

Nitro Express

The Big Bang of the Big Bang

By Terry Wieland

In the world of rifles and shotguns, progress comes mostly in small increments. It is rare to pinpoint the exact date when a momentous change occurred, but those great old British Nitro Express cartridges are the rare exception.



TOP: The .500 Nitro Express cartridge.
BELOW: The .450 Nitro Express cartridge.



The era of the nitro express began in July, 1898, when John Rigby & Co. unveiled the .450 Nitro Express, and ushered in the modern age of the elephant gun.

Although the introduction of the .450 was a specific event, and the cartridge was quickly accepted and changed the hunting world almost overnight, it was not the product of a single inspiration. Rather, it was the end result of a number of changes that had been taking place over the course of the previous 50 years – the development of the breechloading rifle, the perfecting of rifling techniques, the evolution of the brass cartridge case and the jacketed bullet, and most important, the development of

smokeless gunpowder.

Of course, necessity is always the mother of invention, and the technical aspects aside, the main impetus behind the development of the .450 and its offspring was the fact that British hunters were going out to Africa to hunt dangerous animals, and not all of them were coming back. Given the intense competition among British gunmakers in the latter half of the 19th century, and their dismay at losing customers (either to each other or on the horns of a buffalo), it is not surprising that firms such as Rigby, Holland & Holland, and James Purdey were all busy trying to perfect more effective rifles and cartridges.

Although southern Africa had been colonised since 1648, the modern era of big-game safari hunting is relatively recent. It began in 1836 when William Cornwallis Harris mounted a four-month safari into the interior from the Cape, and returned home to write an account of his adventures. The Wild Sports of southern Africa was a sensation. It inspired others to follow in Harris's footsteps, and from that time forward the exploration of the Dark Continent was inextricably tied up with big-game hunting. Sometimes it was hard to tell which was which.

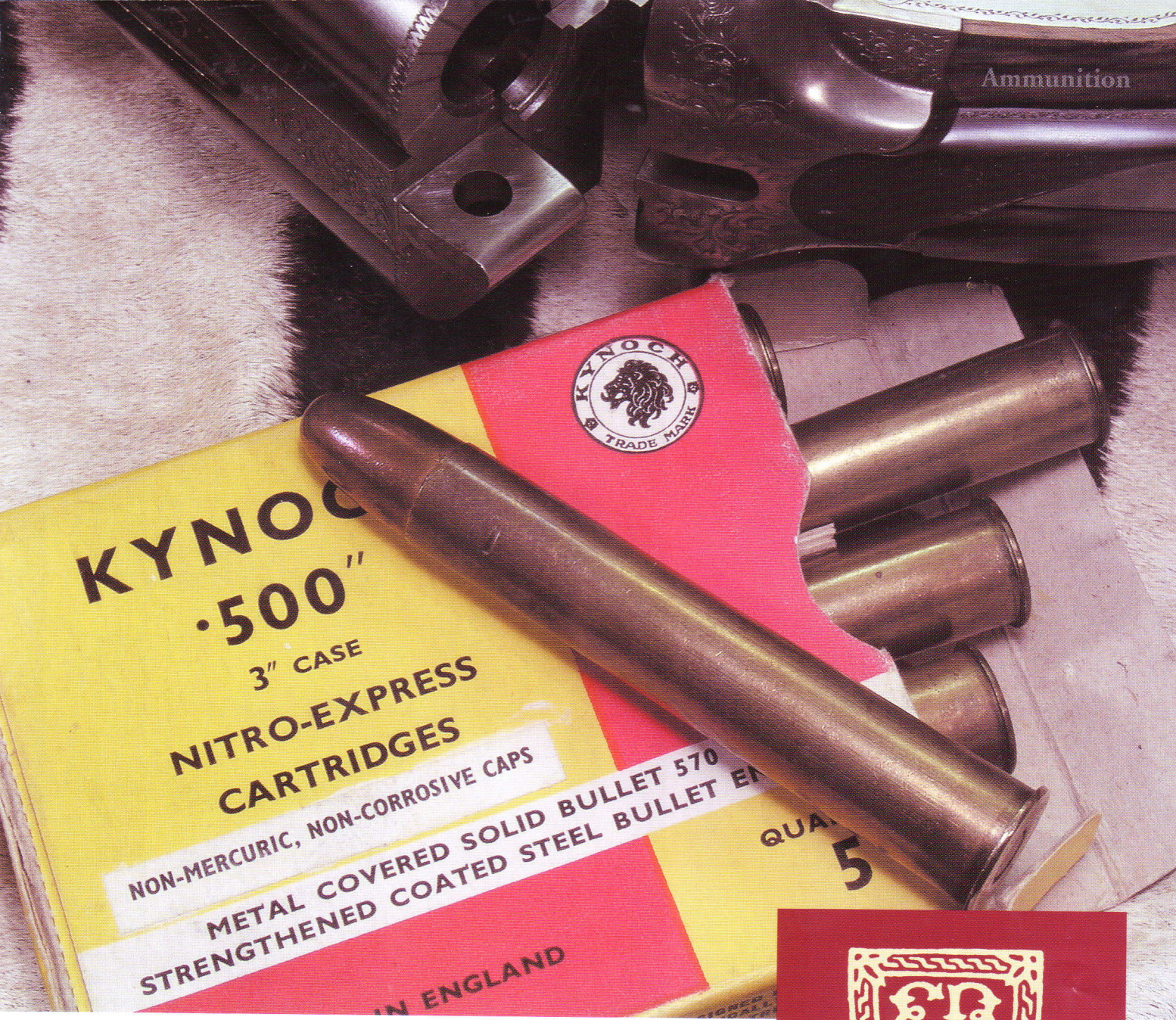
Some of the greatest names in hunting headed for Africa after 1840: Samuel Baker, William Cotton Oswell, the inimitable Roualeyn Gordon Cumming, and Frederick Courteney Selous. Many of these men also wrote about their exploits, and each new book inspired still more hunters to head south. Almost to a man, before boarding ship for the Cape, they would visit their favourite London gunmaker and order the tools

necessary for the job.

While famous primarily for their shotguns (this was also the era of the fabulous shooting parties, gunning driven grouse and partridges in England and Scotland), the British gunmakers were well accustomed to outfitting big-game hunters. For more than a century, soldiers and administrators by the thousands had been sailing for India and colonies in the far east, where they hunted tigers, elephant, rhinoceros, and various buffalo. It was through use in India that the double rifle had really been perfected.

Demanding as this game was, however, it was neither as plentiful nor as purely dangerous as the wildlife of Africa. The Cape buffalo was tougher, more truculent, and deadlier than any Asian wild ox; the rhinos were bigger, and lions and leopards were widespread and threatening to both man and beast. But it was the African elephant – huge, aggressive, numbering in the millions, and possessing a very valuable set of tusks – that both defined African hunting and set new standards for rifles. In 1850, there were several million elephants roaming the continent. There were many reasons for hunting them: to make room for settlement, to eliminate a threat to crops and people, and for their valuable ivory. Whatever the motivation, however, you needed a good rifle if you wanted to come back alive.

At first, the elephant hunter's standard firearm was a large-bore muzzle-loader, typically four- or eight-bore (using shotgun terminology) firing a lead ball weighing several ounces. This was a short-range weapon, but then elephant hunting is a short-range proposition. As breechloaders were refined, and centrefire technology was perfected,



The famous .500 Nitro Express cartridges.

the gunmakers developed cartridges like the .577 and .500 Express. With blackpowder and lead bullets, however, these were suitable only for the big cats and large antelope, not for elephant and the like.

Generally, blackpowder elephant guns were classified like shotguns, with bore diameter equated to the diameter of a lead ball, numbering so many to the pound. A 12-bore (12-gauge) is .729 inches, the same as a lead sphere weighing one-twelfth of a pound. A 24-bore (24 balls to the pound) is .577 diameter, and the .577 has been a standard bore all along, from muzzleloader days, through the early breechloaders, and is still made today as the .577 Nitro Express.

The term “express”, when applied to cartridges, was derived from the fast trains that transformed travel in the late 1800s. James Purdey applied it to one of that company’s small-bore blackpowder cartridges, to emphasise its high velocity. Soon the name was being attached to any high-velocity cartridge. When smokeless powder replaced

blackpowder, the word “nitro” was added, denoting the nitrocellulose and nitroglycerin base of the new propellant. In technical terms, “Nitro Express” means “smokeless and fast” and by the standards of the day, they certainly were.

In the breechloading blackpowder era, several calibres became standard. The .577 was one; others included the .400, .450, and .500. Not surprisingly, although there were perhaps a dozen different cartridges, there was only a handful of basic cartridge cases from which they were formed. For example, there was both a .500 Express and a .577/500; the latter was a .577 case necked down to .500. There was a .450 Express, and a .450/400. It was simpler for all concerned to start with one basic case with standard head dimensions and work from there. Why reinvent the wheel? This is an important principle to remember as we move into the era of the big Nitro Express cartridges, because it explains much of what happened later.

Rigby’s .450 NE was an instant sensation, and





CENTRAL-FIRE METALLIC AMMUNITION

·45-70-405 MARLIN AND WINCHESTER

For repeating and single-shot rifles, etc. (in boxes of 20).



57 grs. Black powder, 405 gr. Lead, Solid bullet.

·450 NITRO-EXPRESS

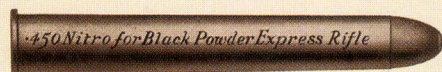
For sporting rifles (in boxes of 5 and parcels of 50). Length of case, 3 1/4".



70 grs. Smokeless powder, 480 gr. Metal-covered, Solid, Soft-nosed, Split or Westley Richards' Capped bullet.

·450 NITRO

For BLACK POWDER Express rifles (in boxes of 5 and parcels of 50). Length of case, 3 1/4".



52 grs. Smokeless powder, 365 gr. Metal-based, Solid or Copper-tubed bullet.

·450 BLACK POWDER EXPRESS

For sporting rifles (in boxes of 5 and parcels of 50). Length of case, 3 1/4".



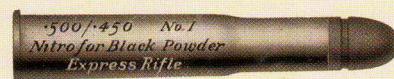
120 grs. Black powder, 270 gr. Lead, Copper-tubed bullet.
120 grs. Black powder, 310 gr. Lead, Solid bullet.
120 grs. Black powder, 325 gr. Lead, Copper-tubed bullet.
120 grs. Black powder, 365 gr. Lead, Solid bullet.



CENTRAL-FIRE METALLIC AMMUNITION

·500/.450 No. 1 NITRO

For BLACK POWDER Express rifles (in boxes of 5 and parcels of 50). Length of case, 2 1/4".

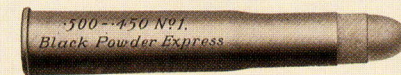


42 grs. Smokeless powder, 365 gr. Metal-based, Solid or Copper-tubed bullet.

(Not in production—available only while stocks last.)

·500/.450 No. 1 BLACK POWDER EXPRESS

For sporting rifles (in boxes of 5 and parcels of 50). Length of case, 2 1/4".



110 grs. Black powder, 270 gr. Lead, Copper-tubed bullet.

110 grs. Black powder, 310 gr. Lead, Solid bullet.

·500/.450 MAGNUM NITRO-EXPRESS

For sporting rifles (in boxes of 5 and parcels of 50). Length of case, 3 1/4".



75 grs. Smokeless powder, 480 gr. Metal-covered, Solid, Soft-nosed, Split or Westley Richards' Capped bullet.

its ballistics became the standard by which all others would be – and to a great extent still are – judged. The .450 fires a 480-grain bullet at 2150 feet per second, for a muzzle energy of 4930 foot/pounds. The case is straight, slightly tapered, with a rim. Originally, it had been a blackpowder cartridge, but with cordite powder (the traditional English double-base smokeless powder extruded into long strands, hence the name) the ballistics were transformed. This was a rifle that, as John Taylor wrote 50 years later, would “handle any animal under any conditions”. The day of the single-shot blackpowder behemoth was over.

Some of the great British gunmakers specialised in shotguns (Purdey, for example) while others (Rigby, Westley Richards, Jeffery) were primarily riflemakers. Holland & Holland was famous for both. When Rigby announced their .450, H&H quickly produced a cartridge of its own: the .500/450 Nitro Express. Not a great deal of work was required, since the cartridge actually originated around 1880 as a blackpowder round. It was based on the .500 straight, rimmed case, necked down to .450. Ballistically, it was the twin of the Rigby cartridge, although the slightly roomier case did the work with a tad less pressure.

The real significance lies in the fact that the .500/.450 originated with the .500 case.

As we have seen, the .500 Express was a blackpowder round, popular in India for hunting

tigers, but not so widely used in Africa. It was seriously underpowered for elephant. It used a straight, rimmed case 3 1/2" long.

As the Nitro Express concept took hold, someone (and no one now has any idea who) took the old blackpowder round, loaded it with cordite and a 570-grain bullet, and called it the .500 Nitro Express. Around the same time, someone else did likewise with the old .577 blackpowder round. Suddenly, there were three distinct power levels to be had in a cordite elephant rifle: the .450s, at around 5 000 ft.lbs. energy, the .500 at close to 6 000, and the .577 NE with a 750-grain bullet at 7 000 ft.lbs.

As you can imagine, the .577 was not for everyone. Rifles weighed about 14 pounds, and even then the recoil was pretty fearsome. The .577 became, and remained, the tool of the professional elephant hunter, for use in special circumstances. The huge case was never really used as the basis for any other cordite rounds, mainly because a better alternative existed: the .500.

When the .500 was established as a smokeless round, two versions emerged – one with a 3" case, the other 3 1/2". The three-inch case became dominant, and probably 90 percent of all .500 NE rifles are chambered for it. Three-inch-case ammunition can be used in the longer chamber, but of course, not the reverse.

During this time, many British cartridges were

proprietary, which is to say that only the inventing gunmaker offered them, and you purchased your ammunition from him. Regardless of the name on the box, however, most ammunition was made by Eley Brothers or Kynoch, which later merged to become Eley-Kynoch. Non-proprietary cartridges were available direct from the ammunition makers.

The transition from blackpowder to smokeless was not without problems. Not all the existing cases could safely be loaded with cordite. The brass on many of them was paper-thin, because blackpowder generates far lower pressures. Subjected to the greater pressure of nitro loads, the cases tended to stick in the chambers. This problem was overcome largely by making them from heavier brass.

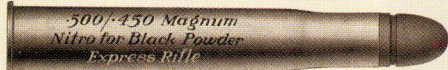
In early 1903, however, Eley Brothers decided to introduce a cartridge themselves (a rare occurrence, since most were developed by rifle makers) and release it to the trade, to be chambered by anyone who wished. The new cartridge was the .450 No. 2 Nitro Express, so named to differentiate it from the popular Rigby round. The .450 No. 2 was a completely new creation. It had a thicker rim, heavier walls, and was long and massive. In spite of its impressive appearance, the new round's ballistic performance mirrored the existing .450s. It did so, however, at lower pressures, and the new cartridge was



CENTRAL-FIRE METALLIC AMMUNITION

.500/.450 MAGNUM NITRO

For BLACK POWDER Express rifles (in boxes of 5 and parcels of 50). Length of case, 3¼".

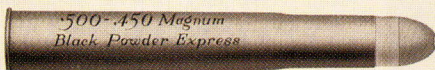


52 grs. Smokeless powder, 365 gr. Metal-based, Solid or Copper-tubed bullet.

(Not in production—available only while stocks last.)

.500/.450 MAGNUM BLACK POWDER EXPRESS

For sporting rifles (in boxes of 5 and parcels of 50). Length of case, 3¼".



140 grs. Black powder, 325 gr. Lead, Copper-tubed bullet.
140 grs. Black powder, 365 gr. Lead, Solid bullet.

.450 No. 2 NITRO-EXPRESS

For sporting rifles (in boxes of 5 and parcels of 50). Length of case, 3¼".



80 grs. Smokeless powder, 480 gr. Metal-covered, Solid, Soft-nosed, Split or Westley Richards' Capped bullet.

.500/.450 No. 2 MUSKET

For military and sporting rifles (in boxes of 10 and parcels of 100).



76 grs. Black powder, 480 gr. Lead, Solid bullet.
35 grs. Smokeless powder, 480 gr. Lead, Solid bullet.

(Not in production—available only while stocks last.)



CENTRAL-FIRE METALLIC AMMUNITION

.577/.450 SOLID MARTINI-HENRY

For military and sporting rifles (in boxes of 10 and parcels of 100).



85 grs. Black powder, 480 gr. Lead, Solid bullet.
90 grs. Black powder, 325 gr. Lead, Copper-tubed bullet.
38½ grs. Smokeless powder, 480 gr. Lead, Solid bullet.
44 grs. Smokeless powder, 365 gr. Metal-based, Solid or Copper-tubed bullet.

FOR CARBINES.

34 grs. Smokeless powder, 410 gr. Lead, Solid bullet.

.577/.450 COILED MARTINI-HENRY

For military and sporting rifles (in packets of 10 and parcels of 100).



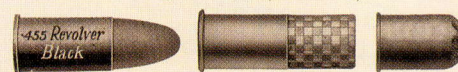
85 grs. Black powder, 480 gr. Lead, Solid bullet.
90 grs. Black powder, 325 gr. Lead, Copper-tubed bullet.

FOR CARBINES.

70 grs. Black powder, 410 gr. Lead, Solid bullet.

.455 REVOLVER

For British Service Webley revolvers, etc. (in boxes of 50).



18 grs. Black powder, 265 gr. Lead, Solid bullet.
Also supplied as Shot or Blank cartridges.



4 grs. Smokeless powder, 265 gr. Lead, Solid bullet.

impervious to case-sticking.

The same year, the riflemaker W.J. Jeffery decided to go everyone one better, and introduce a new cartridge that would be the last word in power. The .600 Nitro Express, like the .450 No. 2, was a completely original creation, not based on any blackpowder round. It fired a 900-grain bullet at 1 950 fps, for a muzzle energy of 7 600 ft.lbs. It was, and remained for half a century, the most powerful sporting cartridge made.

With all the bases seemingly covered, probably there would have been few additional developments in the Nitro Express universe. Around 1907, however, political events intervened. There was an uprising in India, and unrest in the Sudan. There were still tens of thousands of .450 Martini-Henry rifles floating around. To prevent insurgents obtaining ammunition, the British government banned all .450-calibre rifles in both regions. Obviously, none of the sporting cartridges could be jammed into a Martini-Henry chamber, but the bullets could be pulled and reloaded, so the edict is not completely ludicrous by government standards.

India, of course, was a major market for big rifles. No longer allowed to sell .450s, the English gunmakers began casting about for alternatives.

The .600 and .577 NE were really suitable only for African elephant, and even the .500 NE was too powerful for general use. What they needed

were cartridges that would deliver the ballistics of the .450 NE, with reasonable recoil in a ten-pound rifle. Halfway between .450 and .500 is .475, and that is what most of them settled on.

The most convenient approach was to take the .500 and neck it down. Westley Richards created the .476 NE from the 3" case, while H&H created the .500/.465 from the 3½" case. Joseph Lang did likewise, and created the great .470 NE. Someone else – no one knows who – created the .475 NE, a straight, rimmed case very similar to Rigby's .450. Finally, Eley necked up their .450 No. 2 and created the .475 No. 2.

Since 1907, many gunmakers have merged or gone out of business, and their records have been lost or destroyed, so exact details of how, when, and by whom every cartridge was introduced are not always available. It is generally believed, however, that all the big Nitro Express cartridges were introduced between 1898 and about 1908 – a decade of innovation unlike any other in rifle history.

Very quickly thereafter, the Mauser bolt-action rifle began to gain a following. The Mauser 98, perfected the same year as Rigby's .450, was the first bolt action really suitable for cartridges capable of downing an elephant. It would take many years for the bolt action to displace the big double as the rifle of choice, especially for professionals, but the gunmakers saw its potential

early. The next wave of cartridge innovation, beginning around 1910, saw the creation of the most famous rimless cartridges for magazine rifles, including the .375 H&H, the .416 Rigby, and the .404 Jeffery.

More than a century has passed since the Nitro Express era began, and there have been huge changes in every aspect of ballistic performance. On paper, the .450 NE now looks decidedly old hat. All kinds of newer cartridges, both larger and smaller in bore diameter, deliver performance that eclipses the .450 and everything in the .470 class. But appearances can be deceiving.

The British gunmakers of 1900 knew a great deal, not only about making rifles, but also about the problems of maintaining a rifle in the tropics. In hunting dangerous game, reliability was everything. It still is. A rifle must perform perfectly shot after shot; in a colony, far from London and a competent gunsmith, it also must perform year after year with a minimum of professional servicing. A London "best" double rifle, by Rigby or H&H, was built to perform flawlessly under the harshest conditions.

The cartridges for which they were chambered played a large part in this reliability. Features that are sometimes sneered at by the uninformed were, in fact, advantages. And, if you are hunting a wounded elephant under a tropical sun, they still are today, a hundred years later.

Ammunition



For example, it is often pointed out that a cartridge like the .416 Remington delivers higher muzzle energy than the .450 NE, and does so in a smaller, more efficient cartridge.

Under ideal conditions, that is true, but it does so at a price – a price that few Professional Hunters would want to pay. Unlike the Nitro Express cartridges, these modern high-performance, high-intensity creations are small, have almost parallel sides, and operate at vastly higher pressures. In tropical heat, they are unforgiving, and a bolt action can jam solid leaving the hunter essentially unarmed.

All the Nitro Express cartridges, on the other hand, are big and roomy, which means lower operating pressures. At the same time, they have a noticeable taper, which almost eliminates jamming regardless of how the pressure might peak in the heat. The greatest of the magazine cartridges, the .375 H&H, shares this trait, and jams with the .375 are almost unknown.

This was especially important in double rifles, which do not have the camming power of a bolt to extract a stuck case, but the principle is sound regardless of the type of rifle.

There are about a dozen important Nitro Express cartridges. In the coming issues, we will look at the major offerings individually – their history, who used them, how useful they are today, and where you can obtain both rifles and ammunition. We will begin next issue with the most popular of them all, the .470 Nitro Express.