids, isn't an unmitigated tragedy, however, with Hornady's fine steel-jacketed solids available including their 250-grain .338, 300-grain .375 and 500-grain .458 solids. Hornady's soft-nosed bullets for these and other calibers are among the most accurate and deep-penetrating, especially with their new "Interlock" design.

Omark's Speer bullets are vital to reloaders of popular big bores such as the .338, .358 and .375 calibers, and I recently "torture tested" the new version of their 285-grain "Grand Slam" semi-spitzer with the "Mag-Tip" or slight nose flat which brings the jacket level with the exposed lead for no deformation in the magazine. I can heartily recommend this 285-grain tough customer.

Nosler Partition Jacket bullets have secured an enviable and deserved reputation for maximum penetration combined with full expansion at all hunting ranges. This combination of hydrostatic shock, full expansion and non-disintegration has endeared these bullets to the users of ultra-high velocity magnums. Unfortunately, Nosler no longer produces their former 270-grain and 300-grain .375 caliber Partition bullets, a few of which I still hoard on leftover handloads from my last African safaris. The penetration of Nosler Partition Jackets is second only to that of solids, and fortunately, the owners of 8 mm Remington Magnums, .338s or .340s have an ample choice of weights available. The 200-grain .323-inch (8 mm "S" diameter) is a deadly projectile which can reach out to the longest hunting ranges and still penetrate and expand from any angle on our biggest game. The .338 210-grain spitzer and the 250-grain semi-round nose Partitions are both great bullets with ample toughness for the largest North American and all African thin-skinned game. Such bullets are perfect for the largest, most dangerous bears and African lion.

Bill Steigers' Bitterroot bullets use a

To slug the bore, insert a soft lead slug in the muzzle, rest the muzzle on a flat metal surface and tap the slug with a rod to make it upset to fill the rifling grooves and then measure it with a micrometer.

pure copper jacket which is actually soldered to the core, thereby enabling the core and jacket to remain bonded during the greatest expansion. Bitterroots also have the jacket flush with the exposed lead for non-deformation in the magazine. Bitterroots do not break up on impact but "ball up" slowly until the jacket flanges (with core still clinging) are fully expanded. As a result of this toughness and core/jacket bonding, Bitterroots rarely lose more than 15 percent of original weight, usually retaining about 90 percent. This means that Bitterroots do not have to be in the heaviest weights-per-caliber as more expanded weight is retained.

Sierra's bullets have long been favorites with match shooters, but for some years they have been winning an equal prestige among hunters. One unique reason for going to Sierras is that they alone furnish boattail expanding bullets for the 8 mm Remington Magnum or the 8x68S, etc. in the heavy 220-grain weight. They also offer a 250-grain .338 and a 300-grain .375 boattail. Such bullets transform these magnums into authentic long-range calibers by providing the high coefficients and streamlining needed for maximum retained velocity at the longest hunting ranges. This not only flattens trajectory, it increases retained velocity and striking energy out there where it is needed for such shots.

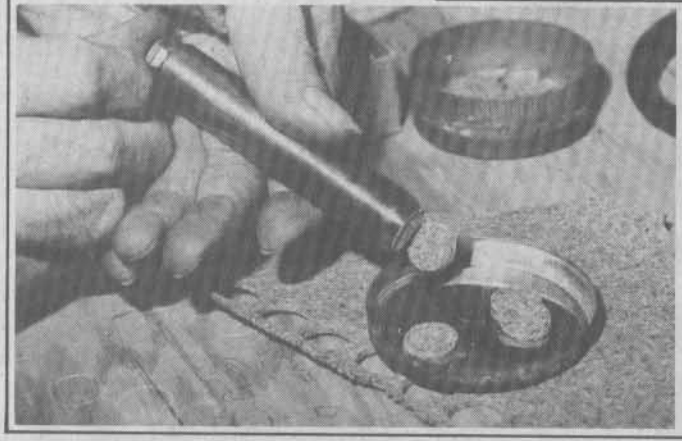
Remington's 185-grain and 220-grain Core-Lokt pointed soft-nosed 8 mm Magnum bullets are also available to handloaders for this powerful metric and for owners of 8x68S, 8x64, 8x60S and 8x57JS rifles. Hornady also makes an excellent 220-grain semi-spitzer .323-inch 8 mm "S" bullet for the above calibers. Other bullets than those mentioned certainly merit your patronage, but, unfortunately, space limitations limit our coverage.

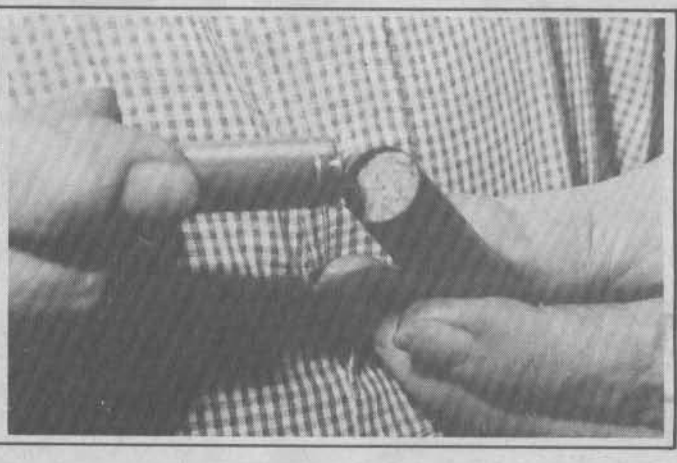
RCBS has always been our mainstay for dies and other reloading gear, and now the founder, Fred Huntington, and his sons are operating independently as Huntington Die Specialties Co., P.O. Box 991, Oroville, CA 95965. Obtain a Powley Computer from Marian Powley, Petra Lane, R.R. 1, Eldridge, IA 52748. It is an inexpensive, but to me, indispensable slide rule for calculating safe handloads and powder selection, based on *your* barrel's length. It selects a powder and load which is 85 percent of maximum and tells you the velocity. To be used in conjunction with the Powley Computer is the "PSI Calculator" which will compute pressures within about 5 percent for loads calculated with the computer.

Loads for double rifles are perhaps the most advanced type of handloading, and it would take a very long article to outline the entire subject. Certain peculiarities are common to double rifles and their loads, which must "regulate" or shoot so that both barrels share a common point of impact within acceptable limits. When the bullets are too light or moving too fast, they shoot across each other's path, or crossfire. With bullets which are heavier than those originally used in regulation or of correct weight but moving too slow, you will find they shoot apart. Try to find out the original bullet weight from the proof marks, and if metric, use a conversion table to determine the weight in grains. Generally speaking, one can use the original weight of cordite in British nitro-expresses as the basis for a beginning charge of suitable IMR (Du Pont) nitrocellulose, since cordite is more potent per grain than nitrocellulose. It usually takes about 10 percent more canistered IMR 3031 or 4064 to equal a cordite load for the .470, for example. *Do not* use 3031 or 4064 with the last Kynoch non-corrosive large rifle primers, the No. 172. This primer is too violent for such powders in any *bottleneck* case, but it works with these powders in straight-tapered cases such as the .577 or .600. For the Kynoch No. 172 primer, use 4350 and other slow-burning powders for bottleneck nitro-express cases. The reason I mention this now-obsolete primer is that many are around, and I still use it, preferring it because it lets me use bulkier, slower nitrocellulose powders for superior loading density and top accuracy in the big British nitro-express calibers for doubles. But the RWS (Dynamit Nobel) replacement primer for the Kynoch No. 172, the RWS No. 6507, is an outstanding non-corrosive primer which works well with our nitrocellulose powders such as 3031 and 4064 for the .470, .465 and similar nitro-expresses. See my article "The Double Rifle—Its Care and Feeding" (*Gun Digest, 1979*) for more detailed information.

Brass Extrusion Laboratories, Ltd. furnishes load information for the .470 and other nitro-expresses. I prefer to use over-powder cork composition wads for the big British nitro-expresses, using two, down hard on the powder. They quickly break up with combustion, but they hold the powder charge down uniformly in relationship to the primer and improve combustion and uniform accuracy in the oversize cases. Kynoch always used jute wads in such cases, but *no wads* should ever be used for loads which were worked up *without wads* or pressures will go up—sometimes too much. Cork composition gasket material can be bought at most auto supply stores in about ⅛-inch thickness, which is the correct thickness for wads. Cut the wads with hollow punches made from drill rod with

To hold the powder in place for uniform combustion, an over-powder wad is desirable for these big calibers. Author Lött uses cork gasket material. He cuts correct size wads with a special punch (L), pushes the wads out of the punch from the rear (below left) and inserts them over the powder charge (lower R.).



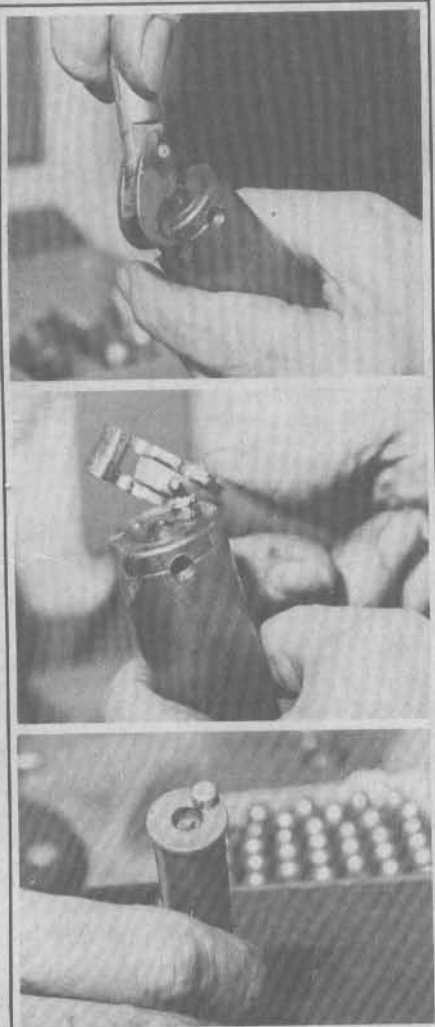


an ejector hole to push out the cut wads with a punch. A simple cutter can be made by cutting off a suitable case and drilling out the primer pocket for a punch to push out the wads.

One final admonition to loaders of ammo for tubular magazine lever action rifles such as Winchester's Model 71 or Model 1886, as well as Marlin, Bullard or other tubular magazine rifles. Do *not* load round-nose or pointed-nose bullets in such rifles, regardless of what you may have read about round-nose bullets being suitable. Whereas many have gotten away with such flirtations with disaster for a time, several cases are on record where a round-nosed handload has set off the whole magazine with almost a total loss of the left hand! Use *flat-nosed* bullets *only* for such tubular magazine rifles. For flattening the noses of 400 or 500-grain bullets in .458 caliber, obtain special dies from Huntington Die Specialties Co.

It may come as a surprise to many that bullets can have almost as much of a romantic aura as the rifles which fire them, but to me, certain bullets are old friends. They are the objects of my attention and concern as I load my rifle the morning of the hunt—will they shoot true and will they then perform? Mostly I remember the glint of an African sunrise on the .375 Silvertips, and how cold they felt as I charged my Holland-Mauser's magazine in camp on the edge of Rhodesia's Gazuma Forest in 1963. It was the morning of a memorable lion hunt when I would see eight lions in the open grassland of the vast Gazuma Pan. Again it was Silvertips in 1974, this time 250-grain .338 Silvertips which I had squeezed down to .330 caliber for my .318 Holland & Holland double. That was by the confluence of Rhodesia's Lundi and Chiredzi rivers near Mozambique, where I was hunting a great Livingstone's eland bull. How would the re-formed bullets do on the one-ton antelope? Then I recall retrieving one 750-grain solid load for my .577 Holland which I had dropped in the red mud of the low veld bush, wiping it clean on my camouflage. I had wounded a buffalo bull who was somewhere nearby—waiting. Would the two solid loads salvage what was becoming a very nasty confrontation with the beast?

The bullet is the thing, because it is only the bullet—the whole bullet and nothing but the bullet—which can translate your finest rifle, best aim, days of sweat and toil, to say nothing of hard-earned cash, into a trophy!



Contrary to popular opinion, Berdan primed cases are easy to decap. The case is inserted into a special holder and the hooked tool digs the primer out (top and center). Take care to adjust the tool not to dig too deeply and gouge the permanent anvil shown in the primer pocket.

BIG BORE BULLET DIAMETERS, ENGLISH, U.S. AND METRIC

British	U.S. Factory & Wildcat	Metric	Inch Diameter
		8x57J	.318
		8x57JR	.318
		8x75	.318
		8x60	.318
		8x57JS	.323
		8x57JRS	.323
		8x60S	.323
	8 mm Rem. Magnum	8x68S	.323
.318 W.R.			.330
.333 Jeffery rimless			.333
.333 Jeffery rimmed			.333
	.33 WCF		.338
	.338 Win. Magnum		.330
	.340 Weatherby Magnum		.338
	.348 WCF		.348
	.35 WCF		.358
	.358 WCF		.358
	.35 Whelen		.358
	.35 Ackley		.358
	.350 Griffin & Howe Mag.		.358
	.35 Newton		.358
.350 Rigby Magnum			.357
.400/.350 Rigby		9x57	.356
.350 No. 2 Rigby		9x56 M.S.	.356
.400/.360			.367
.360 No. 2			.367
		9.3x62	.366
		9.3x64 B.	.366
		9.3x74R	.366
.375 H&H Flanged Magnum			.375
.375 H&H Belted Magnum	.375 H&H Magnum	9.5x57	.375
.369 Purdey	.375 Improved & Wby.	9.5x56	.375
	.378 Weatherby Mag.	9.5 M&V.G.	.375
.400/.375 N.E.			.375
.400/.375 Belted N.E.			.375
.450/.400 3¼-inch N.E.			.410
.450/.400 3-inch N.E.			.410
	.405 WCF		.411
.416 Rigby	.416 Van Horn		.416
.404 Jeffery	.423 Van Horn	10.75x73	.423
		10.75x68	.423
.450 3¼-inch N.E.	.458 Win. Mag.		.458
.500/.450 3¼-inch N.E.	.460 Wby. Mag.		.458
.450 No. 2 N.E.	.460 G&A		.458
	.450 G&A Short Mag.		.458
	.450 Watts		.458
	.450 Lott		.458
	.450 Alaskan		.458
	.450 Ackley		.458
.500/.465			.468
.500/.470	.475 A&M .475 V.H., .475 LTD		.475
.476 Westley Richards			.476
.475 3¼-inch N.E.			.483
.475 No. 2 N.E.			.483
.475 No. 2 Jeffery N.E.			.488
.505 Gibbs N.E.			.505
.500 Jeffery N.E.		12.7x70 Sch.	.510
.500 3-inch N.E.	.510 Wells		.510
.500 3¼-inch N.E.			.510
.577 2¾-inch			.585
.577 3-inch N.E.			.585
.600 N.E.			.620

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