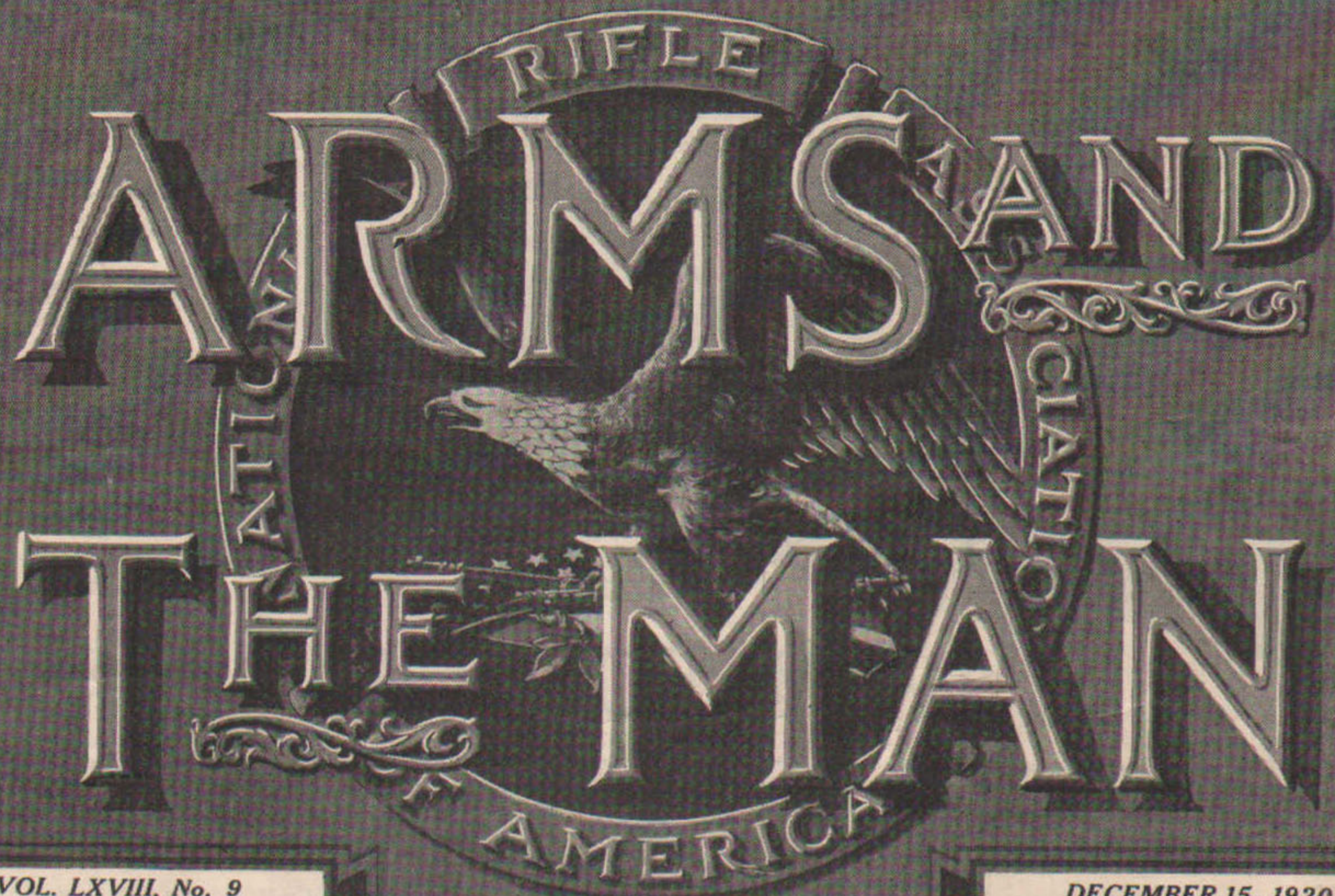


THE AMERICAN RIFLEMAN'S MAGAZINE

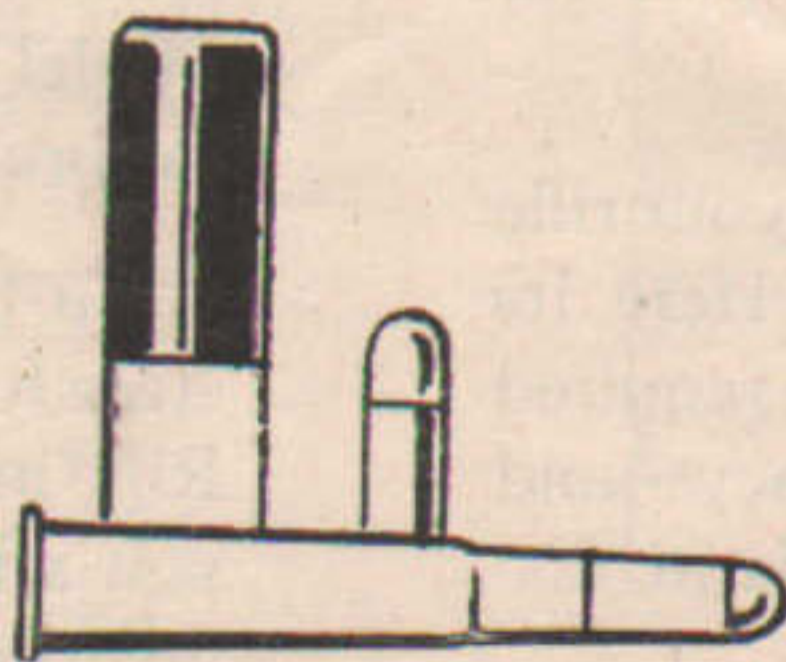


VOL. LXVIII, No. 9

DECEMBER 15, 1920



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ARMS AND THE MAN

The Official Organ of the National Rifle Association of America

Volume LXVIII, No. 9

WASHINGTON, D. C., December 15, 1920

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The Ballistics of High Velocity Ammunition

By DONALD MCK. ASHTON

IN a previous article on high velocity ammunition, there was no discussion of the ballistics of the various bullets under consideration. By analyzing the data given in the earlier article, some very interesting results were obtained. The present discussion will include not only these results, but will go somewhat into the history of the bullets as well.

The old 45-70, firing a 500-grain lead bullet, was the forerunner of the present military rifles in this country. This was the first really effective rifle to be adopted by our government, and is known as the Model of 1873. The bullet, weighing 500 grains and having a muzzle velocity of 1200 feet per second, had a ballistic coefficient of .4125 at 1,000 yards. Considering that the coefficient at the muzzle, or that obtained by use of the formula $C = \frac{W}{c d^2}$ (using "c" as equal to between .8 and .85 because of the shape of the nose of the bullet) as being about .400, the theoretical seems to check with the data obtained by firing. The final velocity at 1,000 yards would be about 770.0 foot seconds.

During the later years of the old Springfield, the bullet weight was cut to 405 grains, at a slightly higher velocity with a corresponding decrease in the coefficient, say to about .35. The reason for the decrease of weight is apparent to any one who has fired the old rifle with the heavier ball.

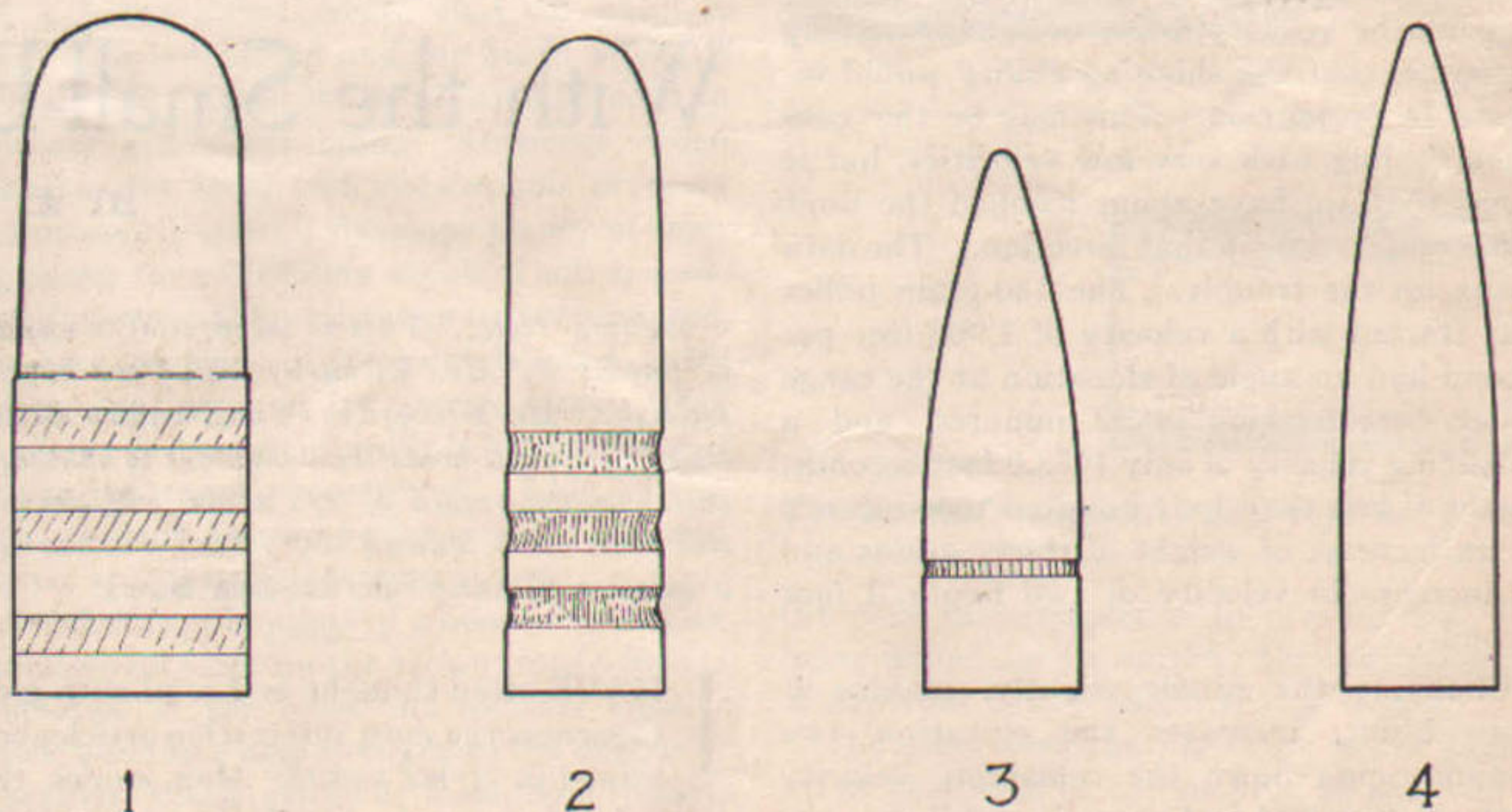
The French bullet, model of 1886, was somewhat on the order of our model of 1898 Krag. The Metford bullet of the British, and the Mannlicher, were along the same lines. These bullets were all brought out around 1880 to 1890. Around the year 1893 we started to experiment with what was to become our next change in shape, and which resulted in the model 1898 Krag bullet of 220 grains, a cupro-nickel jacket (the first in this country), pushed at a velocity of 2,000 feet per second.

For some time previous to the Spanish American War, the Navy experimented with the Lee Straight pull rifle. This was a 6 mm calibre, and the original weight of the bullet was around 125 grains. The velocity was 2,400 feet per second and the chamber pressure was very high, around 60,000 pounds. This bullet was later made to weigh 112 grains with a velocity of 2,550 feet per second. The nose was blunt, of the Krag type. The trouble with the Lee was that of being far ahead of its time, and the high pressures generated by the only powders available at that time were the main causes of its downfall.

This bullet has a ballistic coefficient of .312 at 1,000 yards against that of .331

obtained by using the computed data of Ordnance Pamphlet No. 1,920. These theoretical elevations were supposed to have been corrected for atmospheric conditions, and the apparent discrepancy may be caused by the lack of such correction in the actual data. However, this data was obtained when there was practically no wind blowing, and it is believed that the density ratio was about 1.000. Both the data from the Pamphlet and that obtained by actual firing shows a noticeable lowering of the coefficient over ranges from 1,000 to 2,000 yards, and about the same amount. It would be a very interesting thing to learn if the computers allowed for such a decrease, and also just why they made the allowance. The nose of the bullet compares favorably with one of a two calibre ogive, and it would seem that the coefficient of reduction was about .95, or 1.0. The remaining velocity at one thousand yards was about 830.0 foot seconds. The accuracy, given ideal conditions, was nearly if not equal to our present service cartridge.

When the Model 1903 rifle came out, the Krag bullet was used, with a velocity of 2,300 feet per second. This made a very powerful and formidably projectile. This velocity was later cut to 2,200 feet, on account of the extremely high temperatures that were generated by the heavy charge of WA .30 calibre powder, excellent though it was for a velocity of 2,000 feet per second, the velocity for which it was primarily made. Had we known as much then as we do now about progressive powders, we might be shooting the heavy Krag bullet in our present Springfields.



Types of ammunition. No. 1—Cal. 45, 500-grain bullet, model 1873; No. 2—Cal. 30, 220-grain bullet, model 1898; No. 3—Cal. 30, 150-grain bullet, model of 1906; No. 4—Cal. 30, 180-grain bullet.

Up to the time of the French experiments on a bullet with a sharp point, there had been several suggestions as to its practicability, but they were before their time, although the Germans in 1881 tested artillery projectiles and the results have been worked into our present ballistic tables. The French bullet, model of 1898, has a long point of about seven or eight calibre ogive, and it was found that this bullet gave a very flat trajectory over a range of a thousand yards. Of 198 grains in weight, at 2,380 feet per second, this model has not been changed to the present time. Had our own government, before adopting the light 150-grain bullet, tried out the possibilities of a sharp pointed Krag of the same weight as was being used, some of our present difficulties might have been lessened to a great extent, particularly as regards machine gun fire.

The Germans were working on the Spitz type of nose in the early 1900's. In 1901 the British munitions companies started working along the same lines, and in 1904 to 1906 several types were experimented with. Various other countries abroad had the same idea, with varying weights. The present 1906 service cartridge is an outgrowth of the German idea of the light bullet at high velocity while the Mark VII of the British is the heavy type of the same idea. It was not until 1907 at the Bisley meeting, that the old Metford, or Krag type of nose was laid away to rest by the marksmen of the British.

The Model 1906, 150-grain bullet with a muzzle velocity of 2,700 feet per second, has a ballistic coefficient of about .380 at 1,000 yards. This decreases as the range increases from that point. From the data of the article this coefficient is .401. This is due to the fact that the pressure barrel through which this ammunition was fired gave consistently lower angles of elevation for all the firings than was obtained from service rifles fired about the same time. A tight chamber and bore may explain part of this fact. The remaining velocity at a thousand yards is about 1087.0 foot-seconds with the heavy barrel.

It has been a popular fallacy that by increasing the velocity, bullet weight remaining the same, that the shooting ability would increase in proportion. This may be the case when dealing with very low velocities, but it seems that we have about reached the limit of our endeavours in that direction. The data shows up the trouble. The 180-grain bullet that started with a velocity of 2,900 feet per second had an angle of elevation at the range under consideration of 32 minutes, and a remaining velocity of only 1473.0 foot-seconds, a gain of less than four hundred foot-seconds by an increase of weight of thirty grains and an increase in velocity of two hundred foot-seconds.

Changing the profile slightly, making it more blunt, increases the elevation two minutes, cuts down the remaining velocity over one hundred foot-seconds and lowers the ballistic coefficient. 05, which is borne out quite accurately by the data. The sharper profiled bullet had an angle of elevation of 32 minutes, a coefficient of .554 and a remaining

TABLE I

Ammunition	Angle of Departure	Computed "C"	Remaining Velocity	$\frac{w}{d}$	c	Theoretical "C"
	<i>Minutes</i>					
45-70, 500-gr. bullet.....	170	.4125	768.8	.3405	.83	.4100
Krag, 220-gr. bullet.....	100	.3120	830.3	.3313	1.0	.3313
1906, 150-gr. bullet.....	47	.4011	1087.4	.2259	.57	.3960
180-gr. bullet, 2,900 f.s.	32	.5539	1473.4	.2711	.49	.5516
175-gr. bullet, 2,900 f.s., bt.-tl.	28	.7329	1754.5	.2635	.37	.7120
180-gr. bullet, 2,900 f.s.	34	.5010	1367.0	.2711	.54	.5020
150-gr. bullet, 2,950 f.s. ('06)	37	.4230	1218.0	.2259	.57	.3960

velocity of 1473.0 foot-seconds at 1,000 yards. The other 180-grain bullet, at the same range, had a coefficient of .501, an elevation of 34 minutes, and a remaining velocity of 1367.0 foot-seconds.

The 150-grain service bullet at 2,950 feet velocity gives a coefficient of .420. The cause is probably in the changed weather conditions, and as there was no standard ammunition fired at the time, it is impossible to check the amount of variation. Even with the increased "C", there is only a remaining velocity of 1218.0 feet as a result of the great speed. This covers the flat base bullets, and tends to prove that the answer to the problem of improved bullet shape does not include extreme speed as a basis.

The 175-grain boat-tailed bullet at a velocity of 2,900 feet per second, gave a "C" of .733, an angle of elevation of 28 minutes, and at the range considered, a remaining velocity of 1754.5 feet. This may be in as much error as the service high velocity, but no more. So that there is a bullet that will give all the requisite results that are being demanded of bullets today, and isn't doing a great deal of work, at that, to accomplish the required ends.

There are three distinct phases to the history and development of the small arms projectile since the close of the Civil War. The rifled bore brought with it the heavy low

velocity lead bullet. The development took place during a time of comparative peace, and was not an outgrowth of the necessities of war. The pointed bullet ushered in the second phase. That, too, was a peace time product. This is best shown by the fact that there was so much variation in the weights and velocities adopted. The countries that were far-seeing adopted the heavy bullet, and during the Great War had little trouble when called upon to use that ammunition under conditions that had never been dreamed of before.

The lessons taught in the War were many, and not the least among them is the fact that long range, heavy machine gun ammunition is a necessity. The Germans saw this during the year 1916-1917, and immediately got to work on a bullet weighing over 200 grains. The French already had their 198-grain solid bullet, while the British had their Mark VII of 174-grains.

So we are entering on the third, and best phase of the small arms ammunition development, as considered in this article. A bullet of heavy enough weight to be used effectively by machine guns, with a shape that will be compatible with the long ranges demanded by the Infantry, the accuracy demanded by the marksman, and the ease of manufacture demanded by the Arsenal. This is the bullet of the future.

With the Small-Bore Rifle in England

BY A. G. RICKARBY

Editors Note: This is the first of a number of papers by Mr. Rickarby which we hope to publish. Mr. Rickarby is a well-known British small-bore shot, holds the "shoulder to shoulder" international record of 295 x 300 (30 consecutive shots at 25, 50 and 100 yards) and has been a member of many international teams.

I HAVE often thought as I read with great eagerness the most interesting articles contained in *Arms and the Man* stories that should and do, undoubtedly, appeal to every lover of the rifle, that is seems a thousand pities we, in England, do not possess such a journal, devoted to rifles and their use, with matter having the same amount of punch in it.

The average rifleman does not care a cent about a paper, if most of its space is given over to working out problems, such as adding x to y with the result that the answer is a lemon; and a whole rigmarole to prove how it is arrived at. Useful "kinks" connected with his pet weapon, in fact, anything that may assist the rifleman in his endeavors to excel as a shot, have a very big pull on him, and the more chatty such articles are made, the better he likes them.

Your paper certainly does get the pull over ours, and it does one good to be able to compare the doings of riflemen in your country, with those of our fellows on this side of the pond. As the fight for the "Dewar" trophy

(Continued on page 8)

Game Bullets Again

BY CHARLES NEWTON

"GAME BULLETS" as recently discussed by John Lynn, is not only a very timely article, but very sound as well. The matter of a proper game bullet has not as yet received proper attention from our factories. Therefore I trust I may be permitted to add something of an extension to his discussion, as well as showing methods of meeting the situation.

From the standpoint of the user of the ultra high velocity rifles, the bullet question is far more acute than when used in rifles of 2500 f.s. velocity or less, and the lack of suitable bullets is the basis for practically the only argument against the 3000 f.s. rifle.

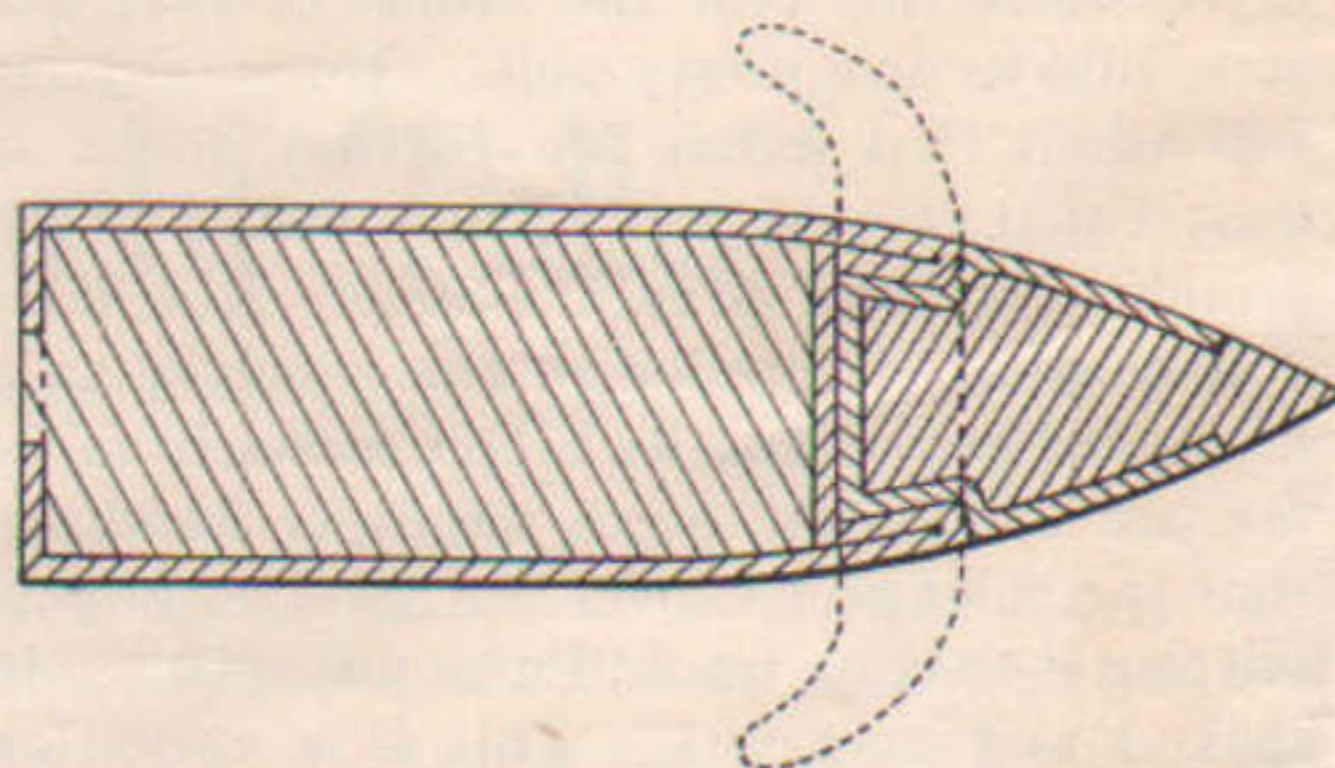
A regular 170-grain bullet fired from a .30-30 rifle at a velocity of 2008 f.s., that being the standard factory load, has a striking energy at the muzzle of 1522 ft. lbs. It requires just that 1522 ft. lbs. of resistance to bring it to rest. Firing the same bullet from a .30 Newton rifle at 3000 f.s. and it has an energy of 3400 ft. lbs., and it requires that amount of resistance to bring it to rest.

This bullet is so constructed that when it encounters the 1522 ft. lbs. resistance, it is deformed to just the right extent to produce an ideal mushroom form. So the 220-grain .30 calibre, soft point bullets used in the Krag and .30 U.S.G. cartridges have the proper strength to mushroom correctly at about 2200 f.s. velocity.

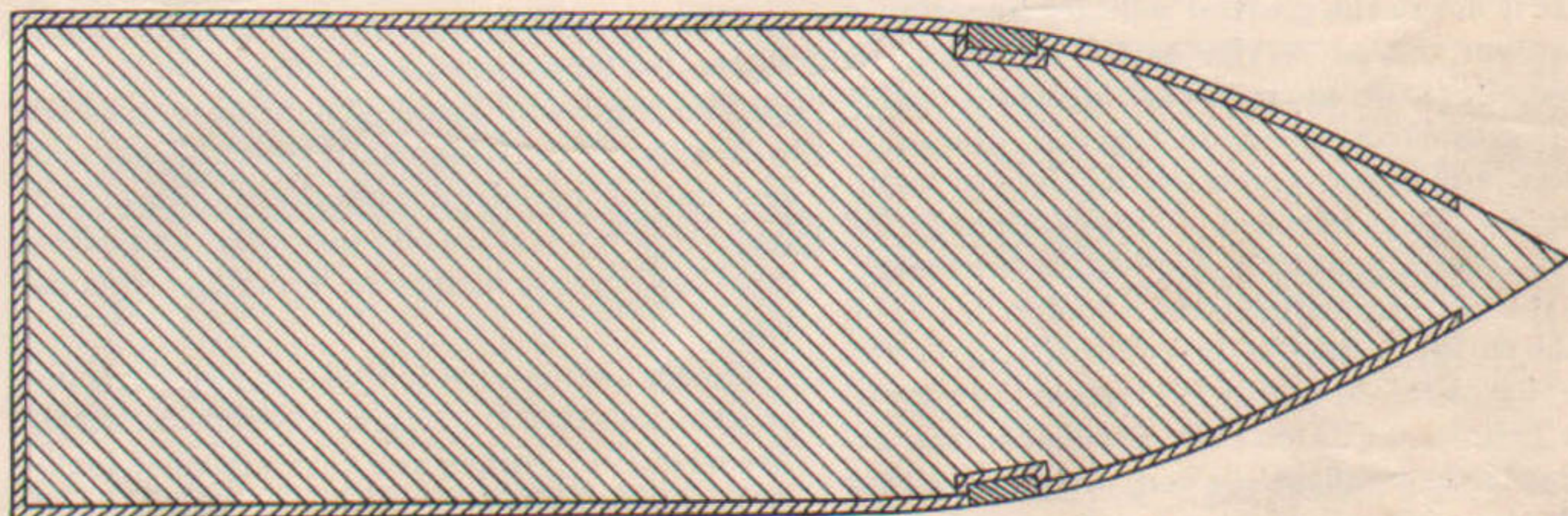
Obviously, when these bullets are driven at 3000 f.s. they develop energy and meet resistance 125 per cent in excess of what they are designed for, and since the mushrooming action spreads open the front end it inevitably draws the core of the bullet up out of the base of the jacket more than when driven at the lower velocity. Take any ideally mushroomed bullet, such, for instance, as are pictured in any rifle catalogue, and cut it lengthwise through and you will find the core well drawn out of the jacket and the rear two thirds of the jacket empty save for air. And this at the 2000 f.s. velocity or thereabouts. When we consider the application of the 125 per cent more of resistance which occurs when the bullet is speeded up to 3000 f.s., we find it inevitable that this mushrooming process goes farther, and the leaden core is drawn completely out of the jacket and first takes the form of a lead saucer driven forward bottom first through the tissues, then this saucer breaks up into fragments, and penetration soon ceases, the smaller particles being quickly brought to rest. As a result any of our soft point bullets will penetrate far more deeply when driven at 2000 f.s. than when driven at 3000 f.s., although they possess far less energy.

Likewise, in any game bullet, since we cannot always choose the exact spot where the bullet is to strike, and might not wish to change cartridges before firing, if we knew just where the hit would be, the ideal game bullet must be one which will expand to a

certain extent regardless of how soft parts are struck, but when it has reached this degree of mushrooming expansion ceases and the bullet in its expanded form continues to drive on, without further expansion, until it has penetrated as far as its energy will permit. In this way only may we realize fully upon the terrific energy of the modern ultra high velocity rifle.



The Newton dovetailed bullet



The soft point shoulder Spitzer

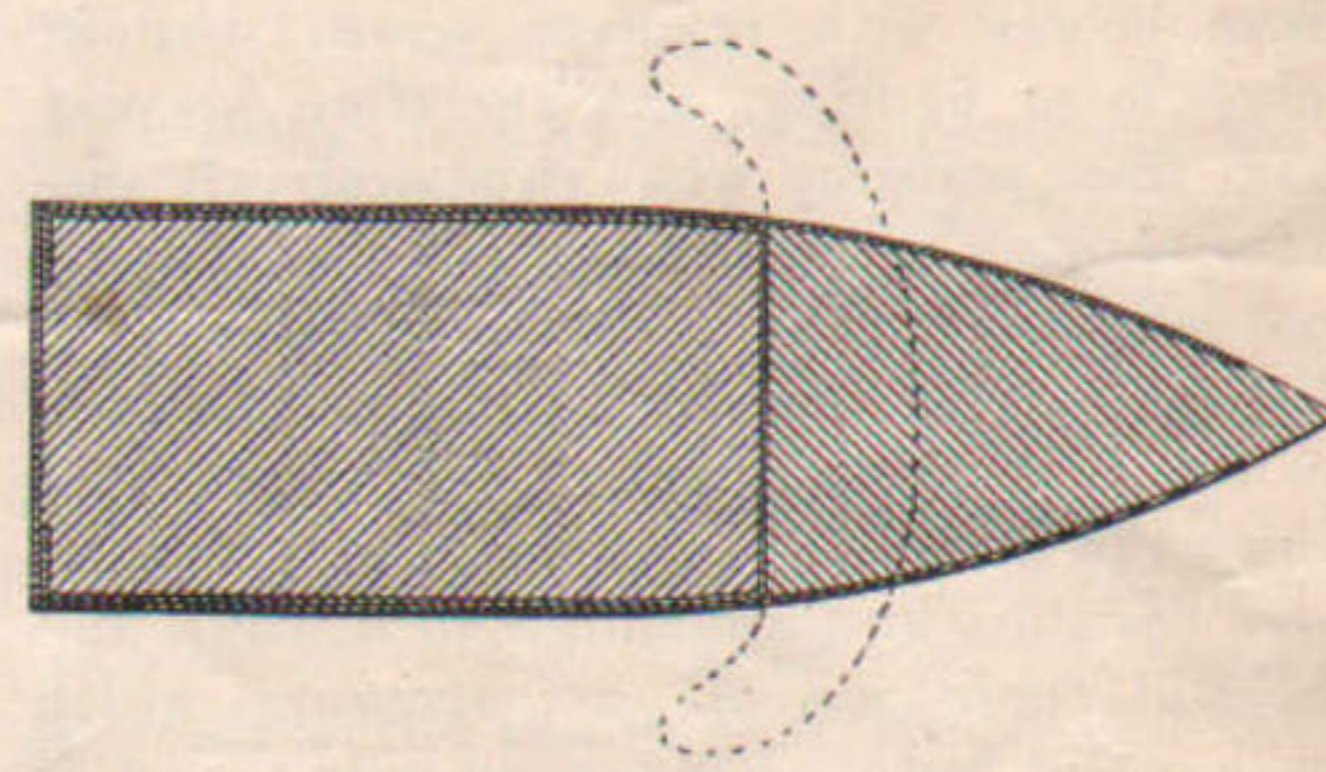
To accomplish this end the writer has patented three different types of bullets, herewith shown. They are based upon different principles to secure the desired results.

One involves a compound bullet consisting of a metal jacketed base, filled from the rear end and similar in all respects to an ordinary full jacketed bullet except that the point is flat. This is inserted and the bullet swedged into shape. Thus it is in appearance an ordinary soft point bullet. However, when it strikes the front end mushrooms properly and promptly until it develops plenty of tearing power for a disabling shock of soft tissues. But if considerable resistance be encountered, the base portion, in its solid fronted metal jacket, continues on its course, intact, until its energy is overcome and it is brought to rest by the resistance encountered. This insures both prompt mushrooming to the desired degree, and deep penetration as well.

Another type consists of a base portion with a solid metal front on the jacket, into which is dovetailed at the front end another smaller bullet, and the whole swedged to the outline of a regular sharp pointed mushroom bullet. When this bullet strikes the front section expands with any degree of ease and promptness desired. But if considerable resistance be encountered the base portion continues its

course, the ears of the jacket which held the dovetailed base of the front section spread out, thus giving a large area of contact, but the base of the bullet does not go to pieces as it is protected by the solid front end of its jacket; therefore it continues its penetration until brought to rest by the resistance encountered.

The third type consists of an ordinary soft point spitzer bullet into which, between shoulder and point has been swedged a steel ring, flush with the surface of the bullet. This permits the front end to expand freely back to the steel ring, but when the deformation has reached this point it stops and the remainder of the bullet continues its course, the ends of the jacket acting as a circular saw, until the resistance brings it to rest. The construction of the steel ring prevents the lead core being drawn out forward into first the saucer shape and then breaking up into small pieces. The demolition of the ordinary soft bullet, when used at high velocities, is due, in great part, to this drawing forward out of the jacket, which leads to its breaking up, after which the different pieces have no more power of penetration than have shot of similar weight. Such being



The Newton compound bullet with flat point

the case, the remedy is to prevent the core being pulled out forward by the mushrooming of the front end. The steel ring does it.

The other contributing cause of the break-up of the bullet is the melting of the lead of the core, opposite the bearing, by the heat developed by the friction of the outer side of the jacket against the bore of the rifle. This

(Concluded on page 9)

The Arm as Well as the Man

BY PASCAL DE ANGELIS

THE writer's distinguished friend, Major Fort, in his able article entitled "Standardizing Pistol Practice" in *Arms and the Man* for November 15, discusses a subject of very vital interest. The question of the pistols which should be eligible for the various N.R.A. pistol matches, and, indeed, for the National Pistol Match, deserves careful consideration in all its phases.

There are several factors which should enter into this consideration:

Are we irrevocably committed, as a nation, to any one model or type of service pistol? Were not a very considerable proportion of the officers and men of the A.E.F. armed with the revolver, and did not a great many of them prefer it, for a number of excellent reasons, to the automatic pistol?

It is not reasonably certain that in our next big war there will be a considerable number of revolvers of service calibre issued to American forces?

Is it not of the greatest military importance that our official service pistol, whatever its type, be kept at its very highest possible degree of effectiveness, in accuracy and reliability, and in convenience and safety of handling, as well as in speed of sustained fire?

Have we not seen the gradual improvement, in the accuracy which the shooter has been able to get out of it in competition, in the service pistol, Model of 1911, from the time of its first issue? Don't we remember the attempt to camouflage the very rotten work that was done with it at first by the match rules which called for seven-shot strings, so as to prevent people from comparing automatic pistol scores with revolver scores without doing some figuring, and therefore prevent them from realizing what comparatively disgraceful work the automatic pistol was doing too definitely? The adoption of the seven-shot string rule was due to misapprehension by the War Department of the accuracy of which the Model 1911 pistol and ammunition were capable, and amounted to a frank and cheerful confession of an inaccuracy which more recent history has proved didn't exist at all. If we had stuck to seven-shot strings, would service pistol accuracy ever have reached its present high point? Would we have had the very slight improvements in the barrel, the greater improvements in the accuracy and uniformity of the ammunition, and the still greater improvement in the average first-rate pistol shot's ability to hold and pull, which this year permitted the Model of 1911 to beat the revolvers in the N.R.A. pistol matches? And if the National Match course had had a fifty-yard stage last year, wouldn't the guns and ammunition and shooters all have been enough better this year to have improved the Model of 1911's average performance at fifty yards very markedly, and prevented the frequently heard expression of opinion on the firing-line at Camp Perry this year that "it wasn't a fifty-yard gun"?

Doesn't history prove that we've not only got to recognize weaknesses—that we've got to have them hammered into our consciousness by repeated comparison—before we are going to get enough general appreciation of them to enforce their correction? And isn't direct competition the only really effective way to get this comparison?

Of course this year the Model of 1911 has come into its own pretty well. Almost anyone will admit that it has proved that it can at least equal the .45 calibre revolver over the present National Match course. But it is still considered inferior to the revolver as a fifty-yard gun. And its better scores in rapid fire are due to the quite improper handicap that the rules give it over the revolver in permitting it to start from "Raise pistol" already cocked and at safety. This is a condition entirely inconsistent with skilful handling of the pistol, and with the pistol's continued reliability. It is an improper concession, by service regulations and the match rules alike, to the butter-fingered individual who knows no gun, and who never should be entrusted with a loaded cartridge until he is able to cock and uncock his pistol with the thumb of the hand that holds it, easily, instantly, and without the slightest danger to himself or anyone else.

Except among experienced and practical officers the question of carrying the service pistol, Model of 1911, cocked and at safety when loaded seems to have had little or no serious and intelligent consideration in service circles. Individual Army Officers who have had much practical experience with the pistol, carry their own personal pistols loaded and uncocked as a matter of course, but so far as can be ascertained, no official notice has been taken of the unwisdom of the regulations covering this except by the 1918 Board on Naval Ordnance.

This question, however, and the highly amusing history of the safety devices on the present service pistol, have only an indirect bearing on the subject of the match conditions. As long as people who can't even handle the pistols they are trying to shoot continue to face the targets, it is not probable that a change in match conditions in this respect could be adopted with safety to markers, other contestants, or even range officers. It is a pity, because it prevents the development of skill of great practical importance in combat, and detracts from the value of the matches—as far as the automatic is concerned—in this respect. Scores being equal, the man who shoots the revolver through the National Match course has proved himself a far abler, more practical, better type of pistol-shot than the man with the automatic.

To return to the matter under immediate discussion, however, does it not occur to Major Fort that in order to keep the service gun, Colt's Automatic Pistol, calibre .45,

Model of 1911, and its ammunition, and the men shooting it, up to the highest practicable standard of performance, competition on even terms with the .45 calibre service revolvers should be encouraged as much as possible?

Of course Major Fort is right in recommending that the .38 calibre revolver be barred. Its lack of stopping power makes it unworthy of consideration as a military arm, and its light recoil gives its user an entirely improper advantage over the .45. It should be a matter of regret that the A. E. F. pistol team was permitted to use .38 calibre revolvers in the international matches. Though the rules may have been interpreted to permit it, the team should have won or lost with the .45 Model of 1911 automatic, or the Colt .45, Model of 1917, or Model of 1919, or the Smith & Wesson Model of 1917 revolvers.

It is submitted that if the purpose of the service pistol matches is to do anything more for American pistol shooting than to give a few men the opportunity to show their own personal superiority under artificial rules—if the matches are to keep the service pistol and service ammunition up to their highest efficiency all the time—the N.R.A. matches should confine each entrant to a single automatic pistol or revolver, the model and serial number to be announced by him at the beginning of the match, and, except in re-entry matches, he be confined to that individual gun throughout the match. Also that in the event of any malfunction, including a misfire, the time-limit shall continue to run on him, and he shall not be permitted to touch the pistol with his other hand in an attempt to correct such malfunction.

Pistols eligible should be any .45 calibre automatic pistol or revolver which had ever been adopted and issued as a service pistol by the United States. This would admit Colt Single-Action Revolver, Model of 1872, Colt Double-Action Revolver, Model of 1909, Colt Double-Action Revolver, Model of 1917, and Smith & Wesson Double Action Revolver, Model of 1917, as well as the Model of 1911. It might admit the old .45 S. & W. Schofield Model too. And there are the same grounds for believing that these revolvers, or at least the Models of 1917, that use Model of 1911 ammunition, should be admitted to the National Individual Pistol Match too.

Revolvers and automatic pistols are designed to fulfill the same military function. And there is surprisingly little difference in the way that they perform it. It would remove most of the incentive for development and improvement in both types to segregate them as Major Fort suggests. The features the automatic needs to make it ideal are those possessed already by the revolver. And competitive use and competitive study are the most certain roads to its perfection.

And the small-bore pistol matches which he suggests would perform an educational function of which I believe he would approve if he would open them up a little more widely. Why not make his Individual Record Pistol Match open to any pistol, of any calibre or type, using its full charge of ammunition? In effect it wouldn't change the match. It would

be a .22 calibre single-shot match, just as he intends. Because no other pistol would have a chance to win against the .22 single-shot. The .44 Russian single-shot wouldn't have a look-in at 50 yards against the .22, nor the .38 or .44 revolvers. And if they did, they would have fairly earned it.

And the other small-bore matches should be open to any pistols too. The time limits would eliminate the single-shots, and the poor old .38 special would have the fight of its life with the .22 automatics, and in a very short

time they would probably wipe it out. It deserves to be wiped out. It never had a real excuse for existence as anything except a hunting or target-shooting toy. Except, of course, as a police or pocket gun, in a model not larger or heavier than the Colt Police Special.

The purpose of the National Pistol Match and of the N.R.A. pistol matches is to improve military pistol shooting—improve the service pistol and the man behind it. As far as skill applicable to the .45 is concerned, as much can be obtained, at far lower cost, with the .22

than with the .38 special. Specialized skill with the .38 special is certainly no greater military asset than the same degree of specialized skill with the .22. The United States Revolver Association matches give the specialized target revolvers quite all the recognition that they deserve. They are as nearly obsolete as the big-bore Schuetzen rifles. The .22 match rifle has wiped them out—and tremendously improved the shooting game. Should not the .22 pistol be permitted—if it can—to eliminate the larger bore target guns?

“Telescope Sight Talks”

BY E. NEWITT

AFTER reading Mr. R. E. Herrick's article reprinted in *Arms and the Man*, one felt sorry he did not go deeper into the subject.

He contents himself, for example, with passing over defects which in fact confine the use of the 'scope sight to target shooting under boudoir conditions, and preclude its use under nearly all the conditions under which shooting is done in hunting and war with a few such appropriate remarks as “of all the cantankerous, obstreperous, fair, false deceivers, there is nothing in the shooting game that can hold a candle to the rifle telescope.” Later he suggests that it is awkward, fragile, wont stay put, demands a different chin position, etc., and yet his article leaves the impression, “with all thy faults I love thee still.”

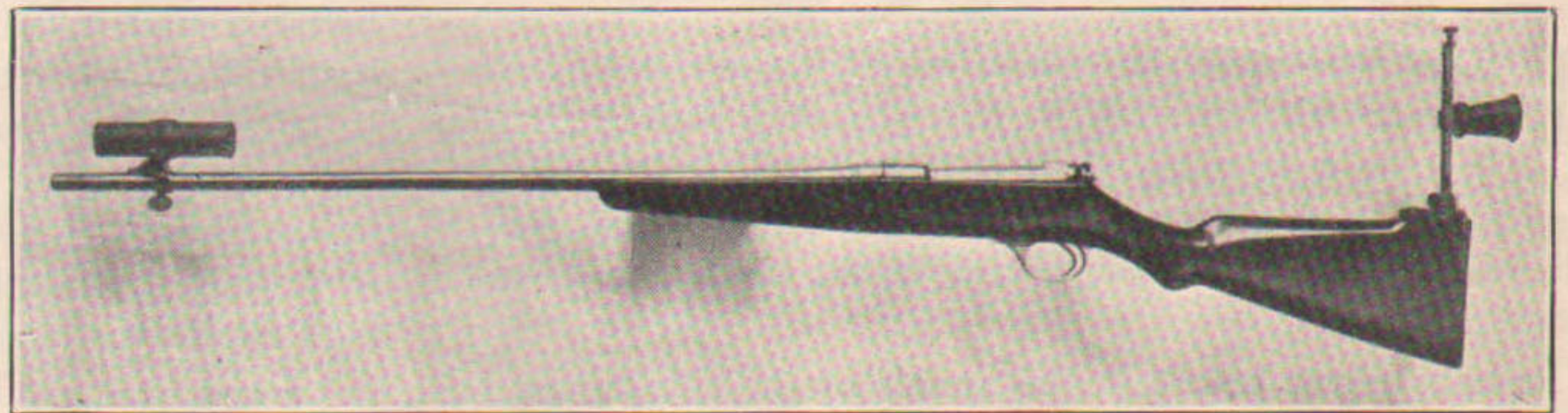
If some writer of repute had the courage to say that the rifle telescope as it exists is an expensive and interesting boudoir toy, but impracticable as a general sighting medium it might bring matters to a head. I have sufficient courage to make this assertion and invite its defenders to throw all the rocks they have a mind to, because in common with many I am on the lookout for something better in sighting media and think that a thorough ventilation of the subject might bring some useful results.

It is sometimes contended that my compatriots are unprogressive because they proceed with the development of their shooting as if no such thing as a 'scope sight existed. The British are nothing if not practical, they have tried the 'scope sight time and again, ever since there has been such an animal, but they are not prepared to assimilate a sight which in all hands and in all countries has proved entirely impracticable save by a few apologists in the U. S. who forgive its generally cantankerous behaviour in return for the few advantages it gives on a few rare occasions.

Nevertheless British riflemen, though obdurate as regards the ordinary sighting 'scope, have not derided the advantages due to a magnified image of the target when shooting.

A small bunch of pretty wealthy gunbugs who have made a hobby of developing military ammunition of great uniformity and small grouping qualities at long ranges, do their

shooting on the famous N.R.A. Range at Bisley from 900 to 1,200 yards, and having no restriction as regards sights, have for the last 10 years used a very simple type of magnifying sight which is entirely free from the elevation, windgauge and stay put troubles of the



British long-range Match rifle equipped with optical magnifying sight system with rearsight on butt plate for back position shooting and rubber eye cup to protect the eye from recoil. The optical front sight in this example is larger and higher than is necessary for smallbore shooting.

American 'scope, and gives perfect results in target shooting in a country where bad light and mist are rather the rule than the exception.

Since the introduction of this sight, credit for which is due, I believe, to that famous shot, Maurice Blood, it has been found necessary to put a 21-inch “high counting ring” in the usual 36-inch bull's-eye of the long range target to diminish ties, still the scores made differ very little from those previously made on the larger bull's-eye.

A fuller description might interest your readers. This sighting combination consists of the same rear aperture with windgauge and elevation adjustments mounted on the rifle so as to come conveniently near the eye, as is used with an iron front sight, but in conjunction with a front sight consisting of a good thick ring or aperture painted on a good size long focus convex achromatic lens, mounted in a metal tube protecting it from sun and rain, just clamped round the barrel near the muzzle, and giving magnification to the target of about 3x. It is the same height as ordinary metal sights, stays put, and gives no trouble. As all adjustments for elevation and wind are made on the same rear sight as heretofore, the introduction of the magnifying element into the combination has involved neither change

eye is simply framed in the act of aiming, as in this method of aiming it is immaterial whether the aperture or bull's-eye appear dead sharp or not. If a point, cross hairs or any other aiming medium, which must be focussed by the eye simultaneously with the bull's-eye are employed, the best results of which this combination are capable are not achieved, though generally better results than are possible with iron sights are always obtainable.

The lens is mounted in a properly constructed cell so that despite the fact that it is near the muzzle where the most commotion takes place, and is used with rifles firing the heaviest charges, fractures and displacement are unknown.

Technically speaking the American 'scope sight is a Newtonian or refracting telescope, the British sight is a Galilean or opera glass telescope, without an eye piece lens, which is not necessary when the rearsight aperture is small. When light is abnormally bad and a small rear sight aperture cuts out too much, a clearing lens may be screwed into the rear sight disc enabling an aperture of any reasonable size to be used, the whole combination then becomes exactly as an opera glass.

In military and small-bore shooting circles
(Concluded on page 9)

ARMS AND THE MAN

1111 WOODWARD BUILDING, WASHINGTON, D. C.

SEMI-MONTHLY—ON THE 1st AND 15th DAY

Editor

BRIG.-GEN. FRED H. PHILLIPS, JR., Secretary N. R. A.

Associate Editor

KENDRICK SCOFIELD

Entered as second-class matter, April 1, 1908, at the post-office at Washington, D. C., under the Act of Congress of March 3, 1879.

That a man shall serve his country in time of war is noble, brave and patriotic; but that a man shall properly prepare himself in time of peace to serve in war is all of these things and more. It is noble with nobility which is real, not ideal. It is brave with a bravery which assumes in time of unemotional peace many burdens, among them that of bearing the lack of appreciation of those who do not consider military preparation or training necessary.

HAND-LOADED AMMUNITION

THOSE who have the best interests of the shooting game at heart, those who desire to see practice with small arms become a national sport in fact as well as in tradition, and to aid its development along the broadest of lines, will do all possible to encourage the intelligent use of hand-loaded ammunition.

Perhaps never before in the annals of the rifle range, has there been as much interest in special loads as there is today. Superficially, it might appear that the tendency among riflemen to reload has its roots in the present prices of ammunition which are undeniably high by comparison with the prices prior to the world war. Grant that to some extent this may

be true, and then consider the fact that only the enthusiastic, intelligent, conscientious small-arms devotee is to be found among the ranks of the reloading clan, and the question assumes a different complexion. The truth of the matter then seems to be that the rifleman's search for special or hand-loads is prompted by his desire to find, if possible, the combination of rifle and ammunition best suited to his own type of shooting. The enthusiasm which prompts a man to experiment with new combinations—if the experimenting is done intelligently—should be fostered wherever found, and there are as good reasons for a marksman developing special loads for special uses, as there are for his equipping his rifle with special sights which meet the peculiarities of his individual vision and a special stock which coincides with his individual length of arm and facial contour. Reloading may not at any time be regarded as nothing more than an indication that a rifleman desires only to beat the high cost of the shooting game.

As to the danger involved in reloading, the handling of high pressure powders, undeniably carries with it at least a minimum of risk, always present whether the reloader knows his game, as well as when he is merely learning the tricks of the trade. Yet reports of serious accidents or fatalities are extremely rare. This would seem to point to the fact that before a man is willing to go the trouble and pains attendant upon reloading, or the making of special loads, he has learned to know and to love his rifle to a degree which has fully acquainted him with its potentialities as a death-dealer, and imbued him with a wholesome respect for the penalties which invariably attend the careless and unintelligent handling of high explosives in quantities no matter how small.

Viewed from the broader angles, reloading and the making up of special loads is one of the surest avenues through which to develop marksmen of the highest type, to whom the rifle is not a mere "grooved tube", mysterious in its workings, but an instrument of precision, capable of being controlled by the intelligent handling of the marksman.

WITH THE SMALL-BORE RIFLE IN ENGLAND

(Continued from page 4)

between the United States of America and Great Britain has created such interest in both countries, I take special note of the records returned, by you fellows, and if in so doing I can put our chaps wise to any particular "kink", I do not hesitate to do so. (I hope, Mr. Editor, I am not creating a job for a censor.)

It has occurred to me that your riflemen may be as eager to read items of news from this side, and in putting same upon paper, I would straightway say that I am *not* a writer, hence it is hoped your contributors will not "haul me over the coals" for forcing my way into their columns, with stuff I elect to put forward in my own way.

Events in these days move rapidly, consequently the progress in marksmanship causes considerable alterations in rules and regulations, shooting conditions, etc; therefore I hope to deal in turn with various subjects relative to

club shooting, competitions, prize meetings and other matters, bearing in mind the view that it may help towards the progress of the sport of small-bore rifle shooting. If any of your readers desire to call upon me for particulars of anything connected with small-bore work in this country, it will give me great pleasure to do my best to supply the necessary information.

In pre-war days we were making considerable progress with our small-bore movement, both in the numbers of men, clubs and quality of marksmanship, mainly through the combined efforts of the rifle associations, at the head of which may be placed the late Field Marshal Earl Roberts, but the conditions under which we have been working since the out-break of the Great War, have retarded our progress. During the first few years of the war everybody tumbled over one another to join rifle clubs, fastening on to any old "gas-pipe" of a weapon, and thanks to the efforts of club officers many thousands did at least know something of a rifle before they were eventually called to the Colors. The coming

into being of the Volunteer Training Corps, or "Grandfathers Rejuvenated" a nickname given to them on account of the G. R. on armlet and the age of some of the men also helped to swell the large number of Rifle Clubs throughout the country.

My own rifle club, for instance, enrolled 200 new members in the first few weeks of the war, dwindling away as their turn to go arrived until the beginning of the present year we found ourselves with a total paid up membership of 19! Yet we still have today, one of the strongest shooting teams in the country and with some of our old members slowly returning to the fold, after having been able to arrange for the due supply of the necessaries of life, before starting shooting again, we hope to go forward with renewed vigor, but, alas, some of our poor fellows will never return.

In the very first act of the drama, we lost our range, a fine indoor range at 25 and 50 yards, accommodating some 25 men at a time, and in these a host of German prisoners were located, possibly they got some practice in upon our butts—one never knows.

A very small percentage of "Grandfathers Rejuvenated" kept going, as shooters, after demobilization of that force, but that is not to be wondered at, for the shooting in those clubs was in most instances carried out with the old fashioned open sights, which would give anyone the "pip" and altogether the men had very little encouragement to become as proficient as the members of civilian clubs. You could be the finest shot in the world, but you were not allowed to shoot on the 25-yard range, until you had fully passed the Musketry Instructor's test, and some fellows, I know, who *could* shoot would "lead him up the street" with a vengeance.

These V. I. C. Clubs are all, more or less, defunct but it is a happy augury to see the revival of a considerable number of rifle clubs that were compelled to close down through lack of members.

Now, just as the boat is righting itself we have hit up another snag through the coming into place on November 1st, last, of the new Firearms Act, 1920. We have been subject to certain restrictions for the last four or five years, but .22 rifles and ammunition therefor could always be easily obtained by the genuine rifleman for target practice. Under the new Act, the Police enter upon the scene, exit the Military, the former being empowered to grant to a responsible officer of a club, a permit or license to cover the clubs' property by way of arms and ammunition, and as far as is known at present, all members owning private rifles may have them embodied in that certificate of registration. This permit, which must cover all goods in hand, as well as possible requirements, remains in force for three years at a time, but one can imagine what troubles will arise in keeping the certificates up-to-date; with new members joining, others dropping out and the changing of the responsible officer to whom the "scrap of paper" is granted. "Wanted, a Secretary," will be the cry in many a club. What the poor devil of a householder, who wants to keep a weapon handy, has to go through, by way of answering questions is enough to turn one's hair grey. He who hath a pistol, doesn't want it nor license, with Police permission, goeth out on his journey to sell. He returns footsore and weary, as no one wishes to partake of the forbidden fruit, so he dashes the thing to pieces and tells the law officers to keep the d— thing, thus saving his half crown registration fee.

I have come to the conclusion that the rifleman's easiest get-out is to register in his own name, notwithstanding above, obtaining a certificate for arms and ammunition rather than chase Mr. Secretary or Mr. Treasurer for supplies, as the before mentioned gentlemen may inconveniently decide to quit this world, with some of your own ammunition on the morning of an important shoot, when there would be no time to get the certificate changed.

What effect this legislation is going to have upon the movement it is too early to say, but we certainly have got to suffer for the sins of the fellows who obtains a hole punching machine for unlawful purposes, and I certainly did not see a "quese" of assassins, burglars

and such gentry waiting at the Police Station to declare their arms, when I went up to do the needful.

If some of us are missing from the British team on the next International match in addition to the chance of being dropped overboard for being off color, there is always the possibility of our being confined to the dungeons for a period of anything up to two years, and in the latter case we would be missing two Internationals, by which time our interest in the sport of rifle shooting would have waned considerably.

However, notwithstanding, our great handicaps from which we have been suffering I think that this year we really have turned the corner as far as quality of shooting goes, whilst the quantity is coming on, and as evidence our scores at open meetings held this year have improved considerably, especially in the latter part of the year, when they reached practically the pre-war standard. During the war, the lack of new rifles was a considerable handicap, and the ammunition was well—rotten (!!?? that's what our range sergeant called it), but new rifles are now available in good numbers and the ammunition from your manufacturers excellent.

Harking back to the "Dewar" Trophy again you fellows have got some glue upon the bottom of the thing and we do not look like shifting it until we can get warmed up, and with this idea in mind we are already off with our International trial shoots, but I really cannot see that scores made during the months of October, November, January and February, are of very much service for picking a team to shoot in July, as although the shoots continue through March, April May and June, a fellow may be shooting quite well in the early stages and tailing off towards the latter months, may still retain his place until the meeting at which the final trials take place and in so doing pushing out a fellow who is making real progress. At the final trials just a lucky shoot by way of a temporary return to form may bring him into the 20 when in "the shoot" he comes back to his bad patch and the damage is done. I am quite ready to admit that accidents may happen in the best regulated families, whichever way you go to work, but luck needs to be eliminated as far as possible and there is a considerable amount of luck for those fellows who happen to have an easy range upon which they qualify, and you all know, what a difference there is in some ranges. I would rather put my money on a team picked upon the aggregate of a long series of shoots at the meeting itself, using all the competition scores as my data, when nothing but form at the time of the match, and upon the spot, would help a man to gain his place.

As it stands at present the 40 high men during the eight months given above are entitled to shoot in the final trials, exact conditions as the match itself, while others may be invited to shoot also, and with one lucky shoot some of the latter may displace men of the 40 "qualifieds". It is hard to please everybody, we know, but I cannot think that the U. S. A. team is selected in quite the same manner.

Our October trials have brought forth 37

men making scores of 381 and over, 394 begin high score, made by one of the best shots who was most successful at the Liverpool Meeting, yet was unlucky to lose his place in the team, through just one unfortunate shoot in the trial. Of the 37 men mentioned above it is interesting to note that the names of only eight appear who were included in this year's team for the trophy.

GAME BULLETS AGAIN

(Concluded from page 5)

is overcome in the ordinary Newton bullets by interposition of an insulating layer of paper between the jacket and the lead core, thus checking the heat and preventing its reaching and melting the core.

All three of the types of bullet above described can be combined with the Newton wire protected point and the heat insulation, and when this is done we will have, I think, game bullets which meet the requirements of not only the ultra high velocity rifles, but those of the 2000 f.s. class as well. By their use the sportsman may utilize the flat trajectory and terrific striking energy of the 3000 f.s. rifles without sacrificing penetration—in fact he will obtain increased penetration, due to the greater striking energy developed. He need no longer choose between the flat trajectory with great superficial striking energy, and the certainty of *sufficient* penetration; these bullets will insure both.

"TELESCOPE SIGHT TALKS"

(Concluded from page 7)

in England, sights containing glass are barred pending the development of some sight that may prove practical under all the conditions in which shooting is possible, hence the field for this type of sight has been small, but with no such restrictions here, there is ample field for its exploitation.

About all we get out of a telescope sight according to the admission of its best friends is magnification and exasperation, and we can get the first without the second out of the magnifying sight described, at less than one-third the cost, while no mounting blocks or screw holes are required, and the shooting position as regards the chin and cuddle of the stock are the same as with the iron sights.

It can be applied to any rifle having an adjustable aperture rearsight mounted quite near the eye, but as the mount must fit the barrel and barrels differ in diameter, further time must elapse before supplies for rifles other than B.S.A. will be ready for delivery.

An attempt was made to develop magnifying sights somewhat upon this principle in America some years ago, and a sight was put on the market under the name, I believe, of Brayton, but did not succeed in consequence of certain essential optical features having been overlooked, and certain imperfections in the matter of the position and method of attachment to the rifle.

The Best from Contemporary Sources

WE had chased a wounded buck "clean out of God's knowledge," over across Benner Creek and out on the rough points at the head of Rock Creek. Brush and timber covered the slopes so high we could not see out. It was new country to us.

Crossings were unknown. There **The .405** we met another hunting party and decided to join forces in an effort to prevent this buck from leading farther away.

Things looked as though he might have stopped on a hill just ahead.

"It's good-by to Mr. Buck if he is not killed before leaving this hill," announced old Flick. No chance to head him off after he starts in this wilderness. You fellows better spread out about 50 yards apart and comb the hill. The wind is in our faces."

"About one shot is all he will give us." one of the newcomers said. "One flash of his tail and he will be gone."

Old Flick agreed gloomily, "Yes, and it is pretty hard to do business with a single shot, when he jumps up, in this thick brush. If I could get four or five bullets after him we would stand a better chance." He partly opened the lever of his 30-30, assured himself there was a shell in the barrel and closed it. "We have just the man to go along with the tracker," exclaimed the other, and turned to call:

"Powell! Come over here." A rather small young man with leathery face and squinting eyes of a forester of years outdoors, plowed his way through the brush to where they were standing, and was introduced.

"This is John Powell—'One Shot Powell,' we've been calling him at our camp, because of his habit of knocking 'em cold the first crack. That shiny old crowbar he is carrying is sure good medicine."

That was how Powell came to be in this story. He walked in beside the tracker. When the buck "jumped, bound for the north pole probably this time, the tracker fired two shots quickly and wildly without effect, and Powell aimed rather deliberately before he cut loose at it. An inch sapling broke off and fell over just where the deer had been.

"I missed and you hit a tree," wailed the tracker. "We'll never see that buck again."

But he was mistaken. Fifty feet beyond the buck had collapsed. Powell's one bullet had sped true after going through the sapling. The buck was bored clean through from left flank to right side of neck, well in front of shoulder. The hole was almost round, about an inch in diameter, with none of the exploded mess such as is made by an ultra-high velocity bullet, yet it was open, and it bled at both ends.

"What are you using, anyhow—a 45-90?" asked Flick, noting that Powell's gun was old, or at least was worn shiney from much carrying and handling.

"A .405 Winchester," Powell replied briefly.

"Well," Flick objected, "the .405 is a regular cannon. You don't use it for all your shooting do you?"

"Yes," was the reply. "I have no other rifle. I use it for squirrels and trapped stuff, as well as deer. And naturally it goes along for bear and moose." Powell smiled dryly.

"Who ever heard of .405 Winchester as an all round rifle?" exclaimed Flick.

Later we got the "dope" from Powell. He had been disgusted with wounding of game by 30-30's, 44-40's and the like, and had some unsatisfactory experience with the .303. He wanted to knock game down with one bullet. Game was getting scarce, he said. There was no longer any to waste. It seemed to him a shame to go into the woods with a light rifle with which he might put bullets into two or three deer before getting one. Besides that, the country where he mostly hunted was getting settled, and hunting parties had become more numerous, so that it was important to kill quickly, without a long chase, or someone else would often get a wounded animal. Heart and other vital shots were increasingly harder to secure, owing to brushy nature of cover.

Reflection showed that a high power rifle was desirable, owing to flatness of trajectory (little fall) and high speed of bullet which made running shots surer. But Powell felt friendly toward big bore. Small bullets that opened well yet held together did their work well, but he looked back on several shots where it was a fair question whether his .30 calibre bullets had acted that way.

Unerringly the conclusion pointed to use of the .405, although at that time Powell, as did most other hunters, thought the .405 was a cannon, with a horrible kick and questionable accuracy in the average man's hands.

When he bought his .405 Winchester Model 1895, he made a mental reservation that he also would buy a model 1892 carbine, 38-40 calibre, such as Ashley Haines likes, for all his shooting except moose, bear and deer.

During the first two months the .405 had not been taken out at all. In six months it had been fired only a dozen times, and that was to get the sights lined up, although Powell was in a country where a rifle could be used on something, game or varmints, almost every day of the year. It still looked like a new gun.

And then one August he got to wearing off some of the finish. A big bitch hound had gone to the woods and raised a couple of litters of pups, the first of them now a couple of years old. This colony of wild dogs was cleaning out the game. The .405 balanced so well, in spite of its weight, and its sights were so clear, that he took it out after them. And when during the next three of four evenings he pulled down on five of the dogs and saw every one of them tumbled with hardly a quiver, he began to fall in love with its ac-

curacy—its practical woods accuracy. The rifle had an excellent trigger pull. Its stock balance made it handle well.

Shortly afterward he got reloading tools, including an Ideal mold, and prepared reduced loads. The day he killed the buck he had along only factory ammunition and very light reloads, the latter for killing rabbits and grouse, but he said that he also used medium power reloads which were as successful on deer and larger game as many ordinary cartridges. Reloads with cast bullets were very accurate, he said, and to prove it he shot a dozen cones in succession off a hemlock tree. A hemlock cone is only half an inch long. *This shooting he did without changing sight from full power ammunition adjustment.*

Powell's idea of a .405 as an all-round rifle had its effect among our own party. Within a few weeks two of us had bought .405 Winchester rifles with the intention of using them practically to the exclusion of other rifles for business shooting. Our men were ripe for the change, as they had been passing through the adverse experience with light rifles which is needed to bring a hunter to the state of mind that understands and appreciates actual facts of killing power. They had an inkling of the truth then, that the .405 is not so over-powered as popular impression has it, that its recoil is over-estimated and over-feared and one of them put a truth into words when he said that none of us really knew the nature of wounds a .405 would make. We were only surmising that its bullet was too destructive for deer.

The fact seems to be that the factory bullet mushrooms rather late after striking, but when it starts to mushroom in an animal it opens out well, that it holds together in game, and that it passes through. It has little of that exploding effect of the .250 and other 3,000 foot velocity bullets. Rabbits may be shot without taking an end off them. Groundhogs (woodchucks) shot with the .405 full power ammunition have that same clean-cut hole about an inch in diameter. Shot with a 38-40 or 32-40, they have the same sort of hole about half the diameter. Shot with a .280 Ross or a .250-3000, a groundhog usually lacks one-third its body when you go to pick it up—the front, the middle or rear third. Deer and bear shot with the .405 are punched through in a straight line, nearly always through and always in a line with the aim. A 38-40 or 44-40 bullet, and often a 38-55, will stop in a deer frequently and almost always in a bear. A light, ultra-high velocity bullet goes to pieces within a few inches of striking, and usually penetrates off from line of aim. We have had them enter square sideways and come out almost straight downward when they come out at all. The .405 wound can be compared to nothing else as well as to the path a piece of three-quarter-inch or inch pipe might make if sledged through the body of your game. This would destroy less meat than many other rifles, but is deadly enough on small game and much more deadly on larger game just because of its depth of penetration. It goes through, and it lets out blood.

Let no one be deceived into thinking that

Continued on page 16



SHOOTING NEWS AND COMMENT

A COURSE of fire upon which qualifications will be awarded for proficiency with the small-bore rifle has been adopted by the National Rifle Association and the details are herewith published for the information of all concerned:

Small-Bore Qualification Course:

Open to life, annual and junior members of the N.R.A. and N.R.A. Rifle Clubs. Unlimited entries.

Marksman and Sharpshooter Course:

50 or 75 feet, 10 shots slow fire, standing.

50 or 75 feet, 10 shots, slow fire, kneeling or sitting.

50 or 75 feet, 10 shots, rapid fire, kneeling or sitting.

50 or 75 feet, 10 shots, slow fire, prone.

50 or 75 feet, 10 shots, rapid fire, prone.

Time limit: Slow fire, 10 minutes for each 10 shots; rapid fire, 2 minutes for each 10 shots, contestants to start with rifle and magazine empty.

Target: 75-ft. N.R.A. for firing on 75 feet range. 50-ft. N.R.A. for firing on 50 feet range.

Rifle: Any .22 calibre rim fire rifle.

Necessary to qualify as Marksman, 425 points.

Necessary to qualify as Sharpshooter, 475 points.

Marking and Scoring: Sets of targets for the above course will be sold to clubs or individual members at 25 cents per set. The competitor must fire at targets of a set.

In case of qualification, all targets of the set signed by an official of the club and by a disinterested member who witnessed the firing will be forwarded to the N.R.A. office. No score sheets are required.

Upon receipt of properly authenticated targets, official marking and scoring will be made in the N.R.A. office and badge mailed to the individual qualifying.

“GLASS EYE” John Hession, holder of the official record at 1,000 yards with the service rifle, transmits through *Arms and the Man* his congratulations to Marine Gunner John J. Andrews, U.S.M.C., and Sergt. W. J. Scheidler of the Arizona National Guard. The veteran long range shot says:

“Editor, *Arms and the Man*”:

“I have read with a great deal of interest the reports in *Arms and the Man* of the remarkable score made in practice at 1,000 yards by my old and valued friend, Marine Gunner J. J. Andrews, U. S. M. C., and later that made by 1st Serg’t, Wm. J. Scheidler of the Arizona National Guard, both of whom I wish to congratulate most heartily on their wonderful shooting and especially so when it is con-

sidered that both of these scores were made with metallic sights and the service rifle.

“It is to be regretted that such sterling performances were not made in ‘open competition’ as is required to establish a recognized record but I feel sure that no one will question the wisdom of these requirements.

“Most of us have at times made scores in practice that we would have given a great deal to have in an ‘open match.’

“In this connection while practicing on the Remington U.M.C. Co’s. 1,000 yard range at Bridgeport, Conn., in June of 1914 I had an unfinished run of 32 consecutive bull’s-eyes when I had to stop shooting in order to catch the last powder train which ran from the shooting park to the factory about three miles away. It was a case of stop shooting or walk and while Captain E. S. Hall and Mr. George Marble who were scoring for me were both willing to make the sacrifice we had to consider the men in the pit.

“The local paper ‘The Bridgeport Sunday Post’ heard of this score and the next day sent a reporter over to get material for a story. It was agreed that the best way to accomplish this was by actual demonstration; so, ‘reporter and all’, we repaired to the park. My first sighter was a bull and so was the second. I then shot a 15 shot possible which gave me a consecutive run of forty-nine (49) bull’s-eyes at 1,000 yards on the standard Army ‘C’ target.

“In this shooting I used a Springfield Rifle, 30-inch Remington-Walker barrel, a 5 power Stevens cross-hair scope and Remington U.M.C. 180-grain Palma ammunition loaded with Hercules Hi-Vel powder.

“While the entire score was witnessed by people whose veracity is above question, I have never made any claim for it as a record because I am familiar with the rules and am willing to abide by them although I have on three separate occasions had long runs of bull’s-eyes at 1,000 yards that exceeded the existing and even the present record.

“I further consider that it would have been decidedly unfair to Colonel Winder (who was at that time holder of the record), and unsportsmanlike of me to even attempt to make record claims for a score that was not shot in ‘open competition’ under record rules.

“I believe we should differentiate between records made with the ‘service’ rifle and those made with ‘any’ rifle and I believe that my good friend Kendrick Scofield has a plan in the works now to accurately compile the existing records at all ranges.

“It might even be advisable and would be decidedly interesting to keep a record of creditable scores that were shot under reasonably reliable but not strictly record conditions.

“If strict adherence to the rules is not observed the same unsatisfactory conditions that now exist in regard to some of the scores made in indoor tete-graphic matches will obtain and I feel sure that none of the well-wishers of the game would want that to happen.

“Since severing my connection with the gun and ammunition business I find how thoroughly dependant I am upon *Arms and the Man* for news of the rifle shooting world and I can always count on an evening of solid enjoyment twice each month when your magazine arrives. I fail to see how any man who loves rifle shooting can get along without it. May your light continue to shine.”

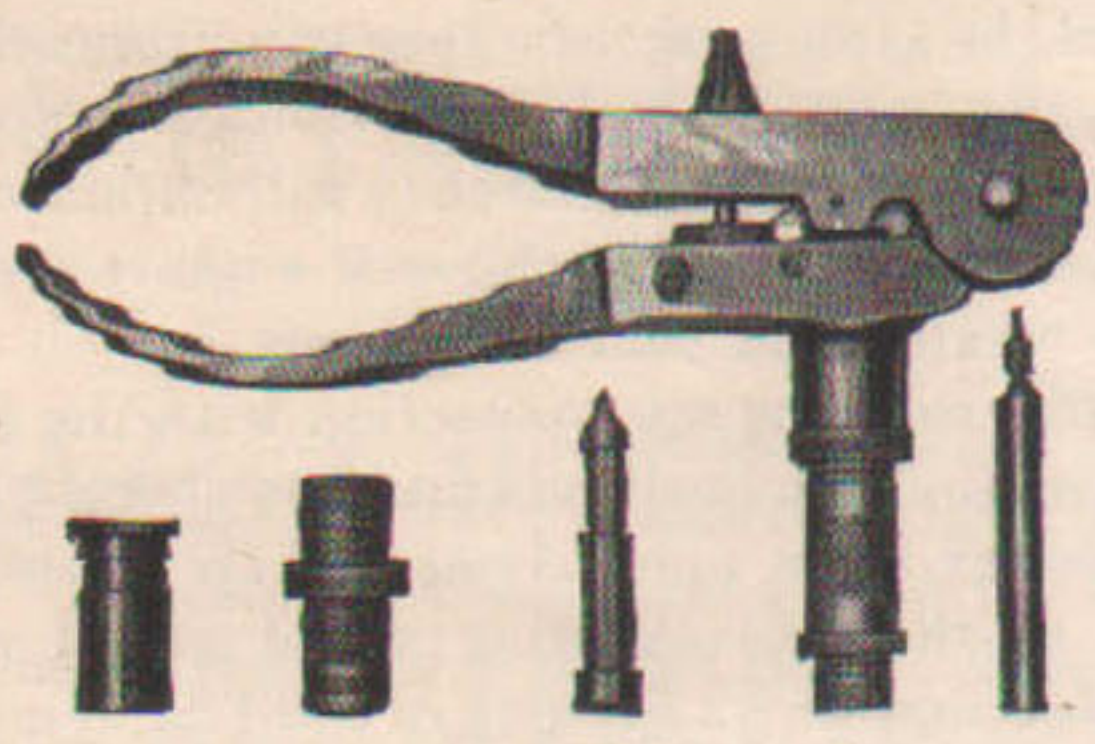
ALTHOUGH the conditions of the N.R.A. Gallery Matches have been changed in response to a wide-spread sentiment that the improvement of guns, ammunition and shooting skill warranted some alteration in the course of fire to make the competitions a measure of greater skill, there are those who believe the old course of fire was satisfactory.

On behalf of the riflemen of Bradford, Pa., D. H. Neilly of that city comes out in defense of the old course and suggests a “shoulder to shoulder” competition between a few of the top-notch clubs. He says:

“In your paper we find the latest and most reliable rifle news. Every paper has something to add to the shooter’s stock of knowledge, regardless of how much experience he may have had, and it is up to us to make new converts to the rifle at every opportunity. Once a rifleman, always a rifleman. The rifle is the key to the greatest brotherhood on earth, and those who neglect to make use of it lack a joy their whole life through. (What say you Brother?) The time is at hand when it will claim many more supporters. The old-timers have made many lasting friends shooting the black powder burners and a history for our side of the pond, keeping the camp fires burning, paving the way for the splendidly equipped rifle of today.

“Our little club up here in the Allegheny Mountains like the way the indoor shoot has been handled by the N.R.A. officers and we believe the target now in use cannot be improved on at this time. It is quite difficult enough to put on the possible 200. The old saying “Show Me” is very noticeable among rifle shots when you talk of “all possibles,” and they claim to do that work. A perfect rifle must be used, perfect ammunition, a perfect range, and the man must be a sort of machine-made article, guaranteed to run six weeks without the slightest variation, not affected with heat or cold, sunshine or shadows—just a High Stepper every minute.

“We fully realize that many of the old faithful clubs have put on wonderful high scores and I don’t wish to tread on their corns, but we would like to suggest that a match be arranged between three or four of the clubs having the best average in next winters indoor shoots, to shoot three or four matches, face to face shooting, five or six men on each team. We believe that most of the clubs would stand a small assessment to help bring it about. The makers and shooters of rifles would travel some distance to witness such a contest.



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SLOW AND RAPID FIRE

in all positions made easy by daily practice with the Hollifield Dotter attachment in the service rifle as issued; skill is quickly acquired. Expert opinions, etc., sent on request.

Hollifield Target Practice Rod Company
Middletown, N. Y.

"(Again Brother Rifleman, would they all put on *possibles* when the band begins to play? Perhaps there would be a noticeable movement for "more sand.")

"I have no axe to grind but want the best men to have all the glory. In other sports the best men face each other. Why not in our game?"

ONE hundred and thirty-three thousand and ninety-eight deer were legally killed in the United States last year, according to statistics compiled by Peter P. Carney.

Impossible as these figures may appear they are correct, and furthermore they represent only the total kill of 17 states, the 17 states in which the hunters are requested to make a report on the bag of deer. The above figures do not take into account the great number of deer that are killed illegally.

In New York, for instance, the commission has reports on a few more than five thousand taken, while it is the common belief among those who hunted in the state that the total kill was nearer 20,000. New York has returned to the one buck law and it is not likely that there will be any more slaughters.

We have been told that deer were scarce but the figures mentioned above do not indicate that such is the case. The figures amaze us, and no doubt will amaze a great many others.

In some states the season is quite long, while in many others the season is brief. In Colorado the season is only four days, in New Jersey five, and in several other states the hunting days for deer are less than ten. You can imagine what the total kill would be if the season was extended in any of these states. One thousand were killed in Colorado in the four days.

Twenty-five years ago a deer was a curiosity in New Hampshire. The past season nearly 5,000 were killed. Deer are so thick in Vermont that the shooting of does is permitted once in every six years. Deer are protected in Illinois until 1925. By that time they will

become so used to men that they will walk up and be shot as did the moose in Maine the past season after a five-year closed season.

Here are the statistics on the deer killed in the states that compiled records:

Wisconsin.....	26,000
Minnesota.....	20,000
Michigan.....	18,000
Wyoming.....	16,166
California.....	13,000
Montana.....	7,500
Maine.....	5,748
New York.....	5,061
Oregon.....	5,000
New Hampshire.....	4,800
Vermont.....	4,100
Pennsylvania.....	2,913
Idaho.....	2,230
Colorado.....	1,000
Massachusetts.....	833
New Jersey.....	522
South Dakota.....	225

THE First Basic Class comprised of last years graduates of West Point of the Infantry Branch, under going instructions at the Infantry School, Camp Benning, Ga., set a new record in the record firing course, which they completed on November 19, 1920.

Out of 72 men firing, 67 qualified as Expert Riflemen and 5 as Sharpshooters.

After two weeks instruction and one week on the range 95 per cent of the National Guard Officers class, consisting of 42 officers, qualified as follows: 22 Expert; 9 Sharpshooters; 7 Marksmen; 4 Unqualified.

National Guard Officers give dinner at the Ralston Hotel.

The National Guard Class of the Infantry School gave a very delightful dinner at the Ralston Hotel on Saturday evening, November 20. They had as their guest Brigadier General W. H. Gordon, Colonel P. B. Malone, Colonel H. S. Wagner, and several other staff officers of the camp.

The Infantry School is a rendezvous for

many oldtime friends and comrades. It was through the suggestion and efforts of Col. T. M. Anderson, a former Commanding Officer of the Seventh Infantry, that a reunion dinner was held by the Officers and former officers of that regiment, at the Hotel Ralston, on Saturday evening, November 13. Covers were laid for thirty officers. Col. Anderson who has served at various periods for a total of 14 years with the Seventh Infantry, acted as toastmaster. Those who ably responded to toasts during the evening were Lt. Col. Samuel W. Noyes, Lt. Col. C. C. Jones, Maj. R. C. Ditto, Maj. T. H. Middleton, Maj. W. G. Weaver, Maj. T. W. Mason, Maj. C. M. McMurray, Capt. John S. Madden and Lt. Geo. S. Beatty.

MORE about possible new revolver cartridges comes from William T. Molloy, of Chicago. Commenting upon Mr. Pugh's recent article, he says:

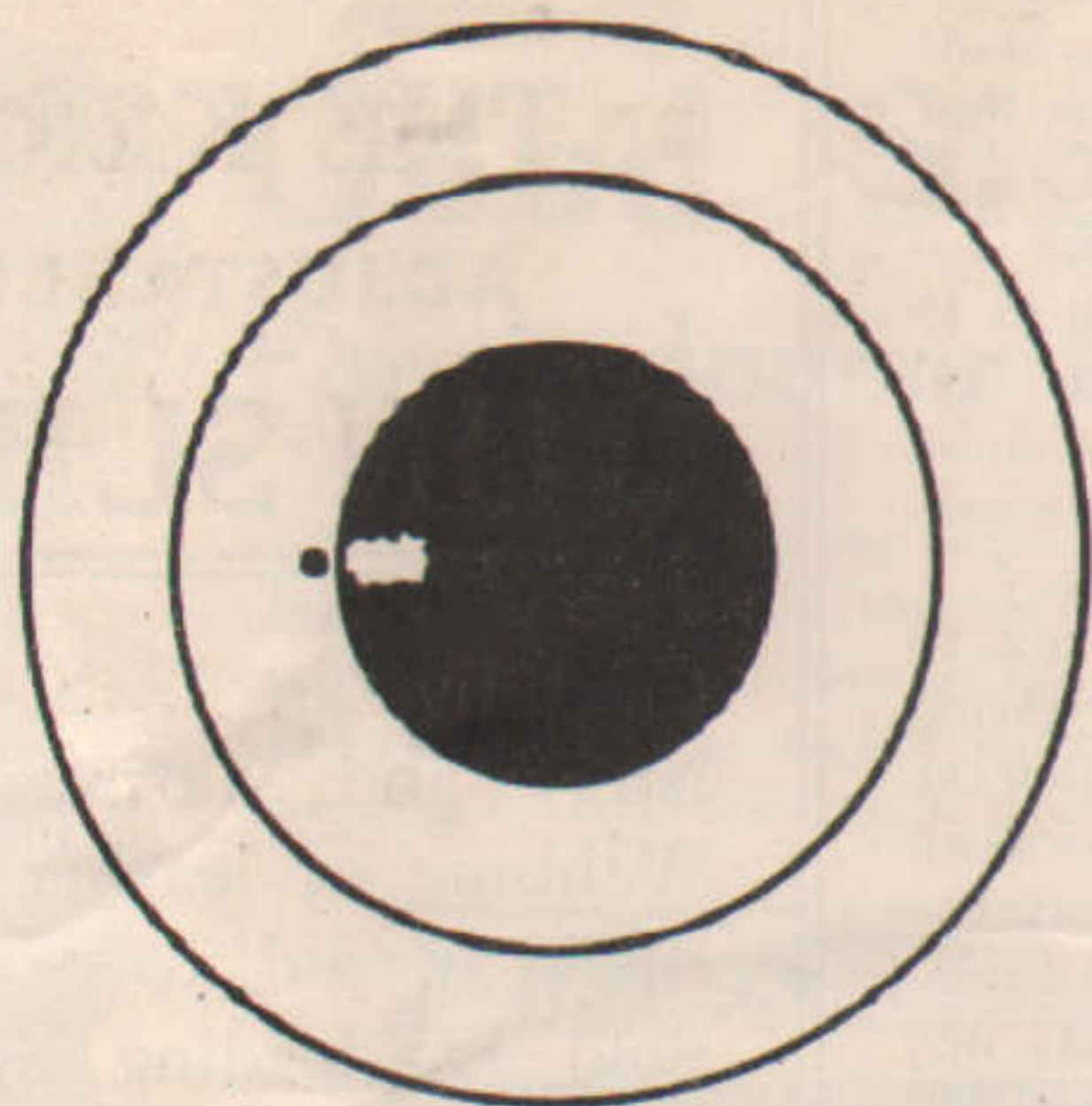
"The Lost .40' by Wm. M. Pugh sure looks good to me and I hope to the major portion of revolver cranks like myself. The



Group made by W. T. Mulloy

reason I am more interested than anyone else at this time, is because I have a combination that I got up myself which I think will equal or surpass anything in existence in the revolver line for accuracy, light recoil, velocity, and killing power at long ranges.

"The revolver cartridge is a semi-rimless, so it can be used in a revolver or automatic without any clips. I chambered a single action Colt and put on a nickle steel barrel 7½-inch taper from frame to muzzle, 1-16th at muzzle so the revolver would balance on second finger. That leaves the trigger finger free to control the trigger and pull without disturbing the aim, which accounts for the wonderful groups I made in presence of others. They also made better groups with it the first time they tried it than they did with their own revolvers. I made 5-shot groups that would be well in on a 25 cent piece, which is



A Remarkable Group at 600 Yards

When Lieut. Michael Fody, of the U. S. Cavalry Team, established a new world's record score of 296 out of 300 points (20 shots each at 200, 600 and 1,000 yards) in winning the President's Match at Camp Perry last Fall, he made one of the most remarkable groups ever made at 600 yards. Nineteen out of the twenty shots were grouped in the bull's-eye in a space approximately 2 1/2 inches high and 4 inches wide.

The reproduction of the score shown here will give you an idea of the wonderful holding ability possessed by Lieut. Fody and of the accuracy of the Hercules Powder that he used.

Lieut. Fody did not change the elevation of his sights while firing this group.

HERCULES POWDER CO.

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484 OUT OF 500

THAT'S the score with which Miss Marjorie Kinder won all *championship honors* in the Third Annual Home Range American Record Match.

Miss Kinder firmly believes in

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22 Long Rifle Cartridges

and her confidence in them—borne from past experience—was a factor which aided very materially in the result.

WESTERN CARTRIDGE COMPANY

Makers of the famous "Field"
Patented Steel-Locked Shell

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Illinois

1/4-inch less in diameter than the 20-yard bull's-eye. I made these groups freehand in and out doors. It makes it much harder to shoot in doors than out doors, but the best groups were made in doors. With 175-grain bullet and 9 grains of No. 3, I made the smallest groups, but that load is too much for the revolver for regular shooting, so I cut it to 8 grains. I think my velocity is about 1,250 feet per second with 9 grains of No. 3.

If Mr. Pugh will let us know through *Arms and The Man* the powder and charge weight of bullet and shape, primer and recoil; groups at 20-50-75-100 yards I will do the same thing then we can see which is the best of the two so we can get the revolver people to chamber and bore their .38 or .45 proposed to handle our cartridges. I developed my combination without one bit of encouragement; and with crepe hangers to bother and throw cold water on my idea by saying the cartridge companies would have had it long ago if it was any good."

A RMS AND THE MAN learns with regret of the death of Mrs. Catherine Agnes (Kelly) Martin, the wife of one of our oldest and most valued contributors. Mrs. Martin died at the home of her daughter, Mrs. James P. Devine, 61 Archdale Road, Roslindale, Mass., on November 28, 1920.

Mr. Thomas Martin, her husband, who survives her, is well known to our readers as the veteran sight maker and as an authority throughout the world wherever rifles have been made, since 1868.

Mrs. Martin was born in Boston in 1849 and was married at Boston in 1872 to Thomas Martin of Edinboro, Scotland, and Boston, Mass. Her life exemplified the ideal of devotion to husband, parents and children, and she was the constant inspiration and help of her husband in all his work, for while her devotion to her family was all her life, and she was without specific interest in arms as such—she never failed to show the greatest concern and hope in whatever problem engaged her husband's study.

U NDOUBTEDLY more poor shooting is caused by the involuntary muscular spasm known as flinching than all other causes put together.

The more careful and accurate sighting and superfine accuracy in the weapon itself avails nothing if the shooter spoils everything by a sudden twitching of the muscles just before or while he is pulling the trigger.

The average man's eyesight is good enough and his nerves and muscles steady enough to do very excellent work with a rifle or pistol provided he learns how to pull the trigger properly and gets over the beginners' habit of flinching.

Flinching is purely a nervous trouble and can only be eliminated by concentration and exertion of will-power on the part of the shooter himself. It is caused primarily by fear of the effect of the recoil of the weapon being fired, and the apprehension of the jarring effect on the nerves of the noise of the report.

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This being so, the method of overcoming flinching is to start training with a weapon having a low recoil and a light report, and since flinching is largely by the result of thinking about what is going to happen when the shot is fired, the shooter should concentrate his entire attention upon endeavoring to hold the gun steadily, sight it properly and pull the trigger evenly with gradually increasing pressure instead of yanking it when the sights happen to line up.

If your mind does not dwell on the recoil and report which will follow your pulling of the trigger, it quite obvious that you will not be anticipating these things and your shooting will benefit as a result.

Snapping practice with an empty gun at a spot upon the wall is an excellent method of learning how to pull the trigger properly and

to overcome the tendency towards flinching. In such practice it is very desirable that the shooter attempt to maintain the aim for a fraction of a second after the hammer has been released. When you are able to pull the trigger so smoothly that the sights do not move or jump out of line, as the hammer drops, you have practically mastered the art of pulling the trigger.

A great many shooters seem to think that practice with a light .22 calibre rifle does not help with the high power hunting or military target rifle. As a matter of fact everything there is to know about proper trigger pulling and sighting can be learned with the small calibre rifle and since flinching and the ability to shoot without flinching are purely a matter of nervous habit, extensive practice with the .22 calibre will get the shooter into the proper methods. When you find that you are developing a case of flinching with a high power rifle, go back to practice with the .22 and keep at it until you have eliminated the trouble.

AS a warning to sportsmen, D. H. Neilly, a Pennsylvania rifleman, send the following account of a hunting fatality:

"Hazelton, Pa., Dec. 1.—Jacob Hait, 56, of Pine Swamp, Carbon County, was killed today, near his home by a bear which he had brought down with a rifle shot. Hait, under the impression that the animal was dead, had started to draw the bear's blood when it struck him down with a forepaw and sank its teeth into his face. The blow broke his neck. The bear died a few minutes later."

Concerning this he says: "If you publish this, it may prevent some of the boys from rushing up to a bear before he puts on his last stunt. Old hunters take no chances, but sit down and light up the briar root, with the gas tube at hand."

THE Director of Civilian Marksmanship, Col. E. C. Stodter, has announced that purchasers of Krag carbines and Krag rifles should not add packing charges to their remittances for these arms. There are no charges made for packing these articles.

The following are available for sale to members of the National Rifle Association through the office of the Director of Civilian Marksmanship:

Winchester rifles, single shot, calibre .22, short.....	\$18.80
Ammunition, calibre .22, short, per M.	3.05
Ammunition, calibre .30, Model 1906, loaded with 180-grain bullets, per M	60.00
Same with 170-grain bullets, per M.....	55.75

There are no 180 grain bullets available for sale.

A WORD from A. P. Lane on the subject of sights. He says:

"The subject of rifle and pistol sights and the proper methods of using them is one which is always good for a spirited argument whenever it is brought up in a discussion among sportsmen or target shooters.

"Some men prefer open sights while others are equally enthusiastic in the support of peep

sights. There is also plenty of argument on the relative merits of bead front sights, blade sights and whether ivory or gold is the best material from which to make them.

"The proper method for using sights also comes in for discussion. The question as to proper sights for any particular individual shooter depends to a very large extent upon his own eyesight, his experience and the general conditions surrounding his shooting.

"The beginner in shooting is very apt to believe that the accuracy with which sighting can be done depends to a large extent upon the size of the sights used, and he often gives as an excuse for poor shooting the fact that the sights on his rifle are too coarse.

"The experience of a great many very fine shots has proven conclusively that reasonably coarse sights can actually be sighted more accurately than can very fine sights, mainly because they are easier to see.

"The man who insists on using a very narrow blade front sight, sharpened off at the top to almost a knife edge and a very tiny notch in his rear sight is either handicapping himself severely or else he is blessed with eyesight far better than normal.

"While the human eye actually perceives objects within a very wide angle, there is a very small area near the center of the sensitive retina of the eye which, while it is actually not quite as sensitive as some other portions, is the point where the nerves seem to convey the best impression to the brain. This sensitive portion covers an appreciable area and the shooter should endeavor to fit sights large enough to utilize a fair number of the sensitive nerve ends, not only because the sight is consequently much easier to see, but because the strain on the eye is much less.

"When very narrow blade front sights are used or very small bead sights, the attention is concentrated upon a very small number of nerve ends and as these nerves tire out the shooter often loses the front sight entirely, although, through an optical illusion, he may imagine that he still sees it as clearly as ever.

"The proper method of seeing the front sights with relation to the rear sight is of great importance. If a peep sight is used the bead of the front sight should be centered in the aperture and if a blade sight is used the top of the blade should occupy the center.

"If an open sight is used all authorities agree that the top of the front sight, whether blade or bead, should be held in the center of the rear notch and level with the top of the notch, regardless of how deep the notch is.

A great many shooters believe that the tip of the front sight should be just visible in the bottom of the notch in the rear sight.

"This is a very poor method of sighting as when the eye becomes the least bit tired the shooter will have great difficulty in maintaining the front sight in the same position at the bottom of the notch for each shot.

"He may possibly get the sight into the proper position when he first swings the rifle to his shoulder, but while he is lining up the sight with the bull's-eye or the object being shot at, he is very liable to lose sight of the bead or blade entirely."

THE KERR ADJUSTABLE GUN SLING

Used by the U. S. Army, Navy and Marine Corps, Webbing or leather for all rifles an aid to accuracy. Sold by leading Sporting Goods and hardware dealers.
Webbing, per doz.....\$18.00
Leather, per doz.....30.00

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IN the small arms division of the Ordnance Department no important changes have been made in the design of the U.S. rifle, cal. .30, model of 1903, during the fiscal year, according to the annual report of the Chief of Ordnance. Considerable progress has been made in the development of a receiver sight for this rifle, four different types having been tested and reported upon in a preliminary way by the Infantry School of Arms, Camp Benning, Ga. Springfield Armory has successfully developed a bolt-action .22 calibre rifle. Considerable progress has been made in the development of a suitable .50 calibre machine gun. A competitive test of four different semi-automatic rifles was held at Springfield Armory by a War Department board during May, 1920. None of these four rifles proved entirely satisfactory, and further development work will be necessary. Considerable progress has been made during the year in the installation at Springfield Armory of manufacturing equipment or the manufacture of approximately 1,000 U. S. rifles, model of 1903, per day of eight hours, and at Frankford Arsenal in the installation of cartridge manufacturing equipment sufficient for approximately 750,000 rounds of calibre .30 ammunition per day of eight hours. No new production of tanks, tractors or trailers has been undertaken except manufacture of spare parts.

Concerning the supply division the report says that as an illustration of the work required of this division it has received and stored in the past year 118,000 machine guns, 1,500 37-millimeter guns, 11,000 guns and howitzers from 2.95 to 240 millimeter calibre, 58,000 automatic rifles, 1,000,000 rifles, 12,000 automatic vehicles and trailers, together with accessories, tools, spare parts and appendages therefor. There have been set aside at designated storage points, under Ordnance Department program, complete sets of ordnance equipment for twenty Infantry divisions, and



No. 2A Combination Rear Sight with Removable Cup Disc, \$6.00



No. 17 Target Front Sight with reversible aperture and globe, \$2.50



No. 5B Combination Target and Hunting Front Sight with Reversible Globe and Ivory Bead, \$2.00.

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make "possibles" possible on any range. They give you a clear, positive bead without the difficult aligning of sights, that common cause of so much inaccuracy. Just get the target in the circle of your rear sight, cover it with your front sight and fire.

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Small-Bore Rifleman's Dope and Score Book

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General Staff, U. S. A.

Chairman Small-Bore Committee, N. R. A.

Contains score sheets suitable for all forms of small-bore shooting, so that riflemen can keep all their scores and records as to sight adjustment and weather under one convenient cover. The book also contains all the practical information necessary for expert shooting with any of the more popular or suitable small-bore rifles, and is based on actual firing by Major Whelen, and *not* on usual information as to ballistics, hence is *practical* and *reliable*.

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under War Department program partial sets for four divisions. Also, complete equipment has been issued to seven divisions and numerous separate organizations of the Regular Army, to National Guard and R.O.T.C. units, and to posts and camps for vocational training.

In the aircraft armament division improvements have been made during the year in the firing mechanisms and boosters as used in different types of bombs. An extensive program of tests was instituted and conducted by the division with the co-operation of the Air Service and technical staff. A limited quantity of thin case and heavy case bombs, demolition and fragmentation, were in process of manufacture during the year. These bombs are made of malleable iron, cast iron, semisteel and cast-steel, to determine the most suitable component metal for use in bomb construction. A 1,000-pound armor piercing bomb is being developed. A new type of incendiary bomb (8 ounces) has been developed for holding a charge of thermit and orders placed for the manufacture of 5,000, to be turned over to the Chemical Warfare Service for loading. Of aircraft machine guns the Browning, calibre .30, model of 1918, has been materially modified, and all such guns (approximately 3,000) have been withdrawn from service and storage and sent to Springfield Armory to be remodeled. The remodeled guns will be known as model of 1918 MI, and all guns of the modified design to be manufactured will be designated as model of 1919. In the syn-

chronized Browning, calibre .30 gun, the design of an improved synchronized type of aircraft gun has been undertaken, the principal features of which are symmetrical arrangement in twin-gun mountings arranged for selective right or left-hand feeding, right or left hand trigger motor, and right or left hand location of operating slide. Development work and modification of the Baldwin type airplane cannon, 37 millimeters, has been carried on during the year. Results so far obtained have been quite promising, and it is expected to eventually develop a gun of this calibre which can be satisfactorily mounted and operated on an airplane.

In the ammunition division, the report states, the greatest advance in the development of ammunition components has probably been made in armor piercing projectiles. Contracts have been placed for 4,350 projectiles of 12-inch, 14-inch and 16-inch calibres, which will penetrate calibre thickness armor at oblique angles of impact of 25° from the normal instead of 10°, as heretofore required. This improvement in major calibre projectiles has necessitated their loading in specially designed plants instead of at the fortifications. Scientific investigation of the relation of the shapes and balance of projectiles, rotating bands, twist of rifling, and clearances between projectiles and guns, on the flight of the projectile, has shown that it is possible to obtain these laws of motion, and experiments have progressed far enough to provide a

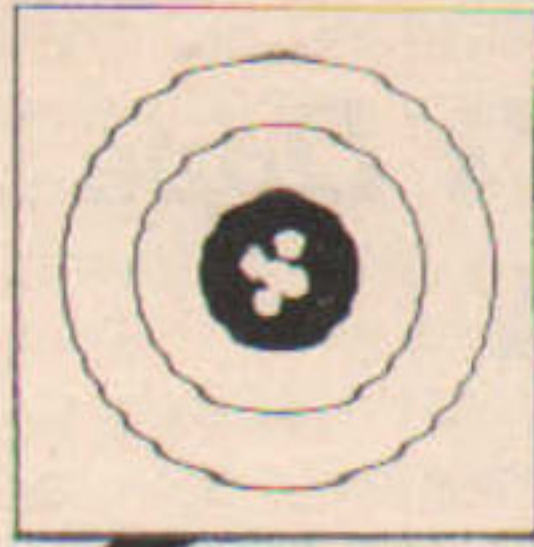
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rational basis for the design of any projectiles having a shape similar to those thus far analyzed. The development of a standard powder and a method of standardization has been completed and is now in operation. The services of the foremost powder experts in the country have been made available for research work on problems by contracts placed with the Massachusetts Institute of Technology, Yale, Cornell and George Washington Universities and various commercial companies. The experience of the war has demonstrated the imperative necessity of having all Artillery fuses bore safe, and considerable success has been obtained in the development work of this feature.



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Dissolves residue of high power smokeless and black powders easily, quickly. Loosens metal fouling. Reduces use of brass brush. Contains no [destructive chemical and no moisture. After using Pyramid Solvent, use 3-in-One Oil to prevent rust and to lubricate. Pyramid Solvent is for sale by most firearms dealers, 3 ounces in a convenient flat can that fits pocket or shooting kit, 30c per can. If your dealer can't supply you, send 30c and we will send you a can postpaid.

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The American Rifle

By Lt.-Col. Townsend Whelen

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Arms and The Man

Woodward Building

Washington, D. C.

THE BEST FROM CONTEMPORARY SOURCES

(Continued from page 10)

all the power the .405 has is never needed on our American moose or black bear. There are certain ham and brisket or shoulder shots which absorb even this tremendous energy, and on which a 30-06 or .303 British are not effective, while a 30-30 and its like are ridiculous. Even small bear and deer often get away from lighter rifles carrying wounds which if made by the .405 would put them down. It is discouraging to plant bullet after bullet into a bear, for instance (as has been done in my observation repeatedly with .30 calibre rifles and with 38-40's), without apparent effect. You buy less .405 ammunition, because with it you wait for the one good opportunity to hit game, knowing you can depend on putting the game down when you do hit. The .405 rifle is a 5-shot repeater, but it is essentially a 1-shot gun for all that because that second hit is seldom needed.

Before telling of various experiences and experiments, let it be said that the .405 Winchester is practically the old 40-72 black powder cartridge in size. Diameter of .405 barrel, however, is .412-inch, hence these two cartridges cannot be interchanged. Owners of certain old .40 calibre Bullard molds will find that their bullets cast .415 and .418 can be sized down for the .405 Winchester satisfactorily.

If ever a scarcity of factory ammunition blights our land, users of the .405 have only to cast some lead bullets and load up with a suitable charge of powder, black or smokeless, and they still have a thoroughly effective hunting rifle. In its day the 40-72 was considered one of the best. The mid-range charge of 65 to 70 grains of FG black powder gives a velocity to the 300-grain Ideal bullet about equal to that of the 40-72. But better mid-range charges are Hercules smokeless powder, No. 305 or Lightning, or DuPont No. 18. About 30 grains of Lightning or 37 grains of No. 18 make comfortable loads.

Short range loads in the .405, it was found by these two men who began to make all-round rifles of their big Winchester, could be loaded to shoot with extreme accuracy. A target is shown here that is one of the best secured, although a number of other loads will do as well. Properly loaded cartridges of this type would group just about as small as reduced loads in any high power rifle.

The starting point for all tests of short range ammunition was the Ideal cast bullet No. 412263, weighing 300 grains. First charge put together was 17 grains of DuPont No. 80 powder. This fired at 50 yards gave a 2-inch group 6 or 7 inches low and 4 inches to the right. Then 20 grains of the same powder were tried. That shot still lower and made a slightly larger group, requiring three or four notches of sight elevations.

After that the charge was dropped to 15 grains, with the result that the group reduced in size to an inch and a half or less, and struck the paper, seven or eight inches higher with same sight adjustment. Further tests, reaching a couple of hundred shots, proved that 15, 14, 13, and down to 12 and 11 grains of No. 80 powder would shoot center at 25 yards with exactly the same elevation as full power factory ammunition required at 50 to 100 yards—and with the almost same windgauge adjustment of sight, the bullets going out to the right not more than half an inch. At 50 yards one notch of elevation was needed. DuPont No. 18 powder in charges of 18 or 20 grains also shot with this same elevation, although the bullets struck two inches to the left. Best full 10-shot group at 50 yards measures just about one inch. This was made with 12½ grains of No. 80 powder. DuPont No. 18 and both Hercules Lightning and No. 305 shot equally well so far as was observed.

One of the men finally settled on the load of 14 grains of No. 80 powder as his standard for short range. It gives a penetration of 8 or 10 inches in pine, and has a rather high trajectory beyond 50 yards. But he likes it because its use requires no change of sight. He can shoot small game, trapped animals and do some practicing with it. Most of such

shooting comes within 25 or 30 yards anyhow.

The other man settled on 24 grains of DuPont No. 18 or the equivalent charge of Hercules No. 305. This is more powerful ammunition, with penetration of 16 inches in pine. It shoots four or five inches low at 50 yards and about three inches left.

Tight crimping of bullets in shells is very important. A load that will make groups measuring less than an inch at 25 yards when well put together will scatter all over a 6-inch circle when bullets are held only friction tight in the shell. These straight shells are a different reloading proposition all the way round than bottle necked .30 calibre shells with which many of us have had experience. In straight shells it is harder to get powder to burn evenly.

It is rather hard to believe that the more powerful of these loads shoot lower than the lighter ones. It is also hard to understand why one powder throws the bullets to the right and another to the left. But the important fact is that these reduced loads are very accurate when properly put together. With them the rifle is everything one needs for shooting squirrels, for instance, rivaling the old-fashioned muzzle loaders of about this calibre in accuracy and easy holding.

The Winchester Company makes an auxiliary chamber for .405 to take .41 short Colt's revolver cartridge. For those who like such reduced power ammunition in a rifle, that combination offers still another advantage, yet it must not be expected to give accuracy such as has been mentioned.

Accuracy with full power ammunition is astonishing after one has entertained the "cannon" idea. At 100 yards bullet after bullet has been observed to strike inside a 2-inch circle, although a 10-shot group usually has one or two holes out of five or six inches from the others. Col. Whelen says that the rifle will make about 7-inch groups at 200 yards. The group pictured here, fired at 150 yards, measures just 7 inches.

All three of these "all-around" .405 Winchester are sighted with Lyman No. 38 Windgauge receiver sights. Two of them have

Ivory bead front sights and the other a V-M. Although these front sights are slightly more easily broken than the piece of scrap iron that sticks up above the muzzle of the rifles as they come from the factory, one can see where he is shooting in very bright light and in dim light, which he cannot with the piece of iron. Easy adjustment of both elevation and windage is essential where two or more kinds of ammunition are used in any rifle.

Fit and balance of this eight pound rifle are so good that one finds them a help in accurate holding. The rifle carries well on the shoulder yet you are not tempted to cast a lump of lead round the muzzle to make it hold steadier. Drop of stock is two and three quarter inches. It ought to be half an inch or three quarters of an inch more. Length of stock is only 13 inches, which is not enough. But that fault is remedied by putting a rubber pad between butt-plate and wood, adding an inch to the length. It is put on with screws that have heads countersunk nearly half an inch by means of metal cups with flanges. When the rubber is compressed, butt-plate, cups and all simply slide down on the screws which are tight in the wood. The only time a 13-inch stock is long enough is when a hunter has on two suits of heavy wool underwear, two wool shirts, a sheep-skin jacket with sleeves, a sweater and a mackinaw coat. A steel butt-plate could replace the hard rubber one supplied by factory, which always gets broken shortly after you start using the rifle.

The rubber pad may ease up the *idea* of recoil. Actual recoil never bothers in the woods. You feel it no more than the kick of a 32-40. For target shooting a .405 jumps more than is pleasant. That is, you must hold the rifle against the shoulder and get your cheek against the stock firmly. If you hold your jaw a little distance away, the rifle after fifteen or twenty shots takes a running start and may land you a pretty fair jolt on a tender spot. But, it may be said again for emphasis, the recoil need not bother anyone, and does not interfere even with target accuracy, let alone game shots in the woods.

A few figures may be excused for the sake of comparison they show. A 45-70-405 bullet requires more than half a second to travel 200 yards. A 405 Winchester bullet goes that distance in less than a third of a second (less time than the 30-30). Experienced hunters will recognize what a help this speed is on running shots.

A 45-70 bullet falls about three feet at 200 yards, and upwards of eight feet at 300 yards. A 30-30 falls about one foot at 200 yards and two and a half feet at 300 yards. The .405 Winchester bullet falls ten inches at 200 yards and about two and a quarter feet at 300 yards.

Striking energy of the .405 at 200 yards is greater than that of the 45-70, the .35 Remington Rimless, the .32 Special, the 30-30 and a large number of similar cartridges at the very muzzle of their rifles. At 300 yards the .405 strikes harder than the 40-65 at its muzzle. At 500 yards it strikes harder than 38-40 rifle at its muzzle. Striking energy, however, is deceptive. One must remember that 40 calibre is bigger than 30 calibre. Penetra-

tion figures for the soft point bullet are given as 13 inches, and the books give the same penetration for the 220 grain .30 calibre soft point bullet, but anyone who has tried the two bullets on game knows that within 200 yards the .405 plows through much more depth of animal tissue than the 30-220 penetrates.

Big bore rifles are famous for their easy cleaning. The .405 is a dream to keep in order compared to a .25 calibre or even to a .30 calibre. That is a feature of importance in a hunting rifle, for a tired man will neglect the job when a lot of swabbing is required, particularly if it had to be repeated every day.

This big cannon, therefore, makes a pretty good all-round rifle. The "medicine gun for lions" makes a pretty fair grouse or squirrel gun. It is a heavy, business-like piece of ordnance but it carries well on the shoulder and holds exceptionally well in aiming. It is a cartridge that in accuracy takes rank above the average among hunting cartridges. The factory bullets travels faster and takes less head-lead than a 45-70 or even a 30-30 at game-killing ranges. It falls less than a 38-55 by far and even less than a 30-30. And as for killing power, there is no comparison even with the most powerful of small bores, for it will knock game out clean with one shot, drop it on the spot or close by and do this not once in a while but eight or nine times in ten. This includes the big bear of the north and the tough little black bear of the east and the Great Lakes country, and moose and elk. Reduced loads, which can be charged to equal our old friend the 40-72 black powder cartridge or charged in a whisper for very short range shooting are very accurate. Some of them will shoot at 25 yards without change of sights from adjustment for factory ammunition. Others will make this rifle powerful and effective with nothing except black powder and lead to use, if the need ever arises.

A man owes it to himself and to his companions in a party to kill game when the chance comes, because hunting is expensive and time is precious and opportunities for shots sometimes are not repeated. He owes it to the game to kill his legal limit and then to stop—and that does not mean to take the legal limit out of the woods while leaving behind two or three times as much that died of wounds. The more powerful rifle is more in keeping with game conditions of the times and is more humane.

When the 32-20 Marlin Model 27, handling the high velocity load, was first marketed, a certain gun dealer told his customers that this was the ultimate big game gun for America. "There is less game to shoot than there used to be," he said, "the country is getting settled up so that a long range weapon is dangerous." And he asked them, "What's the use of carrying a big gun built for shooting in virgin country?"

The truth is exactly the opposite. With a light cartridge a hunter sprays the woods full of bullets as long as the game is in sight, hoping to strike a vital spot or to hit it so many times it will fall. We've all heard these volleys as shot after shot breaks the silence of the woods on a frosty morning of hunting

weather. You can tell when he has emptied his magazine, filled it and started shooting again. Many of us have heard the bullets singing or zipping overhead if his game happens to be scurrying along a skyline. Experience shows that a man with a .405 rifle will not indulge in such antics. He fires only when he gets a fair shot, because with the first hit his game goes down. One .405 bullet is surely less dangerous to other hunters than ten small bullets, and easily may be more effective on the game fired at.

—John Lynn in *Rod and Gun in Canada*.

A CORRESPONDENT betrays considerable anxiety respecting a gun which reveals signs of "pitting" in each barrel just forward of the cartridge chamber. This is a second-season gun of first-class quality, and information is sought as to the probable cause of the trouble and the best means for its eradication and prevention. My correspondent seems

Barrel Erosion. inclined to assign to softness of the metal some of the blame for this trouble, for he remarks that the barrels appear to be very soft, judging from their high susceptibility to injury when he is scrambling about over stone walls, etc. The relative hardness or softness of the barrels is a matter for the metallurgist, but personal experience in the field convinces me that the gun barrel is not yet made that will endure contact with stone walls without showing some sign of injury. Various shooting excursions here and there amidst the stone walls and rocks of Scotland, Cumberland, Yorkshire, and the Italian Alps have conclusively proved to me that in such environment sporting firearms may receive more serious damage or disfigurement in one week than would be caused by a whole lifetime of use in the woods or marshes of East Anglia. Go how you will with gun or rifle among rocks and stone walls, freestone or granite, and it will task human ingenuity to the utmost to keep barrels free from scratches or other injury. Even the sportsman who, when stalking, keeps his rifle swathed in canvas or leather cover, he seldom comes off without a few scratches—much of which injury will probably occur through violent contact of the barrel with a rock or stone at the moment of discharge. Wittingly or unwittingly the barrel is held near to, or actually resting upon, a rock whilst aim is being taken, when the violent rebound from recoil may issue a most damaging blow. Only this year was this effectively demonstrated when shooting a jackdaw whose main purpose in life appeared to be the filling up of one of the chimneys with sticks. Poking the gun quietly past the stone jamb of the front door, I got a pot shot at Mr. Jack through the top of an elm tree, but at the expense of a slight indentation of the right barrel in its thinnest part, caused by the gentlest of taps against the sharp stone edge through the recoil. No, so far as my experience serves it does not seem to matter one little bit whether the barrels are of that composite order and spiral structure known as "damascus", or of solid-drawn steel of various shades and nuances of carbonization, from Swedish iron to the steels of Whitworth,

Vickers, B.S.A., Westley Richards, Greener or others which are used now so extensively, for not one of them can be regarded as having any special immunity from injury when bumped up against stone walls. At all events that is my experience. So much for my correspondent's suggestion; now for the queries he raises.

First, therefore, as to the cause of "pitting." That alveolate condition is induced partly by the erosive contact and high pressure of the powder combustion; also in part through the coating of the barrel interior with acid products arising from the discharge of both propellant and primer charges. Gun barrels are highly elastic structures, and as they stretch under the strain of explosion the otherwise bright and glassy surface of their interior becomes more spongelike in its susceptibility to the insidious inroads of the residua of combustion. Briefly put, these appear to be the cause of gun-barrel "pitting", and having some knowledge of this and of the evil effects of these highly deleterious residua, the sportsman's constant object must be to keep in check that black plague as far as possible.

Next, as to the best means for its eradication. If the "pitting" is not very deep, by all means send the gun to the maker to obtain his opinion as to whether the barrel measurements will permit of "lapping" or boring out sufficiently to effect removal of the eyesore. Assuredly the gunmaker is the man to consult, and it is quite possible that as the gun only left his hands last year, the injury may prove so slight as to permit of this renewal of the glasslike interiors of a fine gun. Indeed, it

would be rather surprising if it were found impossible thus to remedy the evil after merely twelve months' use. If, on the other hand, it were found that erosion had proceeded with such abnormal rapidity that re-boring could not be recommended, then the only course open to my correspondent would be to effectually check further inroads of the destroyer by constant applications of one or other of the special kill-acid preparations now on the market. Among these anti-acids may be mentioned Vickers' Anti-corrodite, which I have been using now for some time in my own shot-guns and rifles with entirely satisfactory results. In these high-pressure days anything that will effect savings in those costly items, time and labor, is sure to receive attention. Anti-Corrodite certainly does both, and experience convinces me that it confers a further benefit of equal if not greater, import—e.g., the prevention of barrel wastage. It is well known that barrel "life" may be greatly shortened by neglect, and it seems certain that in Anti-Corrodite is provided a sure conservator of the ballistic qualities of all firearms.

Whenever the question of barrel "pitting" in the shot gun comes up for discussion, information is certain to be required on two main points—the safety of the arm, and the preservation of its shooting powers. Only last week a 12-bore gun of a very old pattern, 35 years old at the least, and very deeply pitted at the breech end of both barrels, was shown to me with the question: "Is it safe to use?" To that query the only reply to be given was that "I would not care to use it my-

self with modern explosives, seeing that the old gun was unmistakably designed for use with black powder." And there are hundreds of such guns scattered broadcast throughout the country, and now and again one does suddenly give out with dire results to the user. One such case was reported this last week, and if he recovers that man will go about for the rest of his days minus the best part of his left hand. And who can judge as to the safety of these old and badly pitted black powder guns? The gunmaker can gauge up the barrels and ascertain the thickness of the metal walls, but can he ascertain the depths of those yawning "pits" which have been forming for the best part of a generation? I think it would be impossible for him to do so. And certainly I think it inadvisable to send such guns to the Proof House for re-proof with nitro powder, for supposing they came through the ordeal, it seems certain that the stress and strain thus thrown upon action and barrels could only effect a shortening of their period of usefulness. As to the other question of the preservation of a "pitted" gun's shooting powers, it must occur to the least observant that anything which favors an escape of powder gas past the driving wads will certainly insure a loss of power. With small "pits" such loss may prove to be a negligible quantity, but where erosion leads to enlargement of the bore, or to a marked longitudinal scoring of the barrel, then a more certain and ascertainable marked reduction of ballistic effect must be expected.

—HENRY SHARP in *Shooting Times and British Sportsman*.

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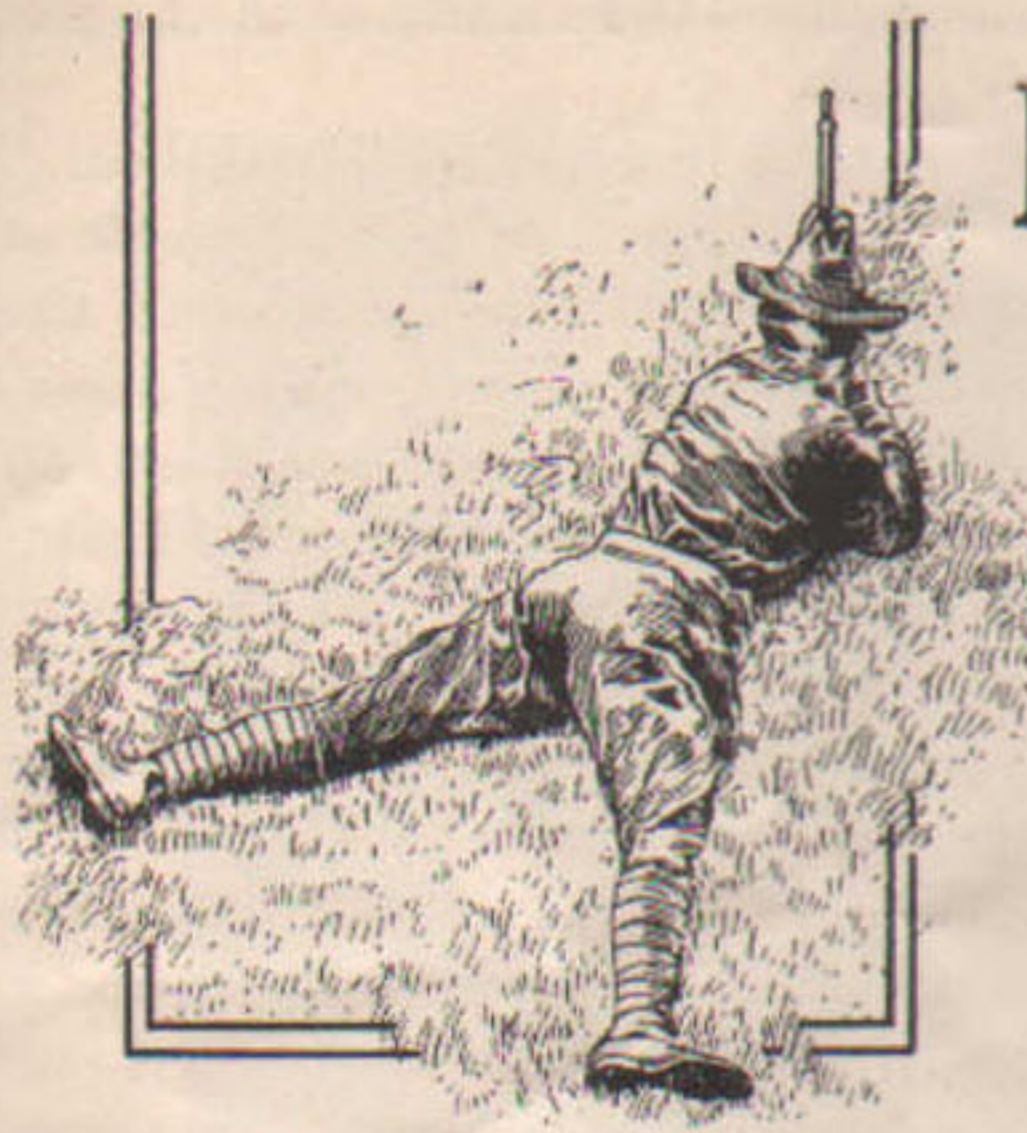
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ARMS AND THE MAN

WASHINGTON, D. C.



Loads And Re-loads

In this column, conducted by Lt. Col. Townsend Whelen, will be answered inquiries pertaining to target and hunting small arms, hunting licenses, game guides, and kindred subjects. An effort will be made to reply to inquiries direct by mail before the appearance in this column of the answer. The service is free to all, whether the inquirer is a subscriber to Arms and the Man or not. All questions are answered at length by mail. Those portions of general interest are published here.

WITH regard to the question of an accurate reduced load for the .45 Colt cartridge, for J. R. P., New York, I see that the Peters Cartridge Co. has in its list a Semi-Smokeless mid-range cartridge with 255 grains bullet, a smokeless mid-range cartridge with 230-grain wad-cutter bullet, a 28-grain semi-smokeless load with 230-grain bullet, a semi-smokeless and also a smokeless gallery load, each with 140-grain (round) bullet.

The Remington U.M.C. Co. has only a 28-grain black powder cartridge with 250-grain bullet. Whether any of these loads are accurate I cannot say, never having tried any of them but should think the Peters smokeless with 230-grain wad-cutter bullet should be as good as any. Of course the defect of the .45 Colt as an accurate target gun is that the chambers are bored large so that all factory ammunition goes in very loosely and easily, an excellent feature in a hunting or military weapon, but hardly conducive to the finest accuracy in a target arm. This, I take it, is the reason why the revolver enthusiasts have paid so little attention to the .45 Colt hitherto, but have preferred the .44 Russian or Special in large bore ammunition.

If J. R. P. wishes to make up a mid-range load for himself he should try to get a mould for either the Ideal solid base bullet No. 45,467 weighing 200 grains or for their hollow base bullet, No. 45,468, of 185 grains, and either of these with about 3 grains of Bull's-eye should give good results especially in shells expanded by firing to be a good fit in the chambers.

Mr. T. T. Pierce of the American Small-bore League, Tenafly, N. J., has a mould for bullet No. 45,467 and would, I know, make any quantity of these bullets it desired.

Another bullet which might be tried is the Ideal No. 457,130, of collar button shape, weighing 144 grains, and with a very deep cannellure for lubricant but I hardly think this would be very accurate beyond 20 yards. It would of course need to be sized down to .454 but this could easily be done.

As regards a new barrel for a .50 Remington pistol, there is Mr. Chas. H. Barnes of 100 S. 4th avenue, Ilion, N. Y., who would do this work for J. R. P. He bored out a 32-20 Single Action Colt for me to take the .38 Special and has made a very fine and accurate gun of it and at the present time is fitting a .44 Special barrel to an Army Model Remington pistol for me.

You might file this information for reference

or copy it and forward it direct to J. R. P. I think it would interest him.

I was a good deal interested in your method of cleaning a rifle after use with high power smokeless powder and metal cased bullets, written in reply to H. D. S. of Bloomfield N. J. and also reproduced in *Outdoor Life* for December.

In Australia however we had an oil which saved us all that trouble. I have described it once before but will do so again. It is called "Burrsthreo" from Mr. Burr, the inventor, and the .303 rifle, in which we use it. And is very largely composed of crude carbolic.

I used to apply it by dipping in it a bristle brush on the end of my cleaning rod, passing it up and down the bore while the barrel was still hot from firing and then putting the gun away till next shooting day, when, one cleaning out the oil before firing, the bore would be bright and shining and with no trace of rust or corrosion. I have even left my Lee-Enfield .303 for as long as five months after one application of Burrsthreo in this way and the result was just the same. And this after using cordite ammunition and 215 grain cupro-nickel cased bullets. That there is very little metal fouling in my barrel is shown by the fact that it takes easily a .3030 plug gauge and absolutely refuses a gauge of .3035.

I also find this oil useful in preserving the bore of my .22 target pistols from corrosion. First I clean them out with 3 in 1, then dry out and then put through a patch soaked in Burrsthreo. No sign of rust has ever appeared after this treatment.

I have only one bottle of the oil at present though expecting another from Australia soon, but I think I could spare you a small sample if you would care to examine it.

If so you have only to let me know and I shall be pleased to forward it to any address that you may name.

H. W. FRY, New York City.

Answer: Thank you very much indeed for your letter of recent date. I have transmitted the information relative to the .45 Colt cartridge to J. R. P. and have no doubt that he will be very glad to get it.

Relative to the cleaning of the bore with your solution Burrsthreo, I cannot help thinking that the only action that this can have on the barrel is to protect the potassium chloride from becoming damp from water; and personally I regard it as rather a makeshift and can hardly see any use of using it when water

is so cheap. We have had both the Bureau of Mines and the Bureau of Standards investigating this subject and they both tell us that there is no oil or oil solution which will dissolve potassium chloride and that it only can be dissolved in aqueous solutions.

Thank you very much indeed for this information. I shall be very glad indeed to get other notes from you at any time that you think you can add anything to what I have to say or whenever you think that I am at fault. I do not pretend to know it all.

I HAVE written Niedner about fitting one of his .25 calibre barrels to my Springfield. I will use the full military stock—hand guard will be rounded at rear end, rear sight will be removed but will retain rear sight band. Will use regular front sight and Lyman No. 48 rear. I have a hankering for a 25- or 26-inch barrel but am not sure yet whether I will change from present length or not.

I will not change butt-plate or present stock length largely on account of using Lyman No. 48 and its being so far from the eye. I intend to use this rifle for target work. Crows and Coyotes up to 250 yards.

I want to use 86- and 87-grain metal jacket bullets and I think 3,000 f.s. velocity will be about right. Now the question is what powder is best?

If it was a commercial 25-35 or 250-3000 I would not hesitate to select DuPont No. 16, but it seems that most writers using Neidner's close chambered rifles have secured best accuracy when using DuPont No. 20. Will you please advise me what would be your choice of powders for such use?

W. B. C., Centerville, Idaho.

Answer: I do not think you can possibly get a better rifle than a Springfield with a .25 calibre Neidner barrel. Be sure that the barrel has the Mann-Neidner chamber, which will make it necessary to use special trued shells which Mr. Neidner will provide but will give you much better accuracy than any other method. A 26-inch barrel is very much better for this calibre, this length just permitting the powder to burn when the full charge is used. For the highest velocity I would recommend that you use the 87-grain .253 bullet made by the Western Cartridge Co. Also I would recommend that with this bullet you use DuPont No. 20 powder, which will give the best accuracy. Mr. Neidner will give you the correct charge. His address is now Neidner Rifle Barrel Co., 612 Spruce Street, Dowagiac, Mich.

I HAVE a Mauser 7.9 chambered for Spitzer bullet 154 grains and will you advise if the blunt nose bullet 230 grains or thereabouts can be used? And if so will the sightage be the same as when used with the 154-grain bullet? I can obtain some foreign 236 and some domestic at 227 and 230 grains, but the M.V. is lessened about 786 according to Newton in his hand book.

Also will you kindly advise me how I may obtain a star-gauged Springfield chambered for the '06 cartridge as I have now three rifles, 6.5 Mannlicher, 7.9 Mauser, and a .35 Rem-

ington automatic but according to your dope in your book, I haven't a real gun among them.

H. F. C., Schenectady, N. Y.

Answer: The Remington Arms Co. advise me that they make 8 mm Mauser ammunition with heavy soft-point bullets and also with the 154-grain Spitzer bullets, both of which are correct for the 7.9 rifle.

Relative to obtaining a star-gauged Springfield, I enclose herewith memorandum of the Director of Civilian Marksmanship, which will give you the desired information.

Please do not get the idea that the Springfield rifle is the only satisfactory rifle for game shooting. You should get excellent results from the three rifles that you now own.

I HAVE read with great interest your No. 1 reply to H. D., Bloomfield, N. J. I would like to ask you a few questions on it.

Is potassium chloride present in all primers? Or rather, is this salt left in the bore in the same quantities from the combustion of all high pressure primers? I use at present, Winchester, No. 35 N.F. As far as I can see, this is a good primer. Frankford Arsenal sent me 2,000 the first of this year. I expect to use U. S. No. 8, as soon as I dispose of these No. 35. Now in your experience, what primer have you found to leave the least potassium chloride salt in the barrel? If I am not mistaken, potassium chloride, or KCl , is a white salt, when pure, similar to sodium chloride, $NaCl$. Does this salt have the same appearance inside the bore as the regular salt? Does it have the same properties? Or is it affected any by the combustion of the powders? This topic is one which a great many riflemen have been interested in and I believe will help them to prolong the life of their barrels if they understand it thoroughly.

Will you give me your advise on a good hunting load using the 220-grain Western Cartridge Co.'s gilding metal bullet, with DuPont, No. 16 powder, in the Krag?

Can you give me any information regarding the new Remington 180-grain hunting bullet? What will they jacket it with?

What primer did Remington use in the 30-06 ammunition loaded by them for the Government in 1918? It is a plain copper primer and, I should judge it to be either No. 8 or No. 8½. Is this a good primer? I have shot about 400 rounds of this ammunition and have found that the primers are very well flattened out but still not excessively. Should a primer flatten out to any great extent?

Is it possible to obtain any .45 revolver and pistol components from the D. C. M. now?

Will you give me a description, if possible as to how breech pressures are determined? A great many riflemen are interested in this and it is hard to find out.

How many new powders are the DuPont people bringing out? I have heard of No. 15½, 17½, 20½ and 25½. Are these right?

Will you kindly give me any data you may have on DuPont Pistol Powder, No. 5 and compare it with Bull's-eye in the .38 Special and .45 Colt D. A.? How does the cleanliness, breech pressure, load, and recoil compare. I

have a little Bull's-eye on hand, but am going to use No. 5 when it is gone.

P. B. S., Portland, Maine.

Answer: As far as I know all of our primers contain chlorate and all develop enough potassium chloride on combustion to completely coat the bore of the rifle. At present there is no use of attempting anything except to wash this potassium chloride out of the barrel in the way indicated. I am frank to confess that I am not enough of a chemist to know the difference between potassium chloride and sodium chloride chemically, but almost any chemist can give you the scientific information.

The load I used with the 220-grain Western Cartridge Co. metal jacketed bullet was 43 grains of No. 16 powder, giving a velocity of 2,200 feet and a breech pressure of 43,800 pound. This showed fine accuracy. Recently a friend loaded up some of this ammunition with 46 grains of DuPont No. 15 powder, and we tried it and got practically the same results but with probably a little more velocity. I know nothing about the development of the 180-grain Remington bullet but presume it will be jacketed with cupro-nickel and have a brass point. To the best of my knowledge this bullet is not yet on the market. Also, I do not know what primer the Remington Company used in their .30 calibre Model 1906, loaded by them for the Government in 1918. The present impression seems to be that the non fulminate or non-mercuric primers are little if any better than the old fulminate primers. The flattening of the primer depends a good deal on the thickness of the brass cap as well as on the breech pressure. As far as I know the DuPont Company do not contemplate any new powder in the very near future and have not yet decided whether or not they will place on the Market the No. 17½ powder used in the last year's National Match ammunition.

I HAVE before me your very comprehensive letter of the 26th, concerning the turning down of Springfield barrel and I note well your remarks about the unsatisfactory shooting of a very light weight barrel; this I well know from an 8 mm featherweight Mauser I have; it will shoot light charges fully 8 inches higher at 100 yards than the full charge, but I still want to make over a Springfield, turning barrel down to the utmost, put a rib on top, fit set triggers, restock and see what kind of a job I can do making a light weight hunting arm.

I also note that you consider the steel used by Springfield Armory the equal to Krupp (so-called) steel. Do you think that I will be safe in cutting Springfield barrel down to the same dimension as the barrel of a Sauer Mauser chambered for the .30-06 cartridge? I expect to leave the barrel around chamber a little larger than the Sauer but would like to cut barrel down as much as possible and then try to stiffen with a rib.

What, in your opinion is the smallest safe diameter to make the barrel at 3, 6, 9 and 12 inches from front of receiver?

Don't want to have the barrel "swell" in my

hand as cannot afford to lose any of the fingers on left side.

G. R. H., Richmond, Ind.

Answer: I think that you would be safe in turning down your Springfield barrel to the same size as the 8 mm feather weight Mauser, leaving, however, a little more metal around the chamber. I cannot recommend it, I simply say I think you will be safe. I am pretty sure that turning down a barrel in this way and then specially putting a rib on top will be very detrimental to the accuracy. As your rifle comes from the armory it should average 5½-inch groups at 200 yards. If you alter it as you suggest I should not be surprised if you will find that it will then average not better than say 12 inches at this range. I do not want to make any statement as to the safe diameter of the barrel. You will have to take your own chances if you turn the barrel down appreciably lighter than the standard barrel.

I HAVE a 250-3000 bolt action Savage and I can hold a three-inch bull's-eye at 100 yards. Last week at a turket shoot I made four straight bulls, shooting from rest at a 3-inch bull at 100 yards. Two shots drove the tack in center of the bull. The man in charge then requested me to stop for a while which I did. Now I am coming to the important part of this letter. In *Rod and Gun* of October, 1915, you wrote a very interesting article entitled "Small Game Rifles—A Study." You had a 25 calibre nickle steel barrel with 14-inch twist made and chambered for the .25 Stevens rim-fire which was a failure. You sent the gun to Mr. Niedner and had it rechambered to take the 25-35 commercial shell with the 86-grain Winchester jacketed bullet and 22 grains of DuPont No. 20 military powder. You got a velocity of 2,250 f.s. and an average group of 1.77-inch at 100 yards. Now why wouldn't I use the same load in the 250-1000?

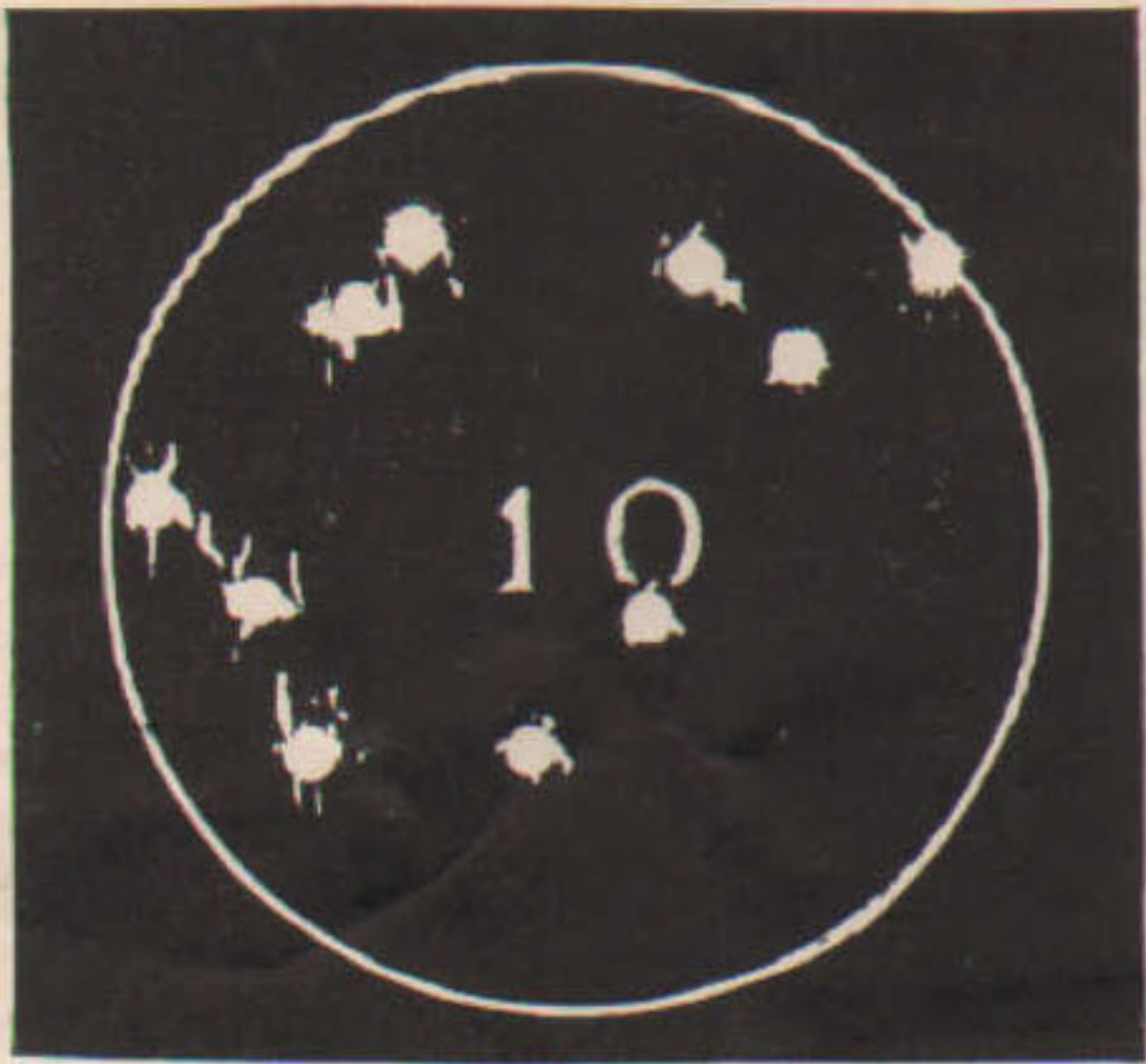
I should think it would take a fine small game load with the full metal patch bullet and the 250-3000 has a 14-inch twist the same as your rifle had. Also for a lighter load, what results do you think I would get with 12 grains of lightning powder and the 87-grain Savage bullet?

I know that you must be a very busy man and undoubtedly I should not write this letter to you, but my excuse is that I am a gun crank and hunting, trapping and target shooting are my favorite pastimes. You know a gun crank is a queer animal and will go to any length to get information.

H. V. H., Newport, Vt.

Answer: I am entirely in sympathy with your scheme for lighter loads in the 250-3000 bolt action Savage. You refer to my experiments with the 25-35 Winchester shell, but you must remember that the 250-3000 shell has a much larger powder capacity and it will take more powder to give the same velocity; also with these high pressure powders you have to develop a certain breech pressure in order to make the powder burn efficiently.

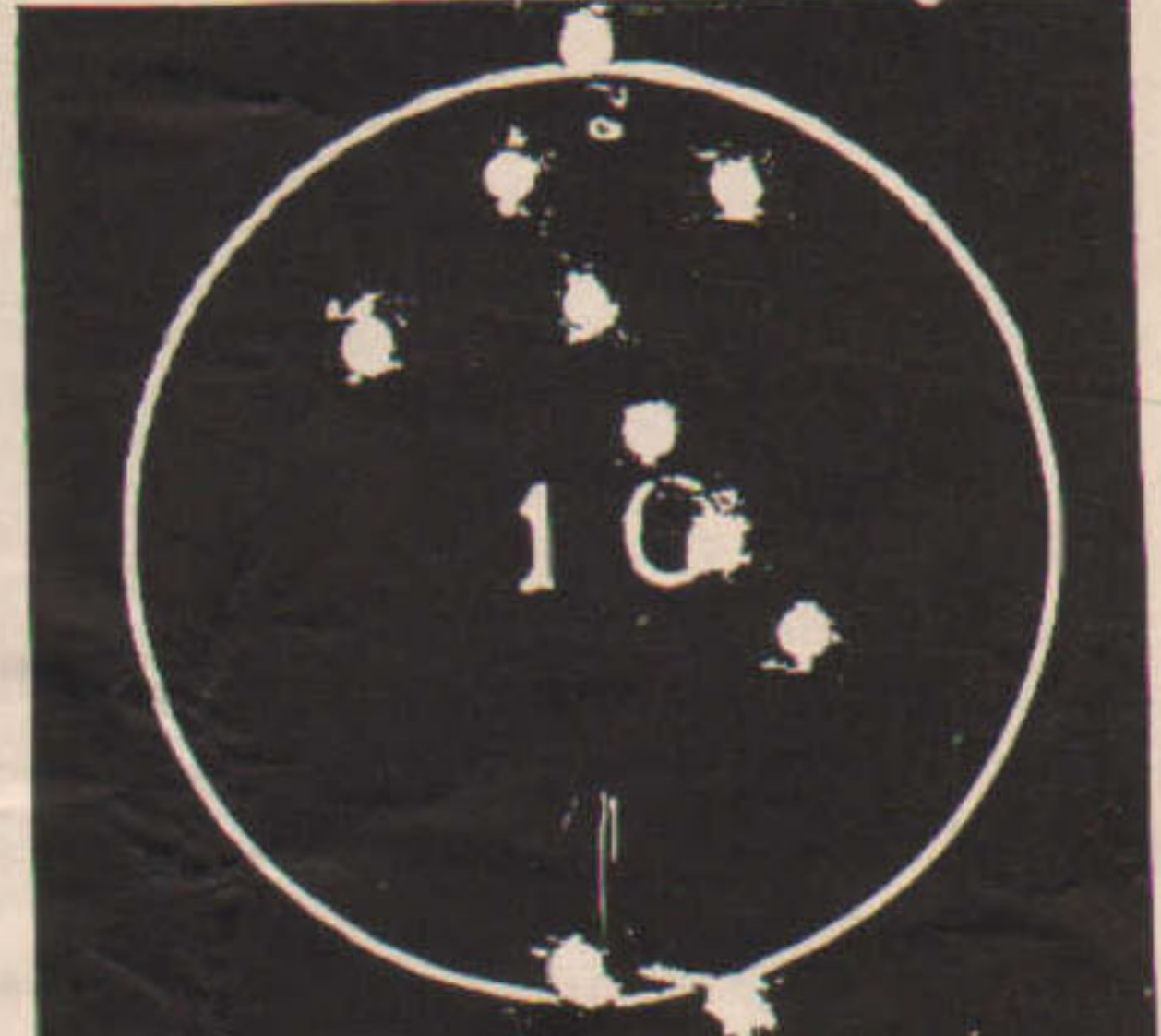
The Western Cartridge Co., East Alton, Ill., can supply you with copper jacketed bullets in either 87, 100, or 110 grain weight, and either full jacketed or soft point.



CENTURY by
L.M.FELT, 111 State Tm
in try out for Inter-
-national Smallbore Tm
Camp Perry 1920, made
with B.S.A. MATCH RIFLE
and U.S. Cartridge Co
N.R.A. ammunition.



CENTURY by
A.H.MADSEN, R.O.T.C. in
Smallbore National
Individual Match, Camp
Perry 1920, made with
B.S.A. MATCH RIFLE.
and U.S. Cartridge Co
N.R.A. Ammunition.



CENTURY by
Lt C.M.BROWN 29th Inf.
in Smallbore National
Individual Match, Camp
Perry 1920 made with
B.S.A. MATCH RIFLE and
U.S. Cartridge Co N.R.A
Ammunition.

B. S. A. SUPER-ACCURACY

A Century is a possible at 100 yards, it represents the last word in accuracy. Above are three Centuries made at Camp Perry, photographed from the original match targets, life size.
B. S. A. Match rifles are now making 3-8 inch groups at 75 feet, and have sights that will place these groups in the centre where they belong.

USE A MATCH RIFLE FOR MATCH SHOOTING—Ideal for the N.R.A. Winter indoor matches

PRODUCTION EQUIPMENT COMPANY

Dept. 24, 5 Union Square, New York

Canadian Representative, Fraser Co., 10 Hospital street, Montreal

To get a light load with high pressure powder, you might start in by trying 25 grains of DuPont No. 20 powder, or 27 grains of DuPont No. 16 powder, or 27 grains of DuPont No. 21 powder. If these do not give you good accuracy it is probably because they are not burning well and the charge should be slightly increased. These charges are for the 87-grain bullet. If you use heavier bullets you will get greater pressure and you may be able to decrease the powder charge somewhat and yet have it burn well. However, with heavier bullets it is possible to decrease the charge so much that the rifling will not spin the bullet and it will tip. You will find the normal and maximum charges for this cartridge given in my book *The American Rifle*.

I would not try the charge of 12 grains of Lightning powder. This charge of powder is too small to burn well. For a reduced load I would strongly advise you to use 12 grains of DuPont No. 80 powder and the 87-grain bullet. I have tried this load out thoroughly in my own rifle, and at 100 yards it gives as good accuracy as I have ever been able to get from even the .22 calibre long rifle cartridge in a match rifle. Also, you will find that this short range cartridge will kill fur bearers neatly, without hurting the pelts.

I RECENTLY ordered some 180-grain Umbrella point bullets for the Springfield rifle, and now want to use them in Krag instead, and want to know whether the bullets are really of different shape, and what, if any, allowance I

shall make for difference in pressure, depth to seat in shell, etc. I ordered U. M. C. bullets.

What pressure would both 38 and 39 grains of No. 16 powder with the above bullet develop? In other words, I want as stiff a load as will be safe in the Krag, as I have a fine Sporter with new star-gauged barrel, and which is very accurate. I am afraid of pressure in excess of 40,000 pounds and want to stay under that limit.

What amount of above powder shall I use to obtain 38,000 to 39,000 pounds pressure with U. S. Cartridge Co. 220-grain S. P. bullets, with same shell?

Please give me maximum load of same powder you believe safe in 1895 model Winchester for both of the above bullets, stating probable pressure.

This Krag has Lyman No. 103 sight on bolt, and the Winchester has a No. 38 receiver.

J. B. K., Gonzales, Texas.

Answer: As far as I know, the 180-grain U.M.C. umbrella point bullet is made only for the Krag cartridge but has been generally loaded by individuals in the Springfield cartridge. For the Krag cartridge it should be loaded so that the cartridge will have the same length over all as the regular factory 220-grain Krag cartridge.

No pressures or velocities that I know of have been taken with 180 grain bullets in the Krag; and in arriving at the data which you want we have to approximate; but from other tests we are able to do this very closely. I should say that 40½ grains of DuPont IMR

powder, No. 16, will give you very close to 40,000 pounds pressure and a velocity of about 2,400 feet per second. With the 220-grain soft point bullet, 38 grains of the same powder should give you a pressure of between 38,000 and 39,000 pounds, with a velocity of about 2,150 feet per second.

For use in the Winchester Model 1895 rifle for the Krag cartridge I should say that the maximum efficient charges would be 42 grains of No. 16 powder with 180-grain bullet; giving a pressure of about 41,500 pounds. With the 220-grain bullet, 40 grains will give a pressure of about 41,740 pounds, with a velocity of 2,232 feet per second.

I HAVE a single shot Remington chambered for the 8 mm Lebel French cartridge. Is there any standard American made cartridge which could be used in this rifle with the aid of an adapter?

E. N., Bridgeport, Conn.

Answer: I know of no standard American cartridge that could be used with the aid of an adapter in a rifle chambered for the 8 mm Lebel cartridge. We have no bullet that is about this size. The maximum diameter of the Lebel bullet appears on examination to be .3265 inches. Our records show the Lebel barrel to have a groove diameter of about .237 inches. This would necessitate swaging up a bullet to fit the barrel.

We would suggest that you may be able to obtain 8 mm Lebel ammunition from the Western Cartridge Co., East Alton, Ill.

WHILE the question and answer department of your magazine is more devoted to rifles, a lot of us boys have got into an argument as to whether a 28-inch shotgun barrel will throw shot as far and effective as a 30 or 32-inch barrel.

If the 28-inch barrel falls short of the 30 and 32-inch barrels kindly advise as to about how much shorter it would be.

If you were using a 5A of 5 power telescope sight on a remodeled Springfield .30 calibre rifle, and this scope had been targeted for 200, 300 and 400 yards and you had to make a shot at 250 or 350 yards, how would you set the sight or hold the gun to make an accurate hit between these distances. In other words you might undershoot at 250 yards if the scope was set for 200 yards and you might go over if it was set for 350. How about it?

D. H., Logan, W. Va.

Answer: I would say that the range of a shotgun with various lengths of barrel depends considerably upon the powder charge and amount of shot used. If these are such that the powder will burn completely in a 28-inch barrel, then you will get no advantage whatever by increasing your barrel to 30 or 32 inches. If, however, the powder does not burn completely in the short barrel, lengthening the barrel would be an advantage.

Generally speaking, a cartridge can be so loaded that a 28-inch barrel will have very nearly as effective a range as a 32-inch barrel, but not quite. The difference is so slight that most men think that the greater handiness which comes with the short barrel more than offsets the slight advantage in range obtained from the long barrel.

Relative to your question about sighting the rifle with telescope sight, if the telescope has been targeted for 200, 300 and 400 yards, and I had to make a shot at 250 or 350 yards, if I knew the range exactly and had plenty of time I would set the sights half way between the determined elevations. If, however, as in game shooting, there was no time to do this, I would have to be determined by an intimate knowledge of the trajectory of the rifle. This knowledge every man should get and must get before he can say that he really knows his rifle. You will find methods of determining this and of making this and other intimate studies of your rifle in my book *The American Rifle*.

THESE Clubs have been admitted to membership in the National Rifle Association of America

Alaska:

Ketchikan Rifle Club, Ketchikan, Alaska. Sec'y, G. S. Talbot, Ketchikan, Alaska. Pres., S. E. Nelson, Vice-Pres., Dawson Cooper, Treas., R. L. Cline, Exec. Officer, R. R. Spaeth. 15 members.

New Jersey:

Hubert Rocke Post, American Legion, No. 264, Rifle Club, Teaneck, Bergen Co., New Jersey. Sec'y, Stephen Palmer, 134 W. 65th st., New York City; Pres., Charles G. Percival; Vice-Pres., Edward Laursen; Treas.,

Charles Rezzanno; Exec. Officer, Cornelius Hart. 36 members.

Arizona:

Morgan McDermott Post, No. 7, American Legion Rifle Club, Tucson, Arizona. Sec'y, Robert R. Davis, National Guard Armory, Tucson, Arizona; Pres., Dr. I. E. Huffman; Vice-Pres., Ray Jenkins; Treas., Richard Nielsen; Exec. Officer, Joe Roberts. 21 members.

Indiana:

Crawfordsville Rifle Club, Crawfordsville, Indiana. Sec'y, W. C. Martin, 307 North Washington st., Crawfordsville, Indiana; Pres., George Hurley; Vice Pres., Dan Offutt; Treas., Charlie L. Owens; Exec. Officer, Walter Martin. 40 members.

Pennsylvania:

David Lupton's Sons Co. Rifle Club, Philadelphia, Pa. Sec'y, J. Ledger, David Lupton Sons Co.; Pres., E. Garforth; Vice-Pres., H. Schaffer; Treas., J. Thornton; Exec. Officer, B. Pollock. 41 members.

BOYS' RIFLE CLUBS

California:

Tulare Joint Union High School, of the First Batt. C.H.S.C., of Tulare. Sec'y, Earle Young, P. O. Box 159, Tulare, Calif.; Pres., Donald Creath; Vice-Pres., Happy Lambert; Treasurer, Kenneth Sturgeon; Exec. Officer, Dale Bonnor. 86 members.

SCHOOL BOYS' CLUBS

California:

San Juan High School Rifle Club, Fair-oaks, California. Sec'y, Clifford Anglim, Repressa, Sact. Co., Calif.; Pres., Laurence Turnbull; Vice-Pres., Bill Stoddard; Treas., Hiram Hendren; Exec. Officer, F. E. Morrin. 56 members.

Connecticut:

So. Manchester High School Rifle Club, So. Manchester, Conn. Sec'y, Kenneth Boland, Manchester, Conn.; Pres., James McLaughlin; Vice-Pres., William Krah; Treas., Joseph Handley; Exec. Officer, Walter Olson. 21 members.

COLLEGE RIFLE CLUBS

Pennsylvania:

Carnegie Institute of Technology Rifle Club, Pittsburgh, Pa. Sec'y, John L. McCullough, care of school; Pres., Carl M. Wolter; Vice-Pres., James A. Pray; Treas., Arlo G. Dornall; Exec. Officer, Hugh S. Torbert. 107 members.

Utah:

Utah Agricultural College Rifle Club, Logan, Utah. Sec'y, H. K. Bullen, 192 E. I. N., Logan, Utah; Pres., John Francis Hayes; Vice-Pres., Verne F. Owens; Treas., Major A. C. Sullivan; Exec. Officer, Major Russel P. Hartle. 15 members.

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WANTS AND FOR SALE

Each subscriber to ARMS AND THE MAN is entitled when his subscription is paid up for one year, to one free insertion of a half-inch want ad in this column.

All he needs to do is to send in the advertisement for insertion at the same time calling attention to the date when his subscription was paid.

OLD-TIME and modern firearms bought, sold and exchanged. Kentucky flint-lock rifles, old-time pistols, revolvers, guns, swords, powder horns, etc. Lists free. Stephen Van Rensselaer, 805 Madison Avenue, New York City.

WANTED—Two Winchester single shot actions, heavy type for centre fire cartridges. Stocks and barrels not wanted. Single trigger solid frame type only. Also Marlin, Model 27 for .25 rim fire cartridges. State condition and best price. Major T. D. Sloan, 41 West Kirke st., Chevy Chase, Md.

FOR SALE—Highest grade Daly 3 barreled gun, 16-gauge x 25-35 rifle. 28-inch barrels, full choke, stock 14 x 2 3/4 x 1 3/4. New condition. Price \$150.00. Niedner remodeled Mauser (short action) rifle for the .35 Remington cartridge, 24-inch barrel, checked pistol grip stock with cheek piece. Lyman sight on bolt. Sling swivels. New, \$80.00. A very accurate 6 3-8 pound rifle. Major T. D. Sloan, 41 West Kirke st., Chevy Chase, Md.

FOR SALE—Colt Officer's Model, .38 cal., 4 1/2-inch barrel, Partridge sights, \$35.00. J. L. Bastey, 657 Washington st., Boston, Mass.

FOR SALE—One .22 Savage N.R.A., new condition, with Stevens 3 1/2 power scope, \$40.00. One Model 1897 Winchester shot gun, fine condition, \$35.00. C. C. Snively, Hopkins, Minn.

FOR SALE—Smith & Wesson pistol, 2 barrels 22-10 inches, 32-6 inches, fine condition, \$20.00. Stevens "Off-Hand" 22-8 inches, new, \$12.00. New set Ideal Tools, double adjustable for .33 Winchester, complete with mould, \$5.00. B. A. Dumser, 35 Grove ave., Elgin, Ill.

FOR SALE—Savage Bolt Action .250-3000. Lyman No. 54 rear. Ross-type swivels. Kerr sling. Shot few times, then properly cleaned. Perfect, \$68.00. E. A. Price, 406 Garfield st., Ft. Collins, Colo.

FOR SALE—One Stevens N.R.A. .22 cal. rifle No. 414, equipped with Stevens No. 338 telescope (about 3 1/2 power) and finest target sights. Factory condition. Also one 38 x 55 Winchester repeater—shot 40 times—like new. Would consider trade for Winchester pump, 12 gauge. Fred R. Shainholts, Menominee, Mich.

WANTED—.22 calibre repeating rifle, chambered for .22 L. R., in first class condition. Full particulars and price to E. D. T. Francis, 105 Sunnyside ave., Ottawa, Canada.

FOR CHRISTMAS—Give yourself a set of Luminous Sights for that .45 Colt Automatic. \$3.50 per set. E. F. Watson, Dumont, New Jersey.

WANTED—2 Winchester single shot actions, heavy type for center fire cartridges. Stocks and barrels not wanted. Single trigger solid frame type only. Also Marlin, Model 27 for .25 rim fire cartridges. State condition and best price. Major T. D. Sloan, 41 W. Kirke st., Chevy Chase, Md.

FOR SALE—One new star gauged Springfield, never fired, with new Winchester 5-2 scope and case, with quick detachable Knobbe mounts, also Marine Corps front and rear sights in extra movable bases. New sling oiler and thong case complete. Fine oil finish stock. Outfit new from butt-plate to muzzle. One star-gauged Springfield sporter, checked fore-end and pistol grip. Lyman No. 103 rear sight on cocking piece. Sheard gold bead front sight, with sling, in gun crank condition. Photos and prices on request. One Remington-Lee .30-40 musket, with Win. scope mounts, extra magazine and sling. Heavy accurate barrel, fine for high velocity loads in Krag shell. A-1 condition, Price \$25.00. One Krag rifle, new, never fired, sling and appendages, price, \$22.00. One Mauser 8 mm, bayonet and extra bolt complete, in good condition, fine barrel, \$30.00. One Mannlicher-Haenel carbine 8 mm sporting stock with pistol grip, 6 clips and 40 rounds of ammunition, fine condition, \$20.00. H. L. Rowe, 4 Normal st., Worcester, Mass.

Peters CARTRIDGES



Bullets That Hit Where You Aim

Among the elements that go to make up accuracy in ammunition, none is more important than the bullet itself. Even though all other component parts of the cartridge be properly constructed, a bullet which is imperfect in the slightest degree will eliminate all chance of perfect results.

The bullets in Peters Ammunition are not only right in calibre and other external characteristics, but they are right inside. They are made of metal of special composition, and produced by a Peters method which insures *even density throughout*. In shooting this means that when the bullet leaves the rifle barrel it will rotate about its axis and will have no tendency to revolve about a center which is not the exact center of the bullet. In Peters bullets, the center of gravity is located on the axis, or center of spin. The metal is evenly balanced about this lateral axis. Peters bullets do not wobble—they travel straight to the mark.

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U.S.C.Co. N.R.A. Long Rifle
Ammunition
B.S.A. No 12 Match Rifle
Shot by L.J.Corsa
Brooklyn Rifle Club
Tenafly Oct 3 1920


Is This a Better 100-Yard Group?

This is submitted to us as a rival of Townsend Whelen's Group which we reproduced on the cover of November fifteenth "Arms and The Man." This group, like the other, was shot with

 **.22 N. R. A.**
Long Rifle Lesmok Cartridges

At 75 feet these same shots would have made a group like this



 .22 N. R. A.'s are the cartridges to use on the indoor range this winter. They excel at 25 yards as at 100 yards.

UNITED STATES CARTRIDGE COMPANY

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