

The **Rifle**
Magazine

Number 8
March-April 1970

U.S. & Canada, \$1.00
Foreign, \$1.25

The Trapdoor Springfield

**Weatherby's
.270 Magnum**

Trigger Tuning

Black Powder Slug Rifles



The **Rifle** Magazine

'Only Accurate Rifles Are Interesting'
- Col. Townsend Whelen

Volume 2, Number 2
March-April 1970

In This Issue

NRA Executive Dies	Neal Knox	7
The Trapdoor Springfields	Al Miller	14
A Different History Of The .222 Mag.	Edward C. Ezell, Ph.D	18
The New Mannlicher	Maj. George Nonte	22
Trigger Tuning	Roy Dunlap	26
Don't Knock Air Guns!	Neal Knox	28
The Lyman Story, Part II	Ken Waters	30
Black Powder -- Bench Style	Jim Carmichel	32
More On Momentum	Robert J. Fritz	37
Working With The .270 Weatherby	Don Zutz	38

Departments

Dear Editor	5
Editorial	6
Muzzle Flashes	8
Loading For Bear11
Aiming For Answers59
Book Review60
Product Proofing61
Bench Report65
Just Jim74

Adopted in August 1969 as Official Publication
For National Bench Rest Shooters Association



The RIFLE Magazine is published bi-monthly by Dave Wolfe Publishing Co., Rt. 4, Box 3482 (1406 Hendryx Place), Peoria, Illinois 61614. Telephone (309) 691-2169. Second Class Postage paid at Peoria, Illinois, and additional mailing offices. Single copy price of current issues -- \$1.00 Subscription price: six issues \$5.00; 12 issues \$9.00; 18 issues \$12.50 (Outside U.S. possessions and Canada -- \$6.00, \$11.00 and \$15.50). Recommended foreign single copy price \$1.25. Advertising rates furnished on request. All rights reserved.

Publisher of The RIFLE is not responsible for mishaps of any nature which might occur from use of published data, or from recommendations by any member of The Staff. No part of this publication may be reproduced without written permission from the editor. Manuscripts from free-lance writers must be accompanied by stamped self-addressed envelope and the publisher cannot accept responsibility for lost or mutilated manuscripts.

Change of address: Please give one month's notice. Send both old and new address, plus mailing label if possible, to Circulation Dept., The RIFLE Magazine, Rt. 4 - Box 3482 (1406 Hendryx Place), Peoria, Illinois 61614.

Cover

The Trapdoor Springfield, first standard U.S. Army breechloading rifle and last to use black powder, had a long and sometimes checkered career, outlined and defended by Al Miller on page 14 of this issue. Color transparency by W. T. Willis.

The Staff

Dave Wolte, *Publisher* -- Neal Knox, *Editor*

Jim Carmichel, <i>Associate Editor</i>	Norm Lammers, <i>Tech. Adviser</i>
John Wootters, <i>Associate Editor</i>	Maj. George C. Nonte, <i>Military</i>
R. T. Wolfe, Ph.D., <i>Associate Editor</i>	Ken Waters, <i>General Assignment</i>
Parker O. Ackley, <i>Wildcats</i>	Edward M. Yard, <i>Ballistics</i>
John Buhmiller, <i>African Rifles</i>	Don Zutz, <i>General Assignment</i>
Harvey Donaldson, <i>Historical</i>	Rod Guthrie, <i>Staff Artist</i>
Roy Dunlap, <i>Gunsmithing</i>	Barbara Hansen, <i>Data Processing</i>
Edward C. Ezell, Ph.D., <i>Technology</i>	Judith MacDonald, <i>Ed. Assistant</i>
Jim Gilmore, <i>Bench Report Editor</i>	Barbara Killough, <i>Ad. Director</i>
Bob Hagel, <i>Hunting</i>	June Skillestad, <i>Circulation Manager</i>

The RIFLE Magazine

LOADING for BEAR ...and other Critters by John Wootters

MOST INSTALMENTS of this column start out with a description of some experience which illustrates the point to be made. This one, however, will not, for the simple reason that I have never had the failure of a brass cartridge case ruin a shot or a trip while hunting. And the reason for that is that I have never taken any chances with cases intended for use in the field.

The brass case, being the only reloading component which is reused, is the only one subject to failure as a result of earlier treatment or mistreatment by the handloader. All other components are essentially in new condition during their first - and last - firing. My fundamental precaution against failure in the field is to use only brass which is new or at least in "mint" condition when building hunting loads. In certain rifles, the ideal case for a hunting cartridge is one which has been fired once in that rifle's chamber with a moderately stiff load and which has then been neck-sized only.

One very rarely finds factory-new brass with defects, but it can happen. I've had a number of brand-new cases develop body-splits on first firing, and a few others which were incorrectly annealed during manufacture show excessive expansion and enlarged primer pockets after one firing with moderate loads. This is why I prefer once-fired brass to brand-new for hunting loads; that first firing usually reveals the defective cases, and, although new brass of any reputable brand won't show one bad case in a thousand (or maybe ten thousand), one is enough. I remember getting three body splits on the first firing of one box of unprimed brass - three defective cases out of twenty. Any one of those three might have cost me a head of big game at long range, and I prefer better odds than those.

Many rifles will not accept neck-sized-only brass, however. Those chambered for bottlenecked, belted cartridges are particularly troublesome in this respect, being rather sloppy in the shoulder area of the chamber, in

March-April 1970

many cases. Since the rounds headspace on the belt, shoulder dimensions are not so critical in such chambers and manufacturers apparently cut them a trifle generous in the shoulder region to insure smooth chambering of factory ammunition. In such arms, the case expands forward at the shoulder on first firing and, if neck-sized only during reloading, tend to chamber quite tightly, maybe enough so as to make it impossible to rack the bolt swiftly for a second shot with the rifle still at the shoulder.

Rifles with eccentric chambers - more or less egg-shaped in cross-section - create similar problems with neck-sized-only brass unless the once-fired case happens to enter the chamber in perfect alignment. Such guns are far more common than you might suspect, although really extreme cases of chamber eccentricity are rare today.

An arm with either of these problems or any of several others may require full-length resizing after each firing to produce ammo which feeds and chambers perfectly. Even so, once-fired brass is still preferable to brand-new cases for the reasons outlined above. However, I choose not to use such brass more than once for hunting reloads. I have found it frankly impossible to predict the effect upon brass of multiple resizings (full-length); too much depends upon such variables as the relative dimensions of the rifle's chamber and those of the loading dies used.

In experimental firing on the range I've had many cases separate (both belted and rimless) in the gun's chamber, apparently due to a few full-length sizings. This is as apt to be true with fairly mild, normal loadings as with hot ones. I am aware of tests which have been run, tending to prove that repeated full-length sizings do not weaken a case, but I've also had cases turn loose after as few as three sizings and firings. The result is almost invariably a rifle which is out of

new FORMULA



PERMA BLUE
PASTE
GUN BLUE



FOR
TOUCH-UP
OR
COMPLETE
REBLUEING

\$150

NET WEIGHT 2.02

BIRCHWOOD CASEY COMPANY, EDEN PRAIRIE, MINN. 55343

PERMA BLUE PASTE GUN BLUE OUTPERFORMS ALL OTHERS

... in durability

Three coats of new formula PERMA BLUE PASTE GUN BLUE outlasted 8,000 cycles of laboratory abrasion tests. Three coats of competitive products failed at 1,000 cycles.

... in ease of use

Gel-like PERMA BLUE PASTE has controlled action that really works. Spreads evenly direct from tube, blends perfectly for touch-up. Apply, wipe off in 30 seconds, buff lightly with steel wool. No heating or rinsing needed.

... in beauty of finish

PERMA BLUE PASTE produces deep, lustrous blue-black color coat after coat because the acid content is adjusted so that each successive coat does not remove the blue previously laid down.

No wonder PERMA BLUE PASTE GUN BLUE is preferred by men who know guns best. No better product ... no better price.



BIRCHWOOD CASEY

7900 FULLER ROAD
EDEN PRAIRIE,
MINNESOTA 55343

DIVISION OF
FULLER LABORATORIES, INC.

commission until it can be taken to a gunsmith, and I've hunted too many places where the nearest gunsmith was a couple of days' travel distance to make me happy with the thought.

There are other problems which can arise from using many-times-fired brass. One is elongated necks. Certain cartridges are much more prone to such trouble than others, and certain rifles may give more trouble than others, even in the same chambering. Of course, you *should* keep close track of case length

and trim when necessary, but not everyone is that careful. In any case, the consistent use of cases which have been fired only once will eliminate the possibility of overlong necks.

Another possible trouble with tired cases arises from deformed rims. Rims can be nicked, upset, or battered into uselessness in various models of rifles, and also in certain of the "universal" shellholders for reloading presses. I recall a couple of .350 Magnum cases whose rims were so deformed in a

shellholder with moving jaws that the bolt of the rifle would not close on them. Those rounds were intended for a jaguar hunt in Mexico, and they could have given me a nasty surprise in dealing with a wounded jaguar in close quarters!

Expanded primer pockets should, in themselves, never create problems in the field, for the simple reason that such cases should be discarded when discovered. Still, they're far less likely to appear in once-fired cases than in those which have been used repeatedly, especially for load development in the process of which maximum loadings have been established (and frequently exceeded). Yet, believe it or not, I have seen a man's rifle fail to fire in the hunting field because the primer had fallen out of its pocket between the magazine and the chamber!

I doubt, however, whether such a reloader is likely to be a regular reader of this magazine. It must be admitted, too, that a primer pocket can be enlarged to the point of danger in only one firing, if the powder charge is excessive. To avoid such things, my own practice is to work my loads up in old brass (of the same brand, of course). Then, with the load established, I put together ammunition using virgin, or at most, once-fired brass and use this for final zeroing of the rifle and/or practice shooting. Finally, I trim, chamber, resize, and load this brass for the hunting season and keep it segregated from all other cases in that caliber.

Since, for big game, I almost never load more than 20 rounds of hunting ammunition in a year, the cost of new brass is completely negligible compared to the costs of hunting, especially when, after it has been used for the field, I retire it for more prosaic uses and eventually get the benefit of its full useful reloading life. After all, I may not fire a dozen rounds a year at all species of big game combined, whereas I commonly fire thousands of reloads per annum in experimental shooting, plinking and practice.

If, in an emergency when all the stores are closed, I have no choice but to use several-times-fired brass for hunting loads, I'm thankful for my reloading records-keeping system which allows me to select the "youngest" brass I have on hand in any given chamber. Even then, these cases receive the most careful inspection and those about which I have the slightest doubt are not used for hunting reloads.

The RIFLE Magazine

Magazines & Books

The Rifle Magazine
Jan.-Feb., 1969
Number 1

Features:
Bill Ruger's Classic 77
Trajectory Calculation
Inside The M-16
My First Chuck Rifle
Starting Your Shop
The New Law & You

The Handloader Magazine
Number 19
May-June, 1969

Features:
270 Wildcats
Analysis of DWM Brass
On Revolver Conversions
Far Reach Shotshell Loads
Pressure Factors - Part VI
Handloading the BAR Magnum

RIFLE MAGAZINE — All back issues available at \$1.50 each.

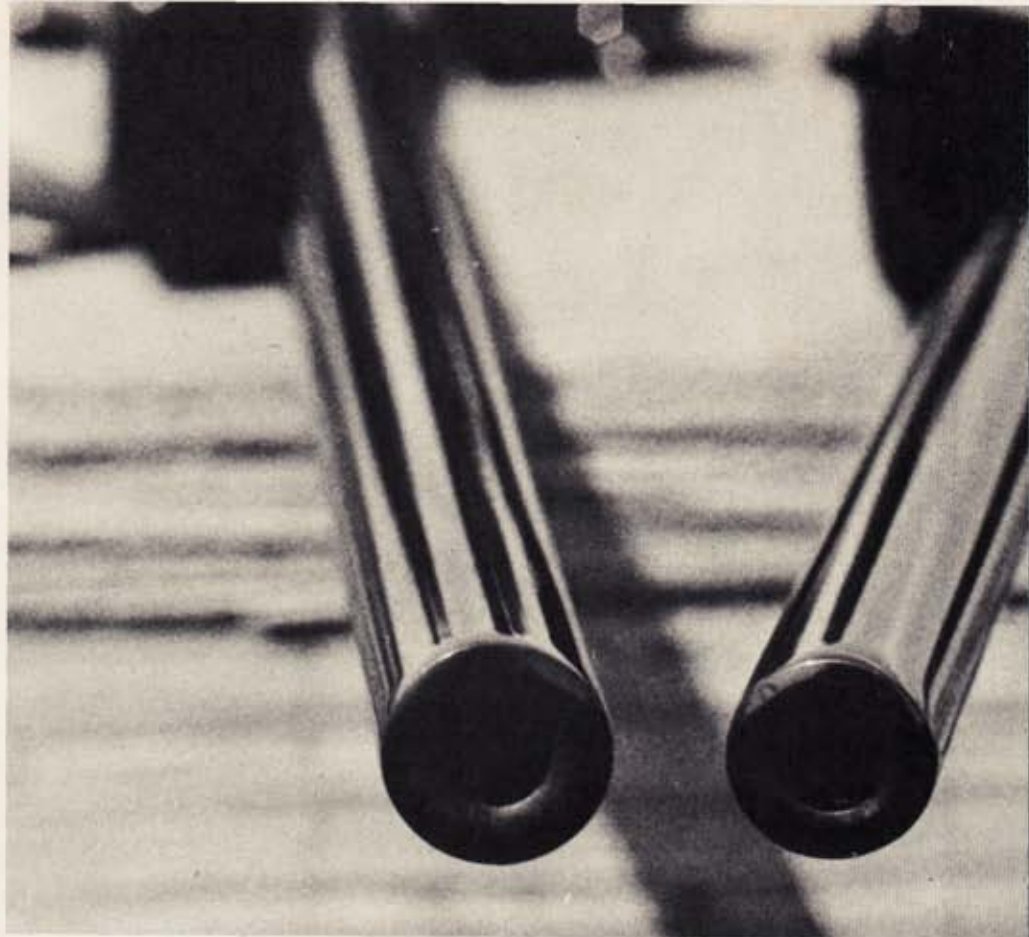
HANDLOADER MAGAZINE
-- We have all back issues except No. 19. Limited supply of Nos. 2 and 4 at \$5.00 each. Numbers 1, 3, 7, 8, and 15 at \$3.00 each. All other issues (except 19) at \$1.50 each.

Fill in your complete sets of all gun magazines while issues still exist. We have back issues of most firearms publications. Send stamped, self-addressed envelope for Price Sheet No. 10.

PADCO Enterprises

Post Office Box 3203 Peoria, Illinois 61614

Working With The .270 Weatherby



By DON ZUTZ

ALTHOUGH WE ARE SWAMPED by a multitude of commercially drawn cartridges for the likes of 7mm and .30 caliber projectiles, only two factory forms are available for the .277-inch bore. These, of course, are the standard .270 Winchester and the .270 Weatherby Magnum.

The reason for this scant inventory seems attributable to the fact that the .270 WCF, which came on the market back in 1925, is based on a pretty versatile brass bucket. For this venerable Winchester .270 — a necked down .30-06 case with its neck stretched a mite — has ample powder capacity and bullet weight for many heavy jobs on big game, while it is also small enough of bore to handle varmint-sized missiles with stinging accuracy.

Indeed, anyone who doubts the versatility of a standard .270 WCF would do well to read the "In My

Experience . . ." department of the *American Rifleman* for January, 1969, in which a letter by Vernon E. Megee of Austin, Texas, provides a load table showing how the venerable .270 WCF can be charged to duplicate the practical field performance of everything from the .25 rimfire with its long-forgotten 67-grain bullet through the level of a .30-06 pushing 150 grainers. And if that isn't flexibility, what is?

But before I sing the praises of this old favorite too loud and too long, I'm forced to remember that this article is about the other .27 caliber cartridge — the .270 Weatherby Magnum. In fact, I can just about hear some gents demanding to know why, if I love the .270 WCF so danged much, I even bother about Weatherby's canister for the .277-inch bore.

Essentially, my interest in the .270 WM grew out of certain academic

considerations. The sectional densities and ballistic coefficients of .27 caliber hunting projectiles in the 130 to 150-grain class are extremely high, meaning that any increase in velocity beyond that already generated by the .270 WCF would be so much gravy for the western hunter. Trajectories out to 400 yards or so would flatten, and more energy would be delivered on a target across yon canyon.

Despite these theoretical advantages of a .27 caliber magnum, however, there were some questions in my mind: first, could the .270 Weatherby develop enough *extra* velocity to warrant the use of this magnumized canister and great gobs of propellant? The standard .270 WCF can already kick 130-grain bullets from the muzzle of a 22-inch sporter barrel somewhere around 3,100 fps, getting them there at the behest of approximately 61 grains of 4831 or 56 to 57 grains of 4350.

The photo at left compares the muzzle dimensions of the two .270 Weatherby Magnums used in the tests. The left barrel is a 26-inch No. 2 contour, with .596-inch muzzle; the one at right is a sharply tapered 24-inch tube with .537-inch muzzle.



These sectioned .270 Weatherby Magnum and .270 Winchester cases clearly show why the .270 WM will take 77.5 grains of 4831 to the base of the neck, while the standard .270 WCF requires only 57 grains of 4831 to fill to the same level.

Likewise, it is well known that large cases and heavy powder charges are more prone to ignition and combustion irregularities than are the smaller cartridges, meaning that accuracy can suffer in magnums because of inconsistent chamber pressures and bullet time down the bore. Thus, I also wondered if the .270 WM would give the accuracy needed for proper shot placement on distant targets.

To answer these questions to my own satisfaction, I worked with a factory-fresh pair of these .27 caliber cannons of Weatherby persuasion. One of said South Gate items had the popular 24-inch hunting barrel, and it started life with a Weaver K6 astride a Weaver top mount. This combination worked perfectly; but I later did some experimental switching, and the gun now wears a Redfield Jr. mount with a Leupold 3-9X variable. The other rifle sported a 26-inch tube with Weaver top

mounts and a Bushnell 3-9X "Scope Chief."

In all other respects, the rifles were practically identical, and both had some of the prettiest stocks I have laid my peepers on in many a moon. There was contrast and curl aplenty in the butt, with the stronger straight grain taking over through pistol grip and fore-end areas. At no time did I touch one sliver of barrel channel wood, and all accuracy testing was done with the rifles in factory condition.

My reloading was done with a set of Bair dies, although some groups shot with the 26-inch barrel were fired with loads turned out on an RCBS rig owned by a friend. Chronographing was done with a very accurate Oehler Model 10. All brass was original .270 Weatherby stuff, while primers were Federal's 215 Magnums, which I understand were designed especially with Weatherby cases in mind.

My range work was pointed specifically toward determining the accuracy potential of the .270 WM with loads generating the highest possible velocities consistent with safe pressures. The results of this experiment will be shown in the rather extensive load table I include with this article, but, before I draw any conclusions from that data, it is quite possible that some readers may be interested in the following observations I made while working with the .270 Weatherby:

For example, I now feel safe in stating that Weatherby rifles and Weatherby-loaded cartridges are the most accurate commercial combination I know of for the big game hunter. It has been my experience that most other makes of commercially loaded ammo and random rifles simply will not give really good accuracy when subjected to a stiff bench rest test. Indeed, my own .270 WCF, which does right smartly with homebrew, can't cut less than 3-inch clusters with most brands of factory fodder. Likewise, many other rifles can be listed as nearly worthless as varminters with commercial loads.

But Roy Weatherby claims his rifles in this category are tuned to produce at least 1½-inch groups before they leave the shop — and I believe him. Most of the .300 WM's I have shot in the past were capable of printing such groups



The wide range of bullets used in the tests include, from left, the 90-grain Sierra hollow point, 100-grain Speer Spitzer, 110-grain Sierra Spitzer, 130-grain Remington Bronze Point, 150-grain Hornady Spire Point, 160-grain Nosler semi-spitzer, and 170-grain Speer round nose.



The author conducted extensive velocity and accuracy tests with this pair of .270 Weatherby Magnum rifles, finding that the 26-inch barrel model in the background often gave less additional velocity over the 24-inch tube than is generally supposed - with one load giving less velocity in the longer barrel. All velocities were checked on the accurate Model 10 Oehler chronograph shown.

VELOCITY AND ACCURACY DATA FROM .270 WEATHERBY MAGNUMS

(Note: Testing was mainly done to determine whether accuracy could be maintained at the highest possible velocities consistent with safe pressures. Consequently, most of the following loads were maximum or near maximum for the rifles used, and they should be approached with caution when tried in other rifles chambered for the .270 Weatherby Magnum cartridge. All loads used the Federal 215 Magnum primer.)

Powder charge/type	Velocity		Remarks
	24"	26"	
Bullet: 90-grain Sierra			
76.0/780BR	3,600	3,650	2-3" groups.
76.0/4350	3,900	3,990	1 3/4" group through 24" tube.
67.0/4064	---	3,853	Accurate through cold barrel. First two shots within one inch, third normally wide of group.
Bullet: 100-grain Speer			
74.0/4350	3,735	3,795	1 1/2-inch spread through 26" barrel
75.0/780BR	3,669	3,629	Velocity loss in 26" tube; least accurate of 6 loads tested, several 3-inch groups to its credit.
65.0/RL-21	Not Chronographed		Light load estimated at 3,300-3,400; consistent groups of 1-1 1/2 inches.
69.5/RL-21	3,780	3,830	
66.0/4064	---	3,680	1 1/4" group through 26" barrel.
77.0/4831	---	3,625	2 1/2" group.
Bullet: 110-grain Sierra			
74.0/780BR	3,539	---	1 1/4" groups. First 2 shots normally within 3/4".
69.0/4350	3,270	---	Consistently throws 1" groups.
73.0/4350	3,642	3,663	Retains approximate accuracy of 69.0/4350/110 load with increased velocity.
65.0/4064	3,514	3,546	
66.5/RL-21	---	3,350	Light load; gives reasonable accuracy.
67.0/H414	---	3,539	
75.0/4831	3,475	---	
68.0/RL-21	3,649	3,665	
Bullet: 130-grain Remington Bronze Point			
68.0/4350	3,300	---	1" groups through 24" barrel.
69.5/4350	3,350	3,390	1 5/8" groups through 24" barrel.
71.0/780BR	---	3,225	2 1/2" groups.
72.0/780BR	---	3,270	Occasional 2" groups.

(Continued on opposite page)

with a certain weight bullet in Weatherby ammunition (probably the weight used to tune the rifle); and, burning 130-grain Weatherby loads through the 24-inch barrel, I cut a 1 5/8-inch spread the first time I shot that gun for accuracy. Later groups, also shot with Weatherby ammo, tightened that group by a quarter of an inch, which isn't bad big game accuracy for run-of-the-factory ammo! Thus, it would appear that big game hunters of the non-handloading variety might well investigate Weatherby products for the best accuracy short of working up their own loads.

Another observation concerns a little-publicized .27 caliber slug; namely, Nosler's 160-grain semi-spitzer. This sturdily constructed bullet could seemingly provide as much practical power and penetration as anything served up by the 7mm - except for one flaw: the 1-in-12 twist of Weatherby's hammer-forged barrels simply won't stabilize this lengthy projectile. I fired nine of them through the 24-inch tube, and only six hit the target, keyholing as they impacted. The remaining three slugs spun off into space and fell to earth I know not where.

But if some citizen had a yen to build a custom .270 WM, and if he specified a 1-in-10 twist instead of a foot-long spin, the 160 grainer would be stabilized and would turn this sharp-shooting sheep rifle into a bruin buster as well.

While on the subject of bullets, I might add that Sierra's 110-grain spitzer may well be the best varmint projectile for .27 caliber magnums. It starts somewhat slower than 90 and 100-grain pills, of course, but its superior ballistic coefficient also sheds velocity slower, meaning it has better long range potential than do lighter bullets. Moreover, I found it very easy to work up accurate loads for the 110 grainer in both my .270's.

Switching to the topic of powder choices for the .270 WM, it strikes me that my work with this cartridge produced an enlightening little incident which might interest many chaps: my initial firings with the .270 WM were done with gradually increased loads of 4350, and I was pleasantly satisfied with the results. In fact, as the load table will show, 4350 gave some of the swiftest velocities and many of the best groups.

I was quite surprised, then, when I read in the 3rd edition of the

Handloader's Digest (page 90) that a certain rifle experimenter of national reputation considered 4350 "... not correct for the Weatherby Magnums." Instead, the ballistic scribe went on to hint that IMR 7828, which is not available to the handloading public at this writing, was far better for Weatherby canisters because "... it has been tested *very successfully* by Weatherby, Inc., and this writer, in Weatherby cartridges." (Italics mine.)

My first reaction was to hide this news from the prying, telescopic lenses of my .270 WM's before they learned they weren't supposed to shoot that well with 4350. Then I sat down and calmly penned a letter to Weatherby, Inc., asking if they would divulge some generalizations regarding their experiments with powders. In particular, I asked if IMR 7828 was as gosh-awful hot as this particular scribe would have me believe.

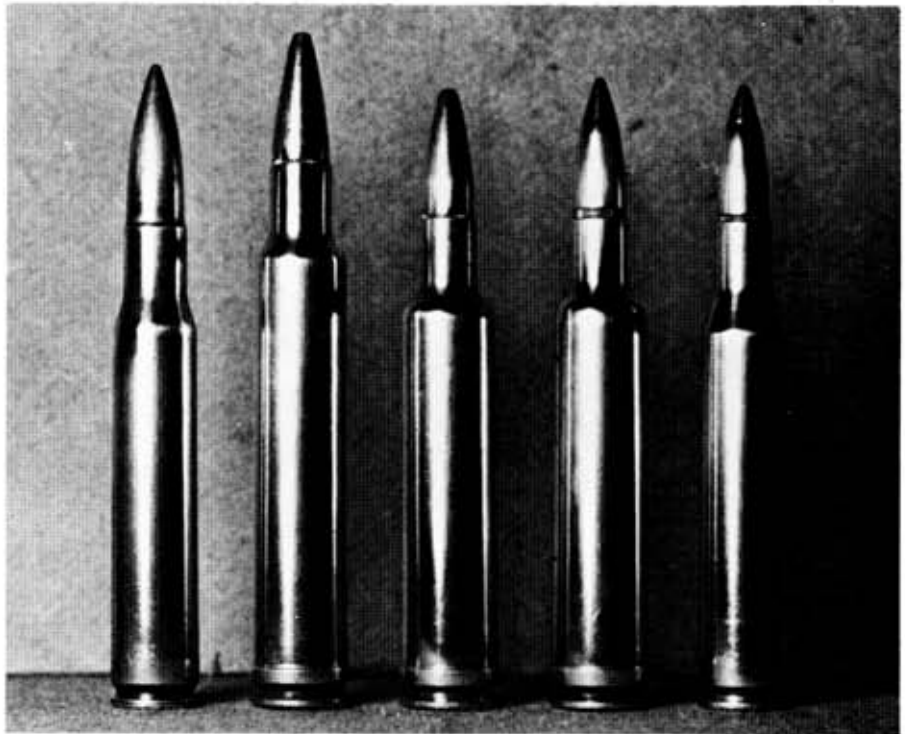
My query was answered by Mr. Fred Jennie, who serves as Engineering Director for Weatherby products. Mr. Jennie informed me that "we (Weatherby) use in loading our ammunition, only 4350, Norma 205, and occasionally 4831. IMR 7816 and 7828 *has not given us satisfactory results.*" (Italics mine.)

In other words, this particular gun writer, using a computer-type powder selector, was actually recommending a powder that Weatherby, Inc. found sadly lacking and was not using — and who should know more about Weatherby cartridges than the chaps at South Gate?

Thus, from my own load development work and the word from Weatherby's engineering director, I would suggest that all handloaders start with 4350 when cooking up homebrew for the .270 WM. My next choice would be 4831, especially if the tube were 26 inches long.

Norma powders are not stocked by dealers in my bailiwick, and I was able to use a back-ordered batch of N205 only briefly before hunting season and winter winds ended my testing. Thus, N205 is not carried on the loading table, which I deeply regret. However, 68 grains of Norma's slowest clocked 3,175 fps with the 150-grain Hornady, while 74 grains of N205 pushed the 130-grain

(Continued on Page 49)



This photo shows, from left, the .30-06, .300 Weatherby Magnum, .270 Weatherby Magnum with 150-grain Hornady, .270 Weatherby Magnum with 130-grain Remington Bronze Point and a standard .270 Winchester with the Remington 130-grain Bronze Point.

Powder charge/type	Velocity	Remarks
71.0/4831	---	3,250
74.0/4831	3,333	3,350
		5/8" groups with 26" barrel; 2" groups with 24" tube.
83.0/H570	3,200	---
65.0/RL-21	3,327	3,361
		2" groups
		Bullet: 150-grain Hornady Spire Point
83.0/H570	3,076	---
		2" group.
83.0/H870	3,160	3,115
72.0/4831	3,110	3,165
		2" group in 26" barrel; 3" in 24" barrel.
73.0/4831	3,189	3,231
		2" accuracy.
68.0/4350	3,194	3,215
		1"-1½" groups with 24" barrel. Best long-range load for big game.
68.0/780BR	3,081	2,967
		2½"-3" groups with most loadings of 780BR.
69.0/780BR	3,105	---
63.0/RL-21	3,115	---
		Bullet: 160-grain Nosler
65.0/4350	3,072	3,095
		All 160-grain Noslers keyed when fired through 1-in-12 twist barrel of Weatherby rifles. A 1-in-10 twist is needed to stabilize this bullet.
50.0/4064	2,545	2,638
80.0/H570	2,829	---
83.0/H570	3,072	3,164
81.0/H870	2,970	3,072
83.0/H870	---	3,129
65.0/780BR	2,624	---
69.0/780BR	2,980	---
70.5/4831	3,030	---
72.0/4831	3,085	3,164
		Bullet: 170-grain Speer
66.0/4831	2,700	---
		3-4" groups.
80.0/H870	2,800	---
72.0/H570	2,425	---
73.5/H570	2,525	2,575
		Obvious yaw on second chronograph screen.
63.0/4350	2,928	---
		4" groups minimum.
69.0/780BR	---	2,965
		Poor shooter; extremely wide groups.
50.0/4064	2,500	---
		Best load found for this bullet. Consistent 2" groups from 24" barrel. Good for 100-yard shots and brush hunting.
		Bullet yaw on second chronograph screen.
50.0/RL-21	2,300	---
60.5/RL-21	2,870	---