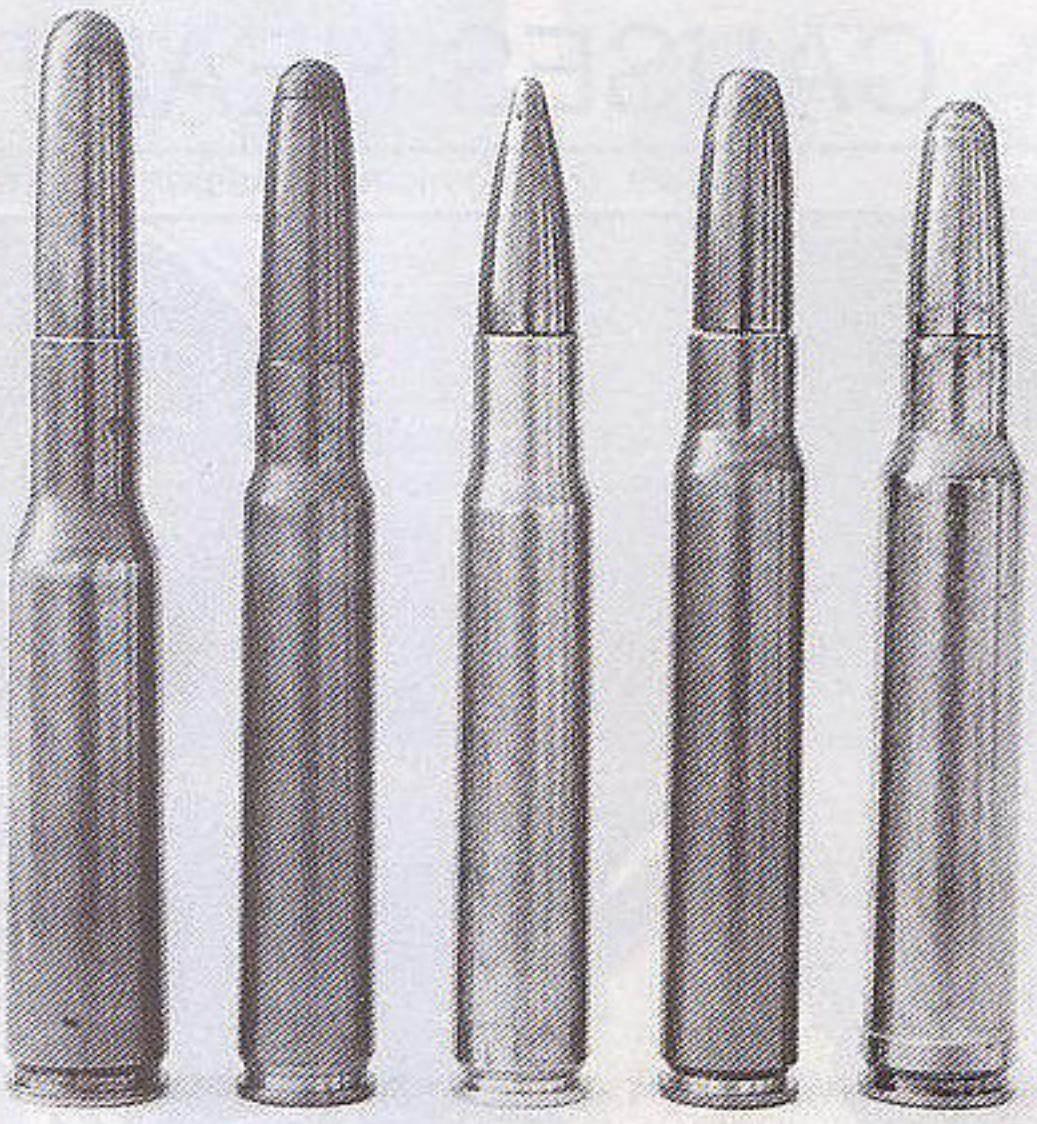
Think Thirty-Three Calibre

By Gregor Woods



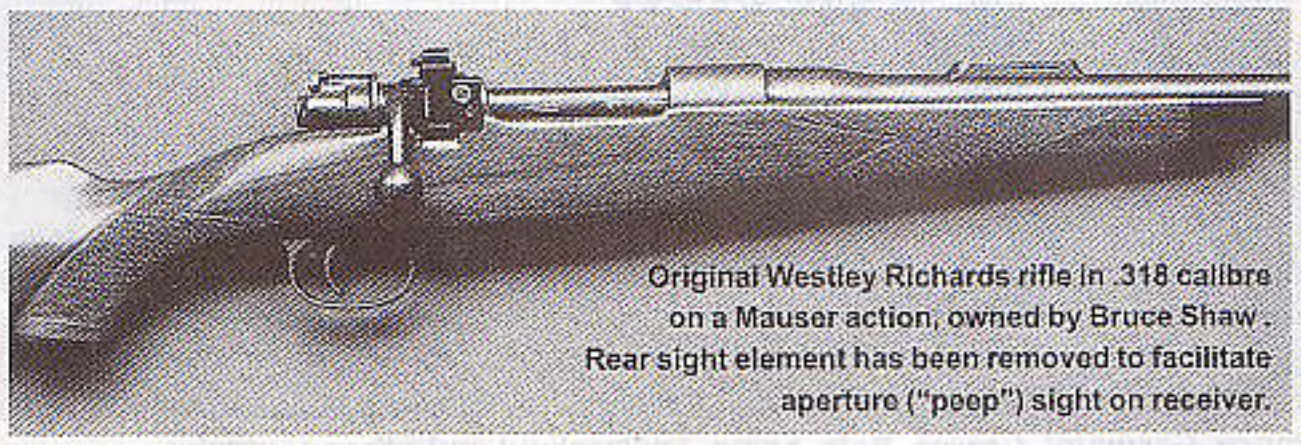
Line up of the most practical thirty-threes for African use. Left to right: .333 Jeffery; .318 Westley Richards; .338-06; .338 Sabi and .338 Winchester Magnum.

I think it can safely be said that, today, the world's most widely used bullet diameter for non-dangerous game is .308 , i.e. the 'thirty-calibres' – .30-30, .308, .30-06 and the various .300 magnums. In Africa, this was not always the case – up until the 1950s this position was held by the .33-calibre in the form of the .318 Westley Richards and the .333 Jeffery. In *African Rifles and Cartridges* (1948) Taylor wrote that the .318 Westley Richards (.330 bullet diameter, 250gr bullet at 2400fps) was the most widely used British medium bore in Africa, and far more popular than the .30-06. After World War II, British interest in African hunting dwindled, and the safari became the domain of the Americans, whose most popular cartridge for non-dangerous game was the .30-06 (mostly used with 220gr bullets at 2400fps for African hunting). Then Kynoch stopped making all rifle ammunition, forcing the .318 Westley Richards and the .333 Jeffery into obsolescence.

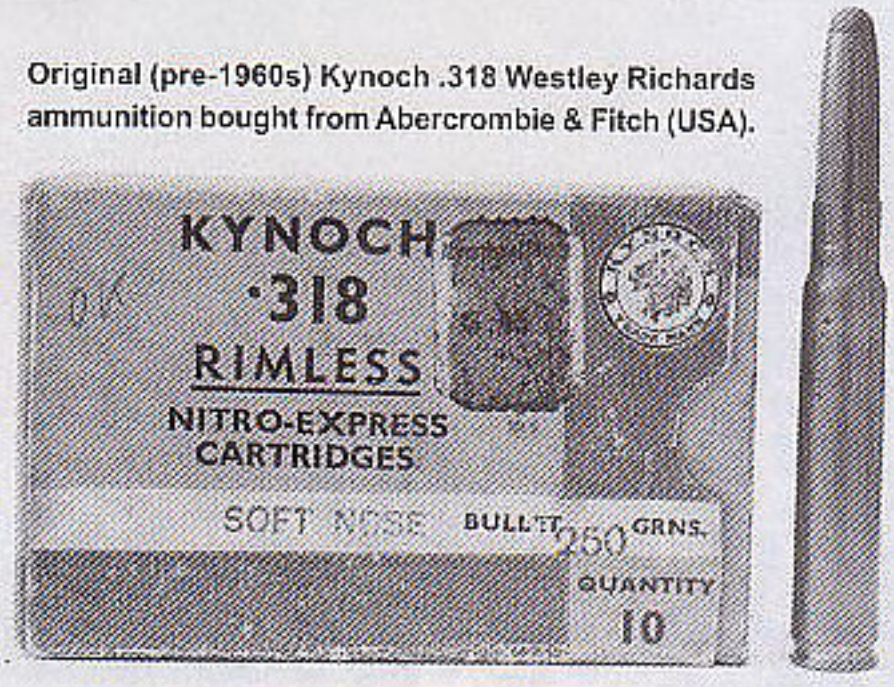
There are several reasons why the .30-calibres became the world leaders. Firstly, the military backgrounds of the .30-06 and the .308 Win played an enormous role in ensuring their widespread and on-goihg success as sporting cartridges – ex-soldiers use what they are familiar with and can get cheap ammunition for. Rifle manufacturers thus offered a wider range of sporter models in .30-calibres than in others. Consequently, ammunition manufacturers generally offer a wider range of bullet weights, shapes and designs in .30 calibre than in others. Another important factor is that by far the majority of game animals hunted around the world today are in the weight class of the whitetail deer, roedeer, impala, etc, which do not require a bigger bullet than .308 . Thirty-calibre is a good compromise for all-round hunting of non-dangerous game. Gun dealers stock more .30-calibres because they know these are sure sellers, and salesmen recommend them, hence the success of cartridges like the .30-30, .308 Win, .30-06 and .300 Win Mag becomes self-perpetuating.

About twenty years ago I began to question whether the .30-calibres were reliable enough performers for the larger antelope (kudu, gemsbok, wildebeest weight class). For broadside shots I found them satisfactory, but for angled shots, where your bullet has to smash through the heavy shoulder bone, or rake through the abdomen to reach the vitals, the .30 calibres cannot always be relied upon to do the job. They may disintegrate, or the cores separate from the jackets, or they expand too rapidly and hence do not penetrate. I wanted a bullet that would hold together better, destroy more tissue and kill more quickly. Of course, when I made this decision two decades ago, we did not have strong premium grade bullets such as Barnes-X, Swift A-Frame, Rhino solid shank, etc. However, as the vast majority of hunters today still use ordinary 'conventional design' bullets, the principle holds true in general. I am not saying that the .30-calibres are inadequate; I am saying that in my experience the bullets too often fail in large game, requiring second shots and sometimes lengthy follow-ups.

So I started moving up, beginning with an 8x57 (.323 bullet diameter) using 220gr bullets at 2450fps. For the most part it killed well, but I still had occasional bullet failure and penetration problems. At the time I did not consider a .338, mainly because in those days the only one locally available was the .338 Win Mag which, though fine for long range use, was a bit fast for bushveld hunting with conventional bullets. The .338 Win Mag was seldom seen in Africa, so I never gave it much thought. Instead I bought a 9.3x62 (.366 diameter, 286gr bullet at 2300fps) and finally I was satisfied.



Original Westley Richards rifle in .318 calibre on a Mauser action, owned by Bruce Shaw . Rear sight element has been removed to facilitate aperture ("peep") sight on receiver.



Original (pre-1960s) Kynoch .318 Westley Richards ammunition bought from Abercrombie & Fitch (USA).

Since then, however, things have changed. Slower .338 cartridges have once again become available which work extremely well with conventional bullets. And the development of ultra-strong premium grade bullets has made some of the .338 magnums good all-terrain cartridges for large antelope (if you are willing to accept meat damage at bushveld distances). For readers who have not previously considered them, perhaps it's time to re-evaluate the .33-calibres for African use. So let's go back and see what made them so successful in the first place.

It is difficult to work out which came first, the .318 Westley Richards or the .333 Jeffery. *Cartridges of the World* gives their introduction dates as 1910 and 1911 respectively, but Jeffery's 1910-11 catalogue lists the .333 as the '1908 Model' and a Westley Richards catalogue contains a testimonial from a satisfied buyer of a .318 which he used to kill ten elephant; the letter is dated March, 1909, so he must have had the rifle at least by 1908.

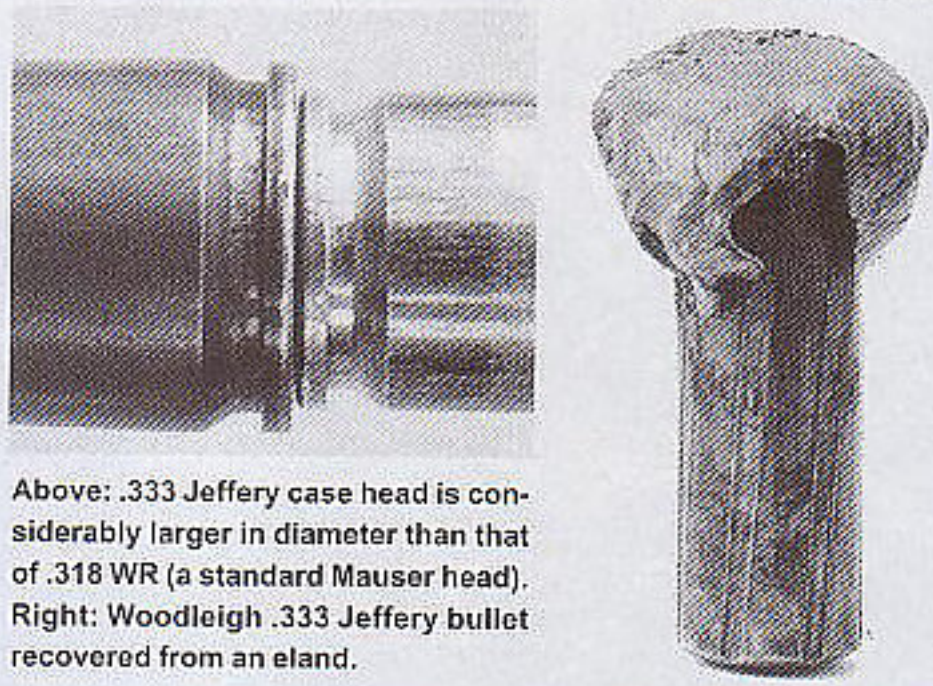
The .318 was an immediate success and went on to become a legend (see our June '94 edition). It was not intended as a cartridge for large dangerous game, but many used it for this purpose, the most famous being 'Karamojo' Bell, the professional ivory hunter. It was his favourite elephant cartridge, and he once used a pair of .318s to kill nine elephant bulls with nine shots in one chase. In *Karamojo Safari* he wrote (in the context of cartridges for elephant hunting): "In my opinion the 250gr .318, although far from perfect, approaches most nearly the big game hunter's ideal bullet, followed by the 7.9mm or 8mm Mauser." Taylor wrote that the .318 is "fully capable of driving its bullet the *length* of a big elephant's body." Professional hunter Harry Selby told me that he once shot a black rhino in the chest (frontally) with his, and the bullet exited at the hip. Gustav Guex, who hunted buffalo professionally to supply meat for the labour force of the Sena sugar estates in Mozambique, used nothing but a .318, and in 12 years killed 7000 buffalo.

What made the .318 so effective? The ideal combination of bullet diameter, weight, and velocity. Aside from shot placement, the most important factors for determining a bullet's effectiveness on large game are penetration and bullet performance. All other factors (such as bullet construction) being equal, it largely comes down to sectional density and momentum. In simple terms, sectional density refers to a bullet's weight *relative to its diameter*. A bullet that is heavy for its calibre will be a long bullet, and is said to have a high sectional density factor – this is very important to achieving deep penetration. Bullets of high sectional density also retain their velocity and energy better in flight, meaning they shoot flatter and hit harder than bullets that are light (short) for their diameter.

But there were several bullets with high sectional density, namely the 6.5mm's 160gr, the 7x57's 175gr, the .30-06's 220gr and the .303's 215gr. What made the .318 so much better? Simple – its heavier bullet. Momentum is the product of bullet weight times velocity. The .318's secret was its 250gr bullet, coupled with just the right velocity to provide all the penetration you could want without over-stressing the bullet, causing it to distort or break up. And of course its larger diameter also played a role in that it cut a bigger wound channel.

In the case of FMJ or solid bullets, high sectional density (coupled with adequate momentum) provides deep penetration and keeps the bullet on a straight course inside the target, which is why the .318 was so effective on huge beasts like elephants and rhino. In the case of soft nose bullets, all other factors being equal, those of high sectional density penetrate deeper simply because there is more of the bullet remaining after the front end has been eroded away by flesh and bone, and this retained weight provides greater momentum. Again, the .318's moderate velocity of 2400fps (actually about 2350) ensured that the bullet suffered minimal fragmentation.

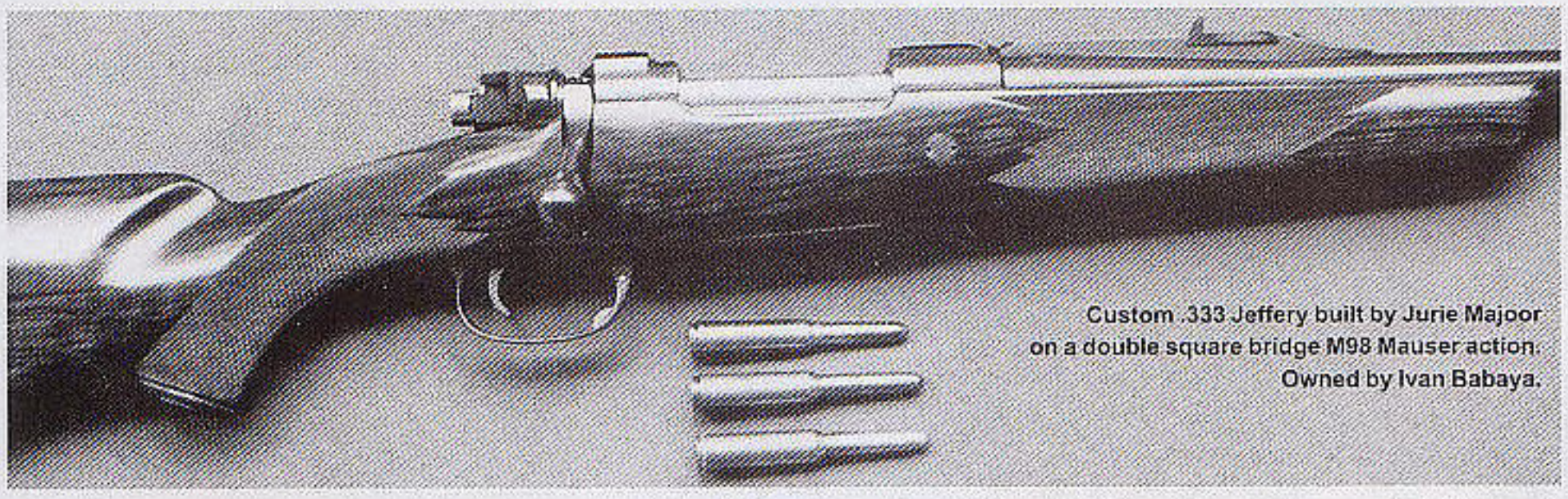
For the hunter of non-dangerous game who did not want the extra recoil and rifle weight of a 9.3x62 or a .375 H&H, the .318 (along with the .333 Jeffery) was far and away the best killer. It had better



Above: .333 Jeffery case head is considerably larger in diameter than that of .318 WR (a standard Mauser head). Right: Woodleigh .333 Jeffery bullet recovered from an eland.

penetration than both the 9x57 and the .350 Rigby (the .350 was offered in 225gr bullet weight only, which was too light for calibre (low sectional density). The .318 was ideal for farmers who *mainly* wanted to shoot antelope for the table and for rations, but who might occasionally have to sort out a marauding elephant, troublesome rhino or cattle-killing lion. Its recoil was low, facilitating very lightweight rifles, and the M98 Mauser and P-14 Enfield actions that Westley Richards used held five rounds in the magazine.

The .333 Jeffery was every bit as good, and most of what I have said about the .318 applies to the .333 as well. In fact, for those who wanted to hunt large dangerous game, the .333 Jeffery was even better, as it came in a 300gr bullet weight – just imagine the sectional density factor. The .333 is rather an odd-looking cartridge; it is not based on the usual Mauser case head, but on one of considerably larger diameter, and the case body is short and squat, while the neck is long. It also came in a flanged (rimmed) version for double rifles, but very few of these were made. The 300gr bullet was launched at 2200fps, which was ideal for bushveld use and made the .333 unbeatable in its class. However, a 250gr load was also offered, and this was Jeffery's mistake – it was a copper-capped hollowpoint bullet which was way too fragile for its 2500fps velocity, and according to Taylor, the .333's reputation was marred as a result

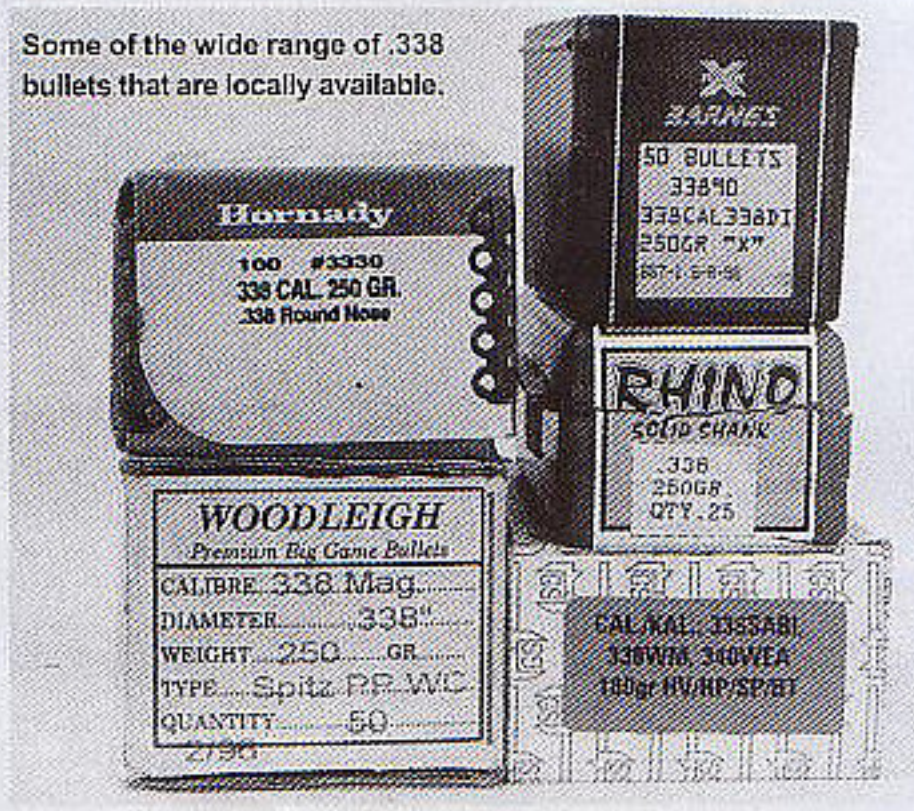


Custom .333 Jeffery built by Jurie Majoor on a double square bridge M98 Mauser action. Owned by Ivan Babaya.

– though popular, it never gained the legendary status of the .318. The Birmingham Small Arms Company made a similar mistake in 1923 when, wanting to climb on the .33-calibre bandwagon, they introduced the .33 BSA (aka .33 Belted Rimless) offering it in one load only – a 165gr bullet at 3000fps. It bombed.

Both the .318 Westley Richards and the .333 Jeffery were proprietary British cartridges (a sort of patent system preventing other gunmakers from building rifles in these calibres) hence were not well-known in America, where the .30-30, .30-06 and .300 H&H ruled. But Elmer Keith was a hunter who had learned the value of a heavy bullet of high sectional density travelling at moderate velocity, and he too, was less than impressed with the performance of the .30-calibres on elk and moose. So after WWII, he got together with Charles O'Neil and Don Hopkins and designed a wildcat by necking up the .30-06 case to take a .333 bullet. The .333 OKH, as they called it, looked exactly like the .318 Westley Richards, but Elmer, being Elmer, was not about to use a .330 bullet if he could get a .333 bullet. This new wildcat fired a 250gr bullet at a slightly higher velocity than the .318 WR. It was highly successful, and would have become immensely popular if .333 bullets had been freely available.

Encouraged, the trio took the .300 H&H case, blew it out a tad and necked it up to take .333 bullets, calling it the .334 OKH. This one used bullets that went up to 300gr (made by Fred Barnes). I have been unable to determine what velocities they got, but I would guess about 2400fps with the 300gr and maybe 2600 with the 275gr. Elmer was a gun writer, so the American shooting public was kept well-informed as to how much better this wildcat performed on elk and moose than did the .30-calibres. It created a great deal of interest, spawned a rash of other .33-calibre wildcats, and led to the introduction of the .338 Winchester Magnum.

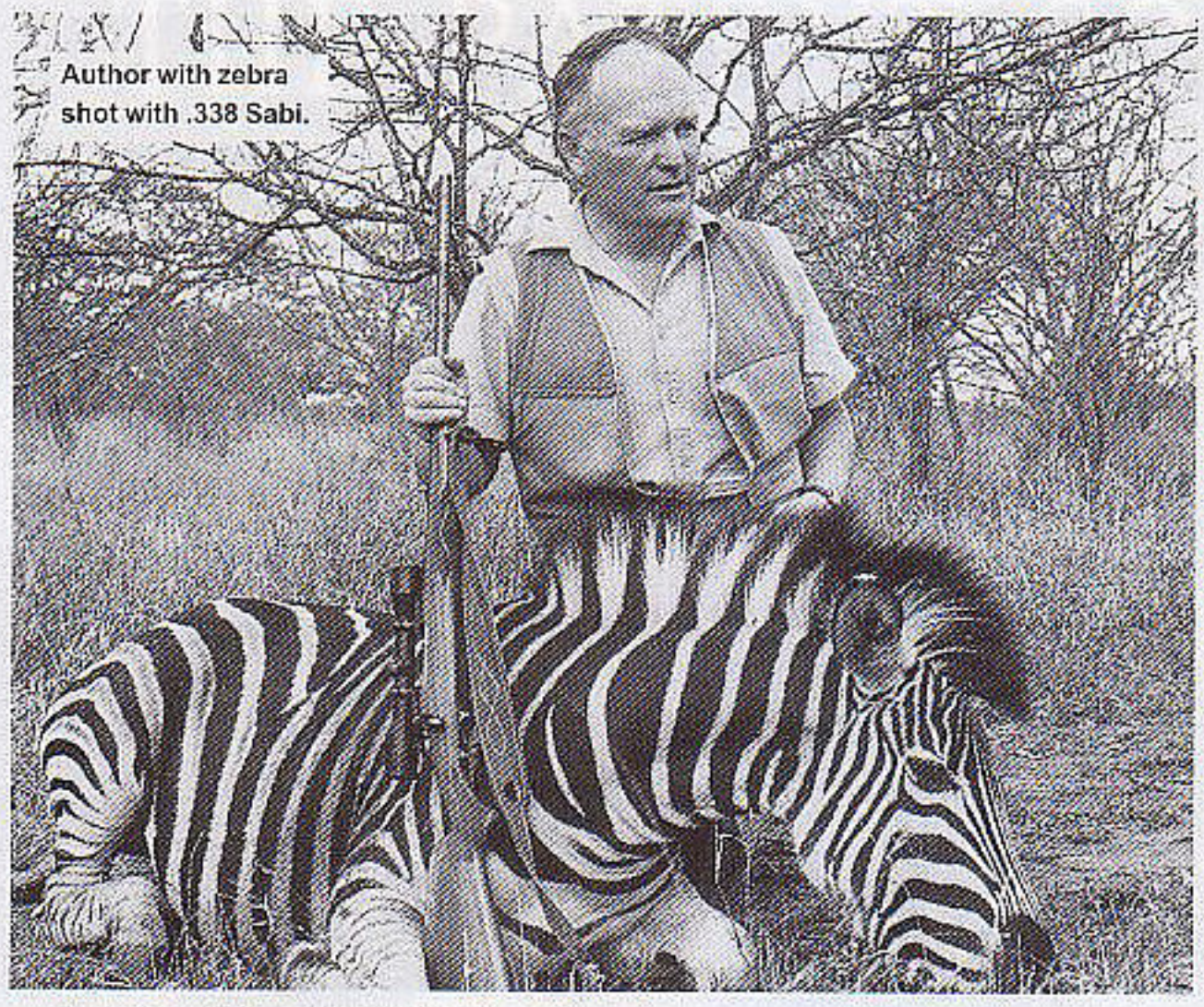


Some of the wide range of .338 bullets that are locally available.

Winchester had noted the burgeoning interest in .33-calibre wildcats, and in 1958 they took the .458 Win Mag case and necked it down to take a .338 bullet. It fired a 200gr bullet at an advertised 3000fps, a 250gr bullet at 2700fps, and a 300gr bullet at 2450fps. However, they dropped the 300 grainer (no doubt due to stabilization problems). The .338 Winchester Magnum was an immediate and on-going success in America, where they hunt elk, caribou and moose at long range.

However, it never had a chance in Africa. Its introduction came at a time when the colonial powers were starting to pull out of Africa, leaving many countries in a state of political upheaval and civil war – a condition which rapidly spread. Many African countries banned private firearm ownership and stopped all hunting. The safari industry went into a virtual coma in most parts of Africa. In southern Africa, where things were more stable, other factors came to bear. Sanctions and arms embargoes were slapped on Rhodesia, South Africa and South West Africa, making it very difficult and expensive to import sporting rifles and ammunition, and consequently only the top-selling calibres were brought in – new or little-known cartridges didn't get a showing. We were forced to depend more on our fledgling local sporting arms industry, which also produced only the most popular calibres – the .338 Win Mag was not among them.

There were other reasons. The .30-06 had become well entrenched in Africa, and its 220gr load at 2400fps made it a good bushveld cartridge. The .338 Win Mag's velocity was a bit high for bushveld use, hence it suffered from bullet failure. Some were afraid its recoil would be excessive. Many regarded the .338 as needlessly powerful for non-dangerous game, and since it was not legal for use on dangerous game in most countries, it rather fell on barren ground. A pity, for it is more effective than any of the .30-calibres for long range use on large game like gemsbuck and kudu. Given time to slow down, even conventional bullets perform well, and now that we have really strong premium grade bullets, it also works very well as a bushveld cartridge, so it is a good all-terrain cartridge. If I still lived in Namibia, where most shots are long shots, and I was forced to choose one rifle for everything, it would be a .338 Winchester Magnum. Improved powders have recently enabled Federal to bring out a 'High Energy' load which pushes the .338 Win Mag's velocity to 2800fps with 250gr bullets, making it a real flat shooter. To get the best out of it, however, you must use 250gr bullets. There is absolutely no point in using the 225gr load – you would be better off using a .300 Win Mag with 220gr bullets, which have higher sectional density.

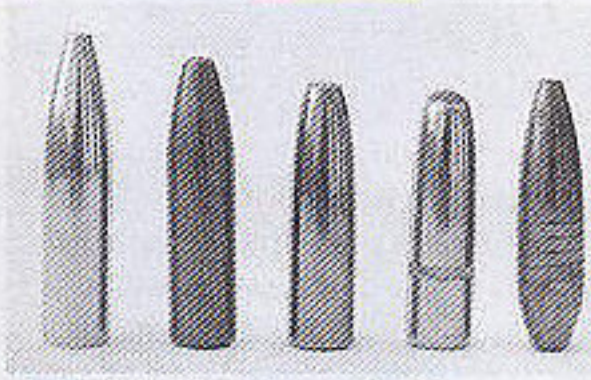


Author with zebra shot with .338 Sabi.

The advent of the .338 Win Mag brought the mass production of .338 bullets, and this was the death knell for the .333 wildcats. Immediately, wildcatters necked the .30-06 case up to .338, producing the .338-06, one of the most successful wildcats ever. It fires a 250gr bullet at 2370fps and a 275gr bullet at about 2275fps, and is, for all practical purposes, an American .318 Westley Richards. It was recently adopted as a factory cartridge and American rifle makers are now chambering it. An article on the .338-06 appeared in our December '99 edition, and a field report on it appears in *Gallery* of this edition.

It did not take Roy Weatherby long to climb on the .338 bandwagon, and in 1962 the .340 Weatherby appeared. True to form, Roy wanted a couple of hundred extra feet per second over the .338 Win Mag, and to get this he had to use a longer case, requiring a magnum length action. Original advertised velocity for the 250gr bullet was 2850fps, but nowadays it is being advertised as 2900 and even 3000fps. Initially it suffered from bullet failure, but modern premium grade bullets have solved this. Recoil is severe, however.

Recent years have seen a rash of superfast .338s appear, and I can think of little justification for any of them. I see no point in taking velocities higher than those of the .340 Weatherby. The .330 Dakota fires a 250gr bullet at 2900fps, which is still reasonable, but merely duplicates the .340 Weatherby ballistics in a short case, permitting standard length bolt actions. The .338 Remington Ultra-Mag also does 2900fps, its only claim to fame being a beltless case. The .338 Lapua (Finland) was designed as a sniper cartridge but has been adapted for hunting; it pushes the velocity up to 2963fps. Weatherby re-entered the field with a second .338 called the .338-378 Weatherby (yes, .378 case necked down) which takes the 250gr bullet to 3060fps. The .338 A-Square takes it up to 3120; the .338 Excalibur to 3250; the .338 Lazzeroni Titan to 3300 if the adverts are to be believed (these are all factory cartridges, by the way, not wildcats). The whole thing has become a silly race – a 'beanfield' war. Very long barrels are required to achieve these velocities, and heavy rifles to absorb the recoil.



.338 bullets, L-R: Barnes-X; Rhino; Woodleigh; Hornady and GS Custom. All weigh 250gr except the GS which is 180gr.

Let's come back to earth. A few years ago, Fanie and Eugene Combrink of Magnum Arms (Nelspruit) developed the .338 Sabi, for which they manufacture and market ammunition, making this a South African factory cartridge (see our November '95 edition). It fires a 250gr bullet at 2350fps, duplicating the ballistics of the .318 Westley Richards and the .338-06. It is based on a blown-out .30-06 case, so it has a bigger powder capacity than the .338-06, affording lower operating pressures.

When I first tested the .338 Sabi, I used ordinary Hornady softnose bullets to shoot a zebra standing broadside at 135m. The bullet smashed through the centre of its spine and exited in one piece, leaving a hole about the size of a R2.00 coin. The zebra was not yet dead when I approached, so I shot it again in the brisket from a distance of only *one metre;* the bullet was recovered in one piece having retained 70% of its weight. You can't ask for more than that. Meat damage from both shots was negligible.

I was so impressed that I had a very lightweight, compact bushveld rifle built in this calibre a couple of years ago, and although I have not managed to do much hunting with it yet, I love it. I have not bothered to develop different loads; the original .318 Westley Richards formula of a 250gr bullet at 2350fps has worked marvellously for nearly 100 years – why change it? This can be achieved with 55gr of S365, and I have never had any pressure problems. I have heard of some shooters getting pressure signs with this load, but Fanie Combrink tells me that switching to a 'duplex' load combining 20gr S385 with 37gr S365 solves any such problems.

My rifle shoots minute of angle groups with 250gr Woodleigh and Hornady bullets, and I fired just one group with 250gr Rhino bullets which had four shots within an inch – the fifth one that opened the group was a called pulled shot. Just out of interest, I tried the 250gr Barnes-X bullet, but it did not group quite as tightly as the others. However, the whole point of the .338 Sabi is that you don't need premium grade bullets – it gets outstanding performance with conventional bullets. Interestingly, GS Custom (Port Elizabeth) have designed a bullet especially for the .338 Sabi – a 180gr lathe-turned monolithic hollowpoint (see *Gallery* in this edition).

And now we have come the full circle: Kynoch is making .318 WR and .333 Jeffery ammunition again. Stewart's Gunsmithing Supplies (Pietersburg) makes cases and bullets for both these cartridges, and OPM Ammunition of Johannesburg makes the ammunition. So if you have one of these old rifles, get it shooting again – you cannot do better for hunting the large antelope of Africa.