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TRIGGER TALK

ANOTHER WINNER!

John Lingerfeldt of Asheville, No. Carolina, is the lucky winner of a new Savage Model 99-C rifle, offered in our January issue. Our congratulations!

* * *

I had occasion the other day to have dinner with a traveller from Europe with no interest in guns, and during the talk about politics, European economy, etc., he was asked to name Americans who were well known in Europe. The usual names you would expect came out, but interspersed were several names which are all but unknown in the U.S.—except among gun enthusiasts. One was Gary Anderson, another was Lones Wigger. The salesman told us that if you would stop 10 people on the street in Europe, at least six of the 10 would recognize these names as greats in American shooting. Try these names on the next ten people you meet—who are not shooters. Verrrry interesting.

* * *

CQ CQ CQ CQ CQ CQ CQ CQ

Attention all gun nuts who are also Hams, or amateur radio buffs. Ye editor would like to hear from you, with your call sign, operating band, and special gun interest, if any. There are a lot more radio/gun buffs than even I imagined, and perhaps we can get something going if the response is encouraging.

* * *

Words of wisdom (?) from Senator Joseph Tydings: "If we had a (gun) licensing system, criminals, addicts and lunatics would be cut off from legal supply channels for firearms."

That's about the same as saying that if we had a licensing system for legislators, we could stop them from making stupid statements. Wish it were that easy.

THE COVER

Ruger's versatile .357/9mm convertible revolver, shown here with suede lined holster and belt by Safariland, and custom ivory grips by Jerry Evans of San Jose, Calif. Photo by Gene Lovitz. See his article on page 18.

MAY, 1970

Vol. XVI, No. 0-05

George E. von Rosen
Publisher

Guns

FINEST IN THE FIREARMS FIELD

CONTENTS

FEATURES

REACTION IN VIET NAM News from an old friend.....	George E. Virgines	6
RUGER CONVERTIBLE Now shoot three different cartridges from one gun.....	Gene Lovitz	18
REPEAL THE GCA '68 News on what is happening around the country.....		21
GUNS OF COWBOYS A look at cowboy hardware, past and present.....	Col. Charles Askins	22
THE A & W DIVERter The technical aspects of this new device.....	James D. Mason	24
HAWKEN RIFLES, PART I Two brothers teamed-up to make these greats.....	E. L. Reedstrom	26
THE RIGHT AND THE JOY One man's views of the shooting game.....	Nameer Jawdat	29
THE .32-20 Considered obsolete by many, it still has charm.....	B. R. Hughes	30
GUNS WITH WINGS The role of aircraft machine guns in war.....	Maj. George C. Nonte	32
LYMAN SHOTSHELL HANDBOOK An indispensable guide for the handloader.....	Mason Williams	36
HISTORY OF AUTO PISTOLS Milestones in the designs of automatics	James B. Stewart	37
FREE GUN CONTEST Win a free Weatherby Mk. XXII .22, with scope.....		77

DEPARTMENTS

Shooters Club of America.....	5	Gun Rack.....	16
Handloading Bench.....		Pull!.....	46
..... Maj. George Nonte	8	Shopping With Guns	60
Questions & Answers.....	10	The Gun Market.....	73
Point Blank.....	12	Index to Advertisers.....	75
Our Man In Washington.....	14		

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News from the...

SHOOTERS CLUB OF AMERICA

Dedicated to the Constitutional Right of Every Citizen to Keep and Bear Arms

Have you ever noticed the hoard of Washington "aids" who surround every public figure in our capital like so many bees to honey? They are non-elected, non-regulated and many are non-answerable to the voting public. There are some honest "advisers" in Washington, but there are also many "advisers" who are only interested in money and power.

These dishonest Washington Bureaucrats are plotting to disarm the upright honest American citizens so the organized criminals can have even more freedom to operate. This very disastrous design has been developing because the forces of national crime have promised the corrupt Bureaucrats many hundreds of millions of dollars.

The pattern is clear; every year these Bureaucrats push for more and more laws to protect the rights and safety of known criminals. Every year there are new Supreme Court rulings for the well-being of organized crime. And during this same time the aboveboard and right-minded Americans like you are chained with unconstitutional gun laws.

If the criminals ever disarm the general public then they will have a never ending source of easy money. The money will be used to bribe even more Bureaucrats for new laws that are favorable to the criminal. Which will lead to even more money and power for those people who want all the guns for their own dishonest use.

These dishonest Washington Bureaucrats are a determined group who will let nothing stand in their way. An honest person working for the average American gun owner and who is interested in good legislation, might be blackmailed and double-crossed. And before he knew what was happening he would be forced to leave Washington and his reputation would be permanently and completely ruined.

The pattern is clear; to successfully protect our national constitutional right to keep and bear firearms you need a national organization. And THE SHOOTERS CLUB OF AMERICA is the organization that can concentrate the effort needed to protect our constitutional rights.

During the last few years the federal legislative body has gone overboard in proposing bad and unnecessarily hard gun legislation. These laws have bothered the honest citizens. But have only helped the professional criminal who remains untouched. THE SHOOTERS CLUB OF AMERICA wants to alter our suicidal course, but it will require a great deal of sacrifice on the part of the people concerned with this problem. A good start has been made by THE SHOOTERS CLUB OF AMERICA but to continue with this important work we need the help of many more people dedicated to the cause of keeping America free.

If the criminals know that you are doing your part to look after and protect your constitutional rights, then we will be on the road to recovery. THE SHOOTERS CLUB OF AMERICA needs your help, and you need the help of S.C.A.! We can work together to defeat unworkable and unreasonable laws. We can uncover the true story of present attempts to disarm the American public. And we can expose the true motives of those Washington Bureaucrats who are always on the wrong side when it comes to new laws.

JOIN THE SHOOTERS CLUB OF AMERICA TODAY!

We must be able to present the facts of our position to the American public. This can only be achieved with a strong national organization that has the means to mount a public relations campaign for the honest gun owner. Now is the best time to act, put your name along side thousands of our other members who are working for the preservation of life and free society. Use the attached postage-free envelope to enter your membership in the S.C.A. DO IT NOW

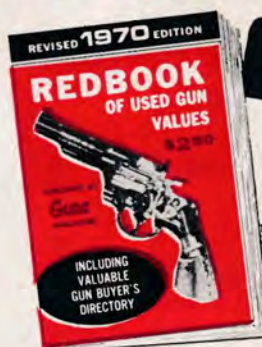
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REACTION IN VIETNAM

By GEORGE E. VIRGINES

ONE OF the prime attributes in the sport of Fast Draw is a shooter's reaction. Reaction to the signal to draw and fire can make the difference of winning or losing by the bare fraction of a second. Who would know this better than a Top Gun Fast Draw Champion, Ron Mossholder of California, and now an Excavation Superintendent for a road construction company in Vietnam.

It is to Ron's credit that his experience to a fast reaction was responsible in the saving the lives of two United States soldiers in Vietnam. Attesting to his courage, Ron Mossholder was presented a Certificate of Appreciation from the Department of Defense—United States Military Assistance Command, Vietnam. Quote: "Awarded to Mr. Ron Mossholder for distinguishing himself during October 1968 while working near Phan Rang in the Republic of Vietnam, by fearlessly exposing himself to danger while coming to the aid of two American soldiers. Mr. Mossholder witnessed a United States Army truck go out of control, slide down an embankment, and burst into flames entrapping the individuals in its wreckage. Without hesitation and with complete disregard for his personal welfare, Mr. Mossholder demonstrated great courage and determination in extracting the soldiers and moving them to a position of safety. The lives of the two American soldiers were saved as a result of Mr. Mossholder's valorous deed, and his action on this occasion brought him the highest laurels of distinction.

Date 26, October, 1968, Saigon, Vietnam—Signed—Creighton W. Abrams, General, United States Army."

I'm sure many of Ron's old shooting buddies of Fast Draw will be as pleased and proud of his exploits, as I.

Before going to Vietnam, Ron had contributed greatly to the advancement and promotion of Fast Draw. Many will remember him also as founder, publisher, and editor of Top Gun Magazine devoted to the sport. He was an active shooter, winner of over 500 trophies, and holder of many outstanding fast draw records. He was a great supporter of fast draw. He spent his spare time lecturing and demonstrating, both on radio and television; bringing members, clubs, and associations closer together; and influenced the standardization of rules and regulations governing the sport.

Although he has traded his Colt Single Action .45 for a M16, he still hasn't forgotten his Fast Draw days. In fact, all of this startling news came about because friend Ron just happened to see the book "Saga of the Colt Six-Shooter" in a USO Club in Saigon. Right then and there he decided he had been out of touch with Fast Draw too long. So any of his friends who would



like to write can contact him at this address, Ron Mossholder, c/o RMK-BRJ, 10.27, APO 96243, San Francisco, California.

I'm sure he'll be glad to hear from anybody from Fast Draw and he certainly deserves a real salute from all.





CHRIS HANBURGER,
Star Washington Redskin Linebacker
And Second Generation NRA Member, Agrees:

Shooters Beware!

**If ever there was a time when
 you needed NRA to help protect
 your present and future
 shooting rights . . .**

That Time Is NOW!

Don't let's kid ourselves, Mr. Shooting Enthusiast! There are powerful forces—possibly well-intentioned, but ill-informed—working eagerly and relentlessly to curb and eventually to abolish the sports shooting rights, privileges and freedoms that you enjoy today!

Between you and that threat stands NRA.

As it has over the past 99 years, the big, strong, million-member National Rifle Association, acting in close concert with other leading non-profit organizations, is waging a continuing battle to preserve and protect, for now and for the future, the shooting rights, privileges and freedoms that many sportsmen take for granted.

But it is highly dangerous to take what we consider an "inherent" right for granted these days! The opponents of individual freedoms press forward on every front. In the name of "gun control" they are waging an insidious war against the rights of *you* and every other responsible, law-abiding sports shooter and hunter!

How you can help NRA protect your rights:

If you really value the protection that NRA is providing the shooting enthusiasts of America, you can express your support by becoming an active, cooperative NRA member. Your really insignificant dues—only \$6 a year, or 50¢ a month—will help finance, on a continuing basis, the National Rifle Association's strenuous and productive efforts in behalf of your best shooting and hunting interests! **The time is NOW!**

In order to meet its responsibilities to America's shooters and hunters, NRA has set as its goal for 1970, one new member every minute, around the clock and around the calendar. Just as you need NRA, NRA needs you—now! It is in your own interests that "NRA has to win it—one new member every minute!"

So why don't you fill out, clip and mail the coupon application for your NRA membership right away—while the matter is still fresh in your mind and before the clock ticks away another minute. Your action today can help assure your future freedoms!

THE NRA PROGRAM: To consistently and continuously promote better conservation, better game management, better education in shooting skills and firearms safety, the development of better shooting equipment and the protection and preservation of the rights, privileges and freedoms of America's law-abiding recreational shooters and hunters. These are the worthy ends towards which the National Rifle Association has pressed for 99 years.

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HANDLOADING BENCH

By MAJ. GEO. C. NONTE

JUST RECENTLY, I believe, I spent time and space describing the new Norma 110-grain high-velocity, hollow-point .38 Special load as well as the bullets for same which are now available to thinking handloaders. At that time I hadn't studied the latest Norma Loading Data booklet closely enough to note that factory loaded performance may be very nicely duplicated with Norma 1020 powder. E. H. Sheldon, President of Norma-Precision brought this to my attention as soon as he had read my remarks. My apologies, Evan.

So, you may use 12.6 grains of N-1020 powder with the Norma 110-grain hollow-point to produce 1542 fps in a six-inch test barrel. That places the .38 Special right up in the Magnum class, especially when we consider that nearly all .357 Magnum performance figures are quoted from 8 3/8" barrels. The chamber pressures for this load are surprisingly low, quoted by Norma at 18,600 psi—well within the design limitations of any good domestic solid-frame revolver and not exceeding operating pressures of the old .38/44 and other domestic high velocity .38 Special loadings.

Norma 1020 powder is a relatively new item introduced only within the last couple years. It is intended primarily for magnum-type loads in cylindrical cases. It meters well through any good powder measure and produces good pressure-velocity relationships. For those of you who haven't had the opportunity to examine its possibilities, we suggest that you pick up the latest Norma Loading Data Booklet that shows at the upper limits of acceptable chamber pressure the .357 Magnum will produce over 1700 fps with a 158-grain bullet. That should certainly be adequate for anything one would ever really want to bust with a one-hand gun. No .41 Magnum data is yet available.

• • •

Back when the Texas Turkey and Deer season was getting off to a roar-

ing start, I had the privilege of attending the 1969 Remington Gun Writers' Seminar down at the Y-O Ranch, just a long pony-ride northwest of San Antonio. A book could be written about the score or so of powder-burning scribes who attend that annual affair, but we won't go into that now.

There, Remington announced something: innumerable handloaders have been plugging for many a year factory standardization and loading of the venerable .25-06 wildcat cartridge. It would be hard to determine just who first necked the .30-06 case down to .25 caliber, but it seems to have been done even before WWI. In spite of the fact that numerous versions have been made and touted over the years, Remington chose to produce the oldest. It is simply the '06 case necked down to hold .257" diameter bullets without any other change. Shoulder angle remains the same, 17 degrees and 30 minutes, and case body dimensions are the same as for the '06 and .270 Winchester. In fact, the same headspace gauges may be used for all three calibers.

Of course, existing loading dies and rifles may be used with the new factory loads—providing they were made for the so-called "standard" or "Neider" version. Naturally, those variations which have altered shoulder angle, neck length, body taper, etc. won't interchange. I suspect, though, that most .25-06 guns in existence have the standard chamber.

As a handloading proposition, this "new" caliber is ideal. It holds as much powder as anyone in his right mind will want to burn behind a .257" bullet—that is, about 58-60 grains. It won't digest that much except of the very slowest-burning types, so don't consider that a load recommendation. Components are a breeze. There are already well over a dozen fine .25 caliber bullets readily available, ranging from stubby 60-grainers to 120 in factory persuasion, with even heavier weights available from some of the

smaller custom makers. In my own personal opinion, the .25-06 is at its best with slimly-pointed bullets weighing no less than 100 grains, no more than 120. The lighter is plenty fast and flat for superb work on varmints at any reasonable range, yet more than potent enough for medium-size big game when of the proper design. For the bigger beasties, that is, anything in North America except the big bears, the 120-grain projectile has the power and penetration to do the job well. For ultra-long range work, I believe I might try the Sierra 117-grain boat-tail; for less distant shots and maximum penetration, it would be hard to beat the 115-grain Nosler Partition bullet at a wee bit over 3,000 fps.

We have a plentitude of powders and primers to use with this cartridge and anyone who worries about brass should have his head examined. There is hardly a handloader in the land who doesn't have a bushel or so of good military .30-06 cases hidden away in a corner somewhere. One, perhaps, two, depending upon the neck anneal, passes through the proper die(s) will produce fine .25-06 cases at very little cost. Usually the '06 will squeeze down to .25 in one pass through a full-length die without difficulty. Should you encounter some that won't, just run them through a .270 Winchester die first—but back it out of the press a quarter or half-turn first, so as to be assured of correct headspacing (head/shoulder length) when finishing the job in the .25 die.

Over the years I've owned several .25-06 rifles, so here are some loads that have turned out well. All were loaded with standard, not magnum, primers and in reformed military '06 cases. See table at right.

The above are all top loads, with the exception of number 7, and should be cut back at least five percent to start in your rifle. This is particularly true if you have an older gun which might contain more variables of chamber and barrel than we normally expect today.

...

Incidentally, the current Remington factory load with its 87-gr. POWER-LOKT bullet, produces 3,500 fps at the muzzle, with a 200-yard mid-range trajectory height of only 1.4" (above iron line-of-sight). Reproduced here are the rest of the performance figures just released.

Though only the 87 grain bullet is offered at present, we fully expect to see other weights available in the not-too-distant future, beginning with a pointed 100 grain design intended mainly for big game.



NONTE'S .25-06 LOADS

- 1) 75-gr. HP—44.5 gr. IMR 4064—3,400 fps.
- 2) 87-gr. SP—52.0 gr. IMR 4350—3,350 fps.
- 3) 87-gr. SP—60.0 gr. H4831—3,500 fps.
- 4) 100-gr. SP—57.0 gr. H4831—3,375 fps.
- 5) 100-gr. SP—52.5 gr. IMR 4350—3,250 fps.
- 6) 115-gr. Nosler—55.0 gr. H4831—3,100 fps.
- 7) 117-gr. RN—41.2 gr. IMR 4320—2,800 fps.
- 8) 117-gr. RN—50.0 gr. IMR 4350—3,000 fps.
- 9) 117-gr. Spitzer BT—54.0 gr. H4831—3,100 fps.
- 10) 120-gr. SP—54.0 gr. H4831—3,100 fps.

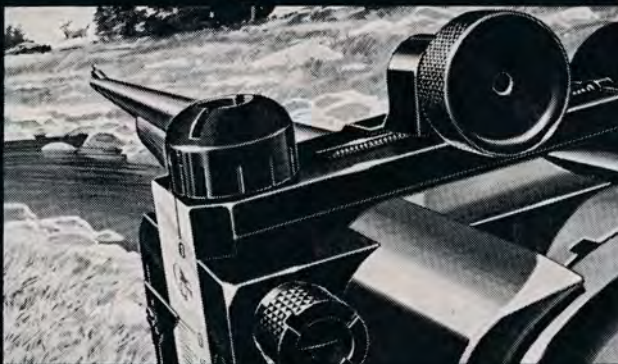
DOWNRANGE BALLISTICS OF 25-06 REMINGTON* 87 Grain "Power-Lokt" Hollow Point Bullet

Range (Yards)	Velocity (Ft.-Sec.)	Energy (Ft.-Lbs.)	Trajectory (inches)** Sighted in at 200 Yds.
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100	3070	1820	+ 1.4"
200	2680	1390	(Zero)
300	2310	1030	- 6.3"
400	1990	765	-19.2"
500	1690	550	-40.9"

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Panel of Experts

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1. Each question should be sent directly to the panel member best suited to solve your problem. Mail questions directly to the expert at the address shown below.
2. Each question—only one question per letter, please—must be accompanied by a self-addressed stamped envelope and \$1.00.
3. You will receive the answer to your question directly from the expert. Our panel will select the most interesting questions for publication in this column, but you don't have to wait for the magazine to get your answer.
4. Letters with questions which do not have \$1.00 **will be disregarded**; those without a self-addressed envelope will be answered in the magazine, and **not directly**.

We have enlarged the staff of our Panel of Experts to give you the best possible service on your questions. Remember, write directly to the expert at the address below—do not send questions to GUNS Magazine—and be sure to include the \$1.00 and the self addressed envelope.

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Shelley Braverman—Modern Arms; Forensic ballistics

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208 W. Fifth, Dept. Q, Colville, Washington 99114

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Dick Miller—Trap & Skeet

Casa Correo Sta., P.O. Box 21276, Dept. Q, Concord, Calif. 95421

Smokeless in a ML?

I own a copy of the 1851 Colt .36 caliber revolver made by EIG in Italy. Is there any smokeless powder for this type of shooting and what load may be used instead of black powder?

Austin Crow
Gainesville, Ga.

There once were "bulk" smokeless and "semi-smokeless" powders which could be substituted for black powder in muzzle loaders, but the ones I refer to have not been made for many years. It is downright suicidal to use standard smokeless powders in any muzzle loaders, regardless of when these were manufactured. The only exception to this is the "duplex load"—a tiny amount of smokeless in back of a reduced charge of black powder—to shoot a little cleaner. Still, only certain powders are permissible, in very critical quantities. The benefit is dubious, and the National Muzzle Loading Rifle Association has advocated **BLACK POWDER ONLY**.

Since it is still just as necessary to clean afterward, I would certainly recommend sticking to the basic rules. Otherwise, what is the purpose of taking up muzzle loading, if the traditions are not of interest?—R.O.A.

Adapter Tubes

I am relatively new at the skeet game and since I am a left-hand shooter the Browning O/U is a natural for me. I would like to branch out into other gauges, namely 20, 28 & .410 but I don't know whether I should go into the adapter tubes for the other gauges or get interchangeable barrels or separate guns. What would be the advantages or disadvantages of these choices?

R. A. Parrish
Augusta, Ga.

As your letter indicates, the choice between gauge adapter tubes, extra barrels, and individual guns in each gauge varies according to the individual. Use of adapter tubes allows the shooter to fire all his targets with a

gun of almost identical weight, feel, swing, etc.... Extra barrels in the other gauges come close to that ideal balance and swing. For many shooters, switching to another gun is a real problem. More or less as I have listed them, I would rank your choices in order of tubes, extra barrels, and last, the separate guns. For what it's worth, I shoot better .410 scores with a 12 ga. and .410 adapter than I do with any .410 gun. You might try this test for yourself, before making a decision on one of the three alternatives.

—D.M.

6.5 Arisaka Conversion

In the interest of longer range and flatter trajectory, can the 6.5 mm Arisaka rifle be re-chambered to handle the 6.5 Remington Magnum cartridge? What difficulties would have to be overcome in this conversion?

Roland Alexander
Warren, Mich.

I would advise against rechambering the 6.5 Japanese Arisaka rifle to the 6.5 Remington magnum. The Jap. barrels are rather small in the chamber area and there can be some question as to the safety margin the larger belted case chamber would leave. The bolt face and extractor would have to be altered to accept the larger case, —and almost certainly some magazine and feeding rail alterations for proper feeding, would be required.

In addition, a proper safety for the Jap. rifles, along with a good trigger, is expensive, and the military barrels are usually not of accuracy standards that merit all this work and expenditure.

If I were interested in a flatter-shooting rifle I would start with a Mauser M-98 or FN action and consider the .25-06 or 6.5 x .30-06, rather than the short stubby-necked 6.5 Remington magnum, which is not easy to reload because of the inability of the short neck to hold deep seated long bullets. There isn't much you can do to improve the existing Jap. 6.5 ballistics. Many were however converted to the 6.5 x .257 Roberts,—but the gain is limited and Roberts cases are difficult to obtain.—W.S.

S. & W. Barrel Change

I have a S & W Combat Masterpiece with a 2" barrel and would like to have it changed to a 4" barrel. What parts do I need and could you suggest someone to do this work.

J. A. Kinlaw
Lumberton, N. C.

The Smith & Wesson Arms Co. 2100 Roosevelt Avenue, Springfield, Mass., is probably one of the best places to

have the barrel on your Combat Masterpiece .38 special changed. You can write them in advance for particulars, but you will have to get a licensed dealer to make shipment of the gun for you,—and upon completion of the work at the factory, they in turn will return it to your licensed dealer. As far as I can determine, a barrel is all that will be needed.—w.s.

Lee-Enfield Rifle

I have an Enfield rifle and would like to identify the manufacturer if possible. It is marked "MA Lithgow S.M.L.E. 1941." I would also like to know if it is safe to use commercial ammo with the gun.

Don Evans
Falls Church, Va.

Your Lee-Enfield Rifle is the "Rifle Number I Mark III*." It was manufactured at the Lithgow Arsenal in Australia in 1941. The Lithgow Arsenal produced 415,800 such rifles from 1939 to 1955. Over 2,000,000 were produced at the British Arsenal at Enfield Lock. Any standard commercial or military cartridge labeled ".303 British" is correct for use in this rifle.—G.N.

.45 Auto Work

I have two .45 auto pistols. One is an original Union Switch & Signal and the other is an Argentine that shoots perfectly while the U.S. & S. shoots high and to the left. I would like to install target type sights for hunting but I don't know which gun would be most suitable for this conversion. What is the difference between the two guns?

Charlie H. Smith
Northlake, Ill.

For all practical purposes, your two .45 caliber Automatic pistols are identical. The U.S. Ampersand S. is doubtless of M1911A1 type, while your Argentine model may be of M1911.

The U.S. Ampersand S. is probably the most valuable of the two, providing that it is an original gun produced by that firm and not just another "made-up" gun fitted with a slide bearing those markings. Whether the gun is fully original can be determined only by close examination and evaluation of the serial number.

Since you seem to prefer to keep both guns in as near as possible original condition, why not simply obtain a spare slide and barrel and fit target sights to it. You can then assemble the target-sighted unit to which ever gun you prefer to shoot without destroying the originality of either.—G.N.



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By COL. CHARLES ASKINS

IT IS GOOD campfire sport to speculate on our greatest sportsman. Virtually everyone has his champion, some of them of truly international stature and others of purely local renown. Some harken back to Daniel Boone and others are staunch backers of Teddy Roosevelt or Buffalo Bill. We have at least two contests annually when the sportsman of the year is designated. Weatherby holds one contest and Winchester-Western has another. There isn't a hunter's "Hall of Fame" or we could go look over the roster and see who really rates the top honors.

Some far-trekking huntsmen shoot from one continent to the other, almost continually on the go. Their game bag at the end of a year is a fantastic thing. Others concentrate on one species to the exclusion of almost all other species and these latter sportsmen are more selective and maybe even more to be admired. John Buhmiller is one of these latter hunting men.

Buhmiller is one of our most successful rifle barrel makers. He has been in the business a long time and used to specialize in turning out match tubes. John has quit now but his barrels are still remembered with nostalgia and no little awe. They were just that good.

Commencing in 1955, Buhmiller made his first African safari. Since then he has returned some five or six times. The first hunt was typically a dude hunter's soiree. He was in the bush for only three weeks and shot the usual safari trophies. These to include a single elephant. This hunt fired his imagination and the very next year he returned. This time he remained for 2½ months and he went down in Tanzania and there went to live on the farm of a British settler, C. G. Thom. This man was a big land owner and an ardent sportsman. He took Buhmiller out for elephant and buffalo. As long as they shot on Thom's estate the game laws did not hold. Elephants were causing a lot of damage to Thom's crops and quick to

see that the American held keenest zest for the dangerous sport of stalking the lordly pachyderm. Thom went to the Tanzania game dept. and got permission for Buhmiller to hunt as a control hunter. This meant he could shoot elephants and other marauding game such as buffalo and rhino whenever he found damage being done. During the 75 days our barrel-maker was in the bush he accounted for 23 tuskers, 25 buffalo and 7 rhino.

The year following, it was 1959, John returned to Africa. And again he lived with his friend, C. G. Thom and stalked elephants. This visit also stretched into 2½ months and during that intensive period, Buhmiller, who was then more than 60 years of age, hunted every day. He accounted for 81 elephants, 5 buffalo but no rhino. In 1960 he went back again. This time the score was 50 elephants, 5 buffalo and 8 rhino. This made for our gunsmith-turned-control-hunter a grand total of 155 tuskers, 37 buffalo and 15 rhino. No American sportsman, whether one of the winners of the outstanding sportsman award or whoever has ever faintly touched this number of elephants killed.

Since then Buhmiller has returned to Africa for two more safaris. He has finally run up his total kill on the great game to 176 tuskers. He has added several more buffalo but no more rhino. The latter have grown too scarce. Political changes in East Africa have come about since Buhmiller hunted so intensively and the possibilities of shooting any more of the farm marauders is now pretty well gone. It isn't likely that the grand tally rung up by our barrel-maker is apt to be surpassed.

John Buhmiller is a great student of the rifled tube and an inveterate experimenter. With a vast background in gun building, a lifetime of experience at reloading, and the enviable possibilities of the African bush to give full play to his instinct for test and experiment, our huntsman has developed a more detailed knowledge of the gun and load that is needed to

knock down the gigantic game of Africa. He has written me about his rifles and loads and I would like to pass along some of this data. It is indeed fascinating reading.

"One of the most logical wildcats is the .450 Watts Magnum, which uses a casing with a straight taper, and one can interchange the .458 Winchester Magnum when you like. Then comes the .450 Ackley Magnum, which holds a mite more powder. I have used a version of my own which closely approximates the Ackley, in .450 caliber, and found it quite satisfactory. One thing that occurred to me while shooting it was that elephants being

noticeably better in eliminating mauling elephants than the .458 caliber. This same bullet has been successfully loaded in the .460 Weatherby case expanded to take the larger diameter. For my shooting I prefer the smaller Norma cylindrical brass, which gives me six rounds in the magazine (Brevex action) which is better than the larger cartridge with three rounds in the magazine and one in the chamber. Many times I have found it necessary to empty one rifle and then waste time switching to another, or be forced to hand load single cartridges thereafter. What the elephant control hunter needs is a 10-shot magazine



Two buffaloes killed with one shot. The cow was directly behind the bull.

the main target, using either Winchester or Hornady solids, which have very thick and sturdy steel jackets, there was literally too much penetration, the bullet going through old Tembo's skull and out the other side. It seemed to me it would be better to use a larger caliber, which would give more shock with less penetration. I made up what later came to be called the .460 Weatherby by expanding the neck of the .378 Weatherby Magnum case to take the .458 bullet. I used this cartridge successfully on elephant, buffalo and rhino before it was ever announced by Weatherby. My load for this first .460 was 100 grains of DuPont 4320 powder which was considerably less than full capacity, but all the power I needed.

"I tried the .475 caliber later and it is really my favorite of all the large calibers I have tried. It is a natural for Norma cylindrical brass, just a slight necking down is all that is needed to load the .475 bullet. I regularly use 90 grains of 3031 powder and the 500-gr. Kynoch bullet, as made for the .470 express cartridge as in English double rifles. This bullet measures .474" and I have found it

arm, then he could really do things! The seven shots I get with the .450 Watts Magnum, or the .475 with straight Norma brass is at times a real advantage. Otherwise the .475 on the Weatherby brass would at times be awfully worthwhile, as when trailing-up a wounded tusker where you need a real blockbuster to bring him down.

"Last year I made up a .500 caliber

(Continued on page 48)

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OUR MAN IN WASHINGTON



By CARL WOLFF

The boys in the Alcohol, Tobacco, and Firearms Division of the Internal Revenue Service have come out with a much-needed book. It is a visual aid for classification of firearms and destructive devices under Title II of the Gun Control Act of 1968.

The weapons described come within the purview of the National Firearms Act. Such weapons, regardless of any operating condition termed serviceable (operable) or unserviceable (welded, parts missing, etc.), must be registered with the Director, Alcohol, Tobacco, and Firearms Division, Washington, D. C., in order to be lawfully possessed.

Weapons which were formerly classified as deactivated war trophy firearms, and widely known as "DEWATS" are included under the Act and must be registered; this same requirement applies to frames or receivers of such weapons.

The only exception to the registration requirement for all firearms defined by the National Firearms Act applies to weapons possessed by or under the control of the U.S.

Some real collectors items are included. However, it is a violation of the Act to transfer firearms of this type without first having obtained the approval of the Director of the ATFD for such proposed action.

It is also against the law to alter, reactivate, or put parts of such weapons together. By "transfer," it is meant any selling, assigning, pledging, leasing, loaning, giving away, or otherwise disposing of. And, the possession of sufficient parts, even though not assembled, to make a firearm, constitutes possession of a firearm.

It is a responsibility of the possessor of any National Firearms Act firearm to be able to produce proper documentation of the lawful registration of such firearm. The Act imposes a tax on the marking or transfer of firearms; this tax is \$200 on all firearms except a weapon classified as "any other weapon," in which case the tax is \$5. However, an unserviceable firearm may be transferred as a curio or ornament without payment of the transfer tax under such requirement as prescribed by regulations issued by IRS, but they must be registered.

Unregistered firearms or destructive devices, regardless of serviceability are contraband and are subject to seizure; in addition, any vehicle, boat, airplane, etc., used to conceal or transport such "contraband" firearms is subject to seizure and forfeiture under the provisions of the Act of August 9, 1939.

Listed in the book also is the address and telephone number of all Regional and Branch Offices of the Alcohol, Tobacco, and Firearms Division of IRS. The publication, "Department of the Treasury, Alcohol, Tobacco, and Firearms Division Publication 674 (10-69) can be ordered from the Superintendent of Documents, U.S. Government Printing Office, Wash., D.C., 20402. The price is 25 cents per copy.

Listed are some of the weapons in the book, along with the amount of transfer tax required:

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(continued on page 15)

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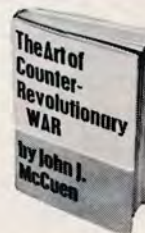


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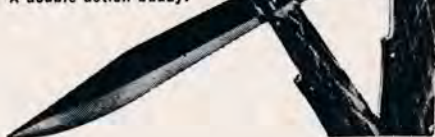
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THE COBRA

A double action buddy!



GUN RACK

Model 1100

The most popular skeet gun among shooters who follow the skeets wars is the Remington Model 1100 automatic shotgun. This gun wins more matches, features more long-run records, and is seen more frequently around both tournaments and practice fields than any other. Just why the 1100 is such a whiz at breaking the clay targets is not easy to explain. It runs to conventional weight, has a stock with common measurements, patterns well but not any better than competitive guns, has a wonderful balance but in your hands you cannot detect that the heft and feel is anything out of the ordinary. But when you turn that trim muzzle onto the winging saucer it really stutters! It simply breaks more targets than any other smoothbore!

There is a 20 gauge Model 1100 as a companion piece to the twelve. What the users have lacked are the 28 gauge and the .410 to complete the battery. This year Remington made up for this shortage. The small gauge and the sub-small are now in the line-up.

Both the pipsqueak models are scaled down versions of the original which is the 12 gauge. The receivers have been designed for the smaller cartridges but stocks and forends are of standard dimensions. Both guns weigh in the 7-pound class and both have adjustable weights attached to the end of the magazine tube so that there is a 3/4-lb. variation possible. The guns are gas operated, just like all 1100s, are equipped with 25-inch barrels, topped off with raised vent ribs, 9/32" in width with two sights; the forward an ivory 1/8", and the middle of German silver 1/16". Boring is skeet, with the .410 chambered for only the 2 1/2-inch shell, the 28 gauge for the conventional 2 3/4-inch.

During 1969 the two little autos were sold as matched pairs, both carrying identical match-pair serial numbers. The two came in a handsome hardshell case. For 1970 they

can be bought separately as can the field models in the same gauges.

Tested pretty extensively at skeet, I was elated at how well both shot. I am a confirmed user of the 12 gauge 1100 at the clay target game so the switch to the peewee models was an easy one. While both guns are lighter than the 12, the feel and pointing qualities are identical. The first 100 targets with the 28 gauge resulted in scores of 25, 23, 24, 24 for a total of 96. This is a season's average for me with the 12, the fact that the little 28 with its 3/4-oz. load would do just as well was a pleasant surprise. The second hundred birds ran 22, 24, 24, 24, for a total of 94. I then switched over to the .410. I had never shot the tiny 1/2-oz. load at a skeet target. I'd simply never had the courage. I am a pretty ordinary skeet shooter with the 12, my standby, and to have the temerity to pop-off a round with this lilliput took a lot of courage. I've now shot the gun on 50 targets, scores have been 24 and 23. This is a good beginning—far better than I had anticipated.

The latest Model 1100s are splendid additions to the line. Both handle sweetly and are fast and smooth without the lightness which so often ruins the handling qualities of the ultra small bores. There is no tendency of jumpiness or waver when the guns come to shoulder and both track and follow the target with a sureness and dependability that is going to be appreciated by skeetmen everywhere.

Oxford Sight

Mounted on the .44 Marlin Model 336, carbine, this unique sight has been the source of a lot of fun. The Oxford sight consists of a pip of light which replaces the conventional crosshairs in the scope. The tiny spot of light comes from 2 penlight batteries, a power source of 3 volts. The scope has no magnification and because of this the field-of-view is about like looking through any 1" tube. The whole advantage is the bright little

pinprick of light which does service as the sight.

The pip subtends about 2 inches at 100 yards. The manufacturer says it is 4 inches but with the power turned up to full throttle I can only get 2 MOA. In the first light of morning and the deep dusk of the evening this sight is a real advantage. The tube is only 8 inches in length, weighs but a half-pound, and fits any mount that will take a 1" scope. Internal adjustments permit a ready zero, these movements are rated at ½-minute but on the Marlin I got full one-minute changes for both elevation and deflection. Ten shots fired at 50 yards 42 minutes after sundown, when the target was just an indistinct blur, plopped into 2.20 inches. The darker it gets the brighter and more distinct the pip. That is until the target can no longer be picked up. The sight has no illuminating qualities, the only light is the reticle.

Tried in bright sunlight at 11 A.M., the pip is not as fast to find and align as a tapered post of conventional type. Tested against cross-hairs it is a bit faster than the finest crosswires but on a par with medium to heavy crosshairs. Tested in deep cover, cedar brake jungles, it looms up

beautifully against the dark green background.

This sight would have a lot of utility in the jungle. It would be great stuff in a tiger machan where you have to shoot by the use of a big jack-light. It would perform excellently on Kodiak bear where the shots are oftentimes close in the alder thickets. I can see it as a real gem on North Carolina wild boar where the swine is shot in dense cover before the dogs. It would be poor on long shots such as sheep and antelope where the lack of magnification in the glass would be a disadvantage. The tiny little batteries give 16 hours of useable life and replacement is as near as the closest auto parts store. Available from Shoot-O-Rama, 1015 Belvedere, Waukegan, Ill.

Draper Knife

These hunting knives are made of 440c high-carbon high-chrome steel. Due to its composition and high forging range, 1900-2100 degrees Fahrenheit, uneven stresses and microscopic forging cracks sometimes result. As a choice Draper accepts his steel after mill-rolling and then spends hours grinding, filing and buffing the blade

into shape. Because of the high chrome content a Draper blade will not rust nor stain. Mill-rolling imparts a quality to this steel that cannot be duplicated by beating it with a hammer.

Handcrafted by Bruce, Bart and Harvey Draper at Ephraim, Utah, these knives are offered in 27 styles and types. These range through hunting, skinning, butchering, fighting and throwing styles. The Drapers offer to make any custom knife to the owner's design. They will copy another knife, scale them up or down, alter those shown in their catalog and are happy to work with the individual who provides his own specs and drawings.

Because these knives are entirely handmade, each possesses special character and a quality all of its own. There are no jigs or patterns used in the fabrication of a Draper. These knives are not inexpensive, they are costly but like a fine gun the owner will always feel a fine sense of pride in the possession. The craftsmanship evident in these splendid blades, their usefulness and durability endear them to all true lovers of the huntsman's cutlery. Draper Custom Knives, Ephraim, Utah 84627.—Col. Charles Askins



DOYLE WILLIAMS
TWICE WORLD CHAMPION

Our congratulations go to Doyle Williams, Rt. 1, Box 67, Okemah, Okla., who was last year's champion at the Prospectors Club Meet. This year, he EARNED FIRST PLACE AT BOTH THE WORLD CHAMPIONSHIP MEET AND THE INTERNATIONAL PROSPECTORS CLUB MEET. To see Doyle work with his detector is a joy. Previously, Doyle had used other brands of detectors. His choice of instruments this year was one of our NEW BREED OF HUNTER DETECTORS.



Mailing Address: Department GU P.O. Box 28434 Dallas, Texas 75228
We invite you to come see us at our Dallas location: 11231 Alvin St. Phone (214) 328-5313

WHO KNOWS MORE ABOUT BEAT FREQUENCY METAL DETECTORS THAN THE PEOPLE WHO PERFECTED THEM?

TREASURE HUNTERS ATTENTION *the* **GARRETT HUNTER** **HAS BROKEN ALL RECORDS TO BECOME** **THE NEW WORLD CHAMPION**

Our New Hunter won more contests than all other brands combined.

1st Place, Men's Division, World Championship Meet, Holdenville
1st Place, International Prospectors Club Meet, Midland, Texas
2nd Place, Men's Division, World Championship Meet, Holdenville
2nd Place, Ladies Division, World Championship Meet, Holdenville
2nd Place, Junior Division, World Championship Meet, Holdenville

Our congratulations also go to Sam Boyce of Holdenville. Sam earned second place honors in the Men's Division. Sam's choice of instruments this year was also a Hunter Detector.

Truly, our NEW BREED is now the Professionals Choice. Write for our free brochure and treasure hunting guide. We believe you will be glad you did.



RUGER'S MOST

38 SPECIAL

By GENE LOVITZ



Right: Recoil of the Blackhawk was not excessive even with the hot Super Vel.



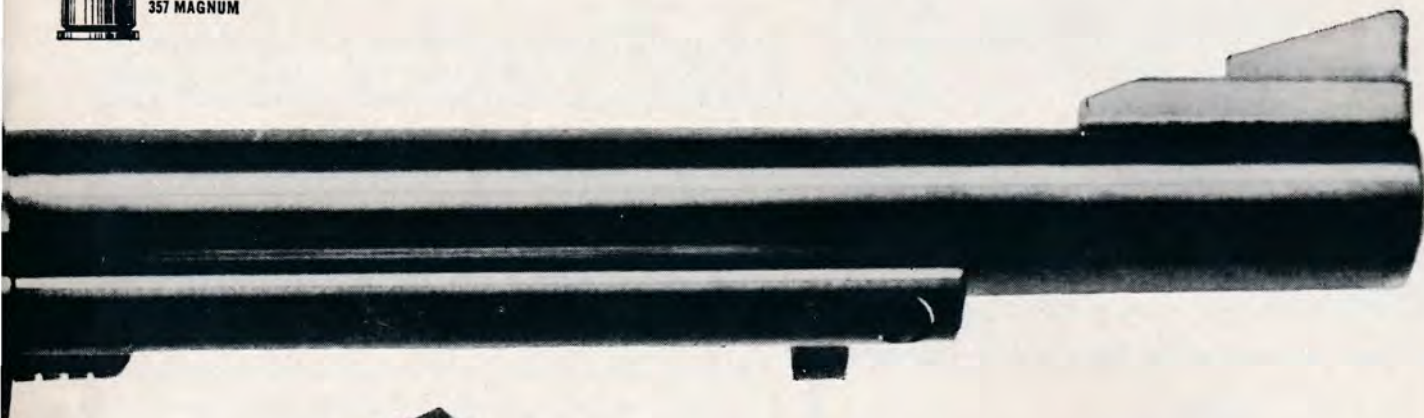


357 MAGNUM

VERSATILE SIXSHOOTER



9 MM LUGER



THE Blackhawk .357/9mm Convertible is not only Bill Ruger's most versatile sixshooter but also one of the world's most versatile handguns. No other handgun can fire a greater amount of ammo. With the extra 9mm cylinder, it chambers three different cartridges. The old Astra 400 semi-auto pistol could be modified to fire five different cartridges, but not dependably. Even though some worked-over Astras chambered more calibers, this Single Action revolver of Ruger's — within its three calibers — fires a greater amount of commercial loads and bullet weights, and it accomplishes this with great reliability and accuracy. (The amount of published handloads this gun will fire is staggering.) With the exception of the old S&W 1917 Army Model .45, this new "Blackhawk" is the only revolver around that can fire ACP rimless rounds without having to resort to moon-clips.

The Blackhawk Convertible is an ideal 'companion piece' for the semi-auto buff as its extra cylinder allows it to chamber the widely used 9mm Parabellum (Luger) cartridge. The fact that this gun handles the most popular American rounds (.357/.38 Specials), along with the king of the European cartridge (9mm Luger), makes

this the first *real* international handgun to be made. As a Ruger ad states: "This is the ideal answer for the shooter in remote areas, because there's virtually no place in the world where ammo for this handgun cannot be obtained." And, bunko, that's saying a mouthfull!

I am the world's greatest admirer of the 9mm cartridge and was on Cloud 9 when Ruger announced their .357/9mm Blackhawk. The 9mm has amazing accuracy when fired from the 4" and 5" barrels of the semi-autos. I figured the ballistic efficiency of its bullet could do nothing less than improve its trajectory when fired from the longer 6½" barrel of the Blackhawk. Here, too, is a gun in which handloads can be pushed the limit.

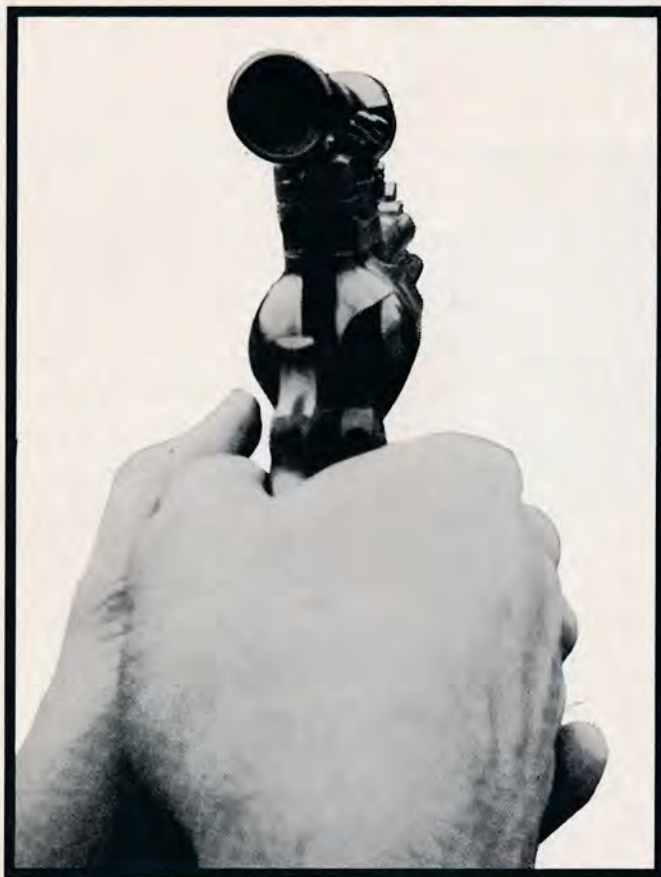
Upon receiving a production gun, I immediately cleaned it, and changed the grips to a pair of hand-carved ivories that Jerry Evens had sent. Then I dropped it into the Model 40 "Virginian" holster I had received from D. J. Cooley of Safariland. I spent the next quarter hour quick drawing in front of a mirror. I said "Yep" a lot. When I wearied of playing Gary Cooper — which is neat trick for a short, fat dude — I moved to the basement and my range. I loaded the .357/.38 Special cylinder with Speer Target-38s.

The Speer plastic bullets went right down the middle at 25', if 1" groups can mean down the middle. These 500 fps slugs are good for basement shooting. They are fun rounds! Of course they are not accurate enough for any real testing. They kept in 1" groups because I was only 25' from my target, using a 6½" barrel. But they are fine for *revolver* plinking at home.

Later, I compared the new .357/9mm Blackhawk Convertible with a 14 year old .357 Blackhawk. The only difference I could find was that the Convertible's grip was set back a bit more than the older model, with a mite more space between the grip and trigger guard. I prefer the grips on the new "Blackhawk."

In the past, I have used the 2X Leupold sight with good results with a Buehler mount, and I am somewhat partial to the Bushnell Phantom II scope because of its universal mount. However, I have decided to use an *optical sight* instead of a magnification scope. I've been

a photographer for 20 years — where my livelihood depended upon the ability to use optical sights — and I am of the school that it is more the crosshair accuracy of critical optics that make handgun scopes accurate than a question of magnification. A few days earlier I had



Above: Two views of the Hutson Handgunner scope/mount with the new Ruger. Nice combination!

received a *Production* model of the Hutson IX "Handgunner Scope" from its designer, John Norman. This production Handgunner was used for my test run on the .357/9mm Convertible Blackhawk.

Bright and early the next day I was out on a farm where I usually conduct my tests. It was a good, sunny day, without a trace of wind. I set up targets at 50 yards and unloaded a wide variety of Super Vel ammo Lee Jurras sent me for test purposes. I was as anxious to test the new Super Vel (especially the new 137 gr. Super Vel in .357 caliber) as I was to test the new Ruger replete with the new Handgunner Scope. The last item I set up was my old, beat up chronograph.

First, without the scope, I fired some army surplus 9mm to get the feel of the gun. I averaged 5 inch groups. I was satisfied that the Ruger would indeed fire the Luger cartridge, and pleased to find that the tapered case of the 9mm aided extraction.

Next I moved up to 25 yards. I wanted to check its accuracy when fired at the longest normal distance for average usage in combat/police work, as well as at the average range for hunting animals (such as wild boar) with a handgun. Firing somewhat rapidly, and still without the aid of the Handgunner Scope, I managed a 1½" group with five slugs printing inside 1" with the 90 gr. Super Vel 9mm soft points. Out of 36 rounds, I averaged 2" groups, disregarding 7 fliers that bled to 4-5 inches.

I moved back again to 50 yards, changing to the .357/.38 cylinder, and fired several dozen volleys of .357 and .38 Special ammo. My Remington .357 soft points printed inside 2½ inches. I always get tight groups with Remington's hottest .357 load. The .38s opened to 3½" groups. Then I pulled the plug on the .357/.38 cylinder. The .357 Blackhawks and the various .357 and .38 Special loads had been tested and documented enough. It was the 9mm round which was the real challenge . . . when fired thru a barrel that most think of as being .002 too large for the Parabellum bullet. The performance of the .355 slug, for the .357's barrel, would be the acid test for the gun!

I removed the adjustable back sight and mounted the Handgunner Scope. The evening before, my gunsmith, Bill Klicka (Central Sales Gun Shop, 2874 N. Milwaukee Ave., Chicago, Ill. 60618), drilled and tapped a standard 6-48 hole to accommodate the Handgunner's base adapter. The conversion thereafter takes under 5 minutes. (Most S&W revolvers require no drilled holes.) With a bench rest I zeroed-in the sight. Windage is easily adjusted with cone screws. I found the Allen screws a bit more difficult in adjusting the elevation. The 5½" long optical sight produced a remarkably bright, clear image, allowing a 4-foot field at 50 yards.

In testing 90 gr. Super Vel hollow-points at 50 yards with the Handgunner Scope, I kept 50% of the three-shot groups inside 2½ inches, and the other 50% printed inside 3 inches, a pretty tight group for me at such a distance with a handgun, even with a scope. For me, 50 yards seems like more than double the 25 yard distance when it comes to shooting. At 50 yards, there certainly was no indication that the .357's bore was sloppy for the 9 mm slug. I clocked these factory loads at 1492 fps.

The 9mm Winchester 115 gr. slugs kept inside of 3½ inches on average. I was some- (Continued on page 69)

YOU CAN HELP REPEAL THE GUN CONTROL ACT OF 1968!

THE FOLLOWING are excerpts from a newspaper column written by Bob Rankin, outdoor writer for the "Cincinnati Enquirer." It appeared in the Sunday edition of that paper on August 24, 1969. The message in this column is one that should be brought to the attention of every legislator.

There is a more subtle message, also. It says that those in the shooting sports must band together in their efforts to prevent further anti-gun legislation, and to eventually change the mood of the lawmakers from one of "Get the gun," to "Get the people who use guns illegally."

Here are some of Bob Rankin's remarks:

WHY SO GRAND?

VANDALIA, Ohio—If all the world conducted its business and its home life as the Grand American Trapshoots are conducted in this Central Ohio city, you could scrap Moses' 10-point plan and do away with all anti-gun legislation at all levels of government.

How can this be? I don't know the why or wherefores, but let us take a look at the facts: Since 1924 when the Grand opened in Vandalia, not one person has been shot, accidentally or otherwise. So what? Well, when you consider that in recent years 1.5 million rounds of shells have been aimed at 1.5 million targets in nine days every year with no mishaps, that is an enviable safety record.

Further, right beside the shooters are gun booths, refreshment stands, and a milling crowd of people. Some of the people are carrying both guns and ammunition. Others are in the promenade enjoying

themselves.

What more? Many children run up and down the main mall or play in the grass under the shade trees. Not one has been shot. Not one has picked up a gun and shot someone else.

Directly behind the mall are about 500 families camping out. While the husband and wife, or intermediate children are out shooting on the aprons nearby, the others are playing, sleeping, cooking, keeping house in tents or trailers. Guns are leaning against the walls of most of the living quarters.

At one end of the grounds are parked about 4,000 automobiles, all containing guns at some time or other. There are 53 traps of five stations each and that makes about 250 shooters going from morning to night for nine days.

There is no need for gun legislation here or statutes against their use. Again why? Well, sir, one very good reason is the cold hard irrefutable fact that these people know guns. They respect the gun and what it can do and should do. Their children grow up with guns, know all about them.

Of course there is one other reason for the good conduct here: Among the shooters is the middle class American you read about. He's the one who obeys the laws, pays his taxes, does his duty by town and country and respects the rights of his fellow man.

He rarely runs afoul of the law, anyhow, whether it deals with guns, or other misdemeanors or felonies.

Who helps operate this (Continued on page 56)

NEWS FLASH—From Washington comes word that a bill has been introduced in the Senate that may remove restrictions placed on sporting firearms being shipped via mail. The bill was received from Senator Gale McGee (Wyo.) and is designated S.3417. It would amend the GCA '68 in order to legalize interstate mailing of the guns between gun dealers and unlicensed individuals. McGee said the bill grew out of the growing number of complaints about the amount of red tape involved in selling firearms to out-of-state residents. Some sportsmen believe McGee is trying to regain some votes after he voted for federal registration and owner-licensing during 1968.



GUNS of COWBOYS

By COL. CHARLES ASKINS

COWBOYS DON'T PACK the old .45 Single Action and the .30-30 lever action carbine anymore. At least the majority of them don't. There are some of the old timers who cling to the traditional ordnance but their numbers are scanty. All you have to do is to make a big swing through the cow country and count the hardware you see and you will find that the times have changed.

The cowboy has always been a gun toter. For a hundred years in the history of the West he has lived with a gun handy by. Usually a six-shooter and invariably a rifle. The fact that the Colt Model 1873 came along when great portions of the West were being opened up to cows and their herders and the further fact that the most famous Winchester also bowed-in during the selfsame year made it another natural choice.

Both firearms endeared themselves to the hard-riding westerner because the pair were sturdy, reliable and ideally designed for the job at hand. The six-shooter rode up the longhorn trail to Abilene and Dodge and came in for its full share of fame and glory in the smoke-wreathed and hell-roaring street known as Texas. A thoroughfare where they served-up a dead man for breakfast every morning and the .45 Frontier Model figured prominently. The rifle was only a .44-40 in those days and not very powerful altho Jim Gillett, a Texas Ranger for six years, and afterward—through a long lifetime—a rancher, said he shot every critter that ran wild in Texas with his '73 to include a bull buffalo. Later on, however, this same bucko layed the .44 aside in favor of the 1886 Winchester. Gillett had the rifle in .45-90 caliber. One day he loaned it to Capt. John Hughes, the commander of Company D of the Rangers, who went on to kill a couple of horse thieves in the Big Bend.

The Winchester has always been a prime favorite of the cowpuncher. Right from the beginning it was more often in his hands and under his saddle fender. It was the long-odds best not so much because of its caliber but more because it lent itself to horse-carry. The flat sides of the receiver, the streamlined lever, the inconspicuous hammer and the short length all combined to make it ideal as a horse gun.

The older cowboy, who swore by the .45 SA Colt and the .44 Winchester was not much of a hunter. He only shot for the pot and counted more on eating his neighbor's beef than on killing wild game. The arms he packed were for smoking up the opposition; personal enemies, horse thieves, border bandits, and like gentry. The game shooting was strictly secondary and intermittent. For these reasons when better rifles came along like the Winchester Model 1876 which was chambered for the .45-75 cartridge, a much improved loading over the peewee .44-40, he was not much interested. The rifle had good lines for scabbard use but it was too big, too long, and far too heavy.

It was equally true about the excellent Model 1886 when it broke into the picture. Chambered for such good cartridges as the .38-55, the .45-70, .45-90 and the .33 WCF, this rifle left a small imprint on the ranchers and their hired hands. Again, as with the Model '76, it was a question of too much gun. It was not until the .30-30 came along that the cowman stacked (Continued on page 62)



One of the fastest open-top holsters made by Sam Myers.



Mexican soldier of the 1930 period with a Mauser rifle.



Mexican rancher holding M-54 Winchester. Note other guns.

A&W

DIVERTER

By JAMES D. MASON

Widely hailed for its use by police, the A&W Diverter is tested with an eye toward its usefulness by the sportsman.



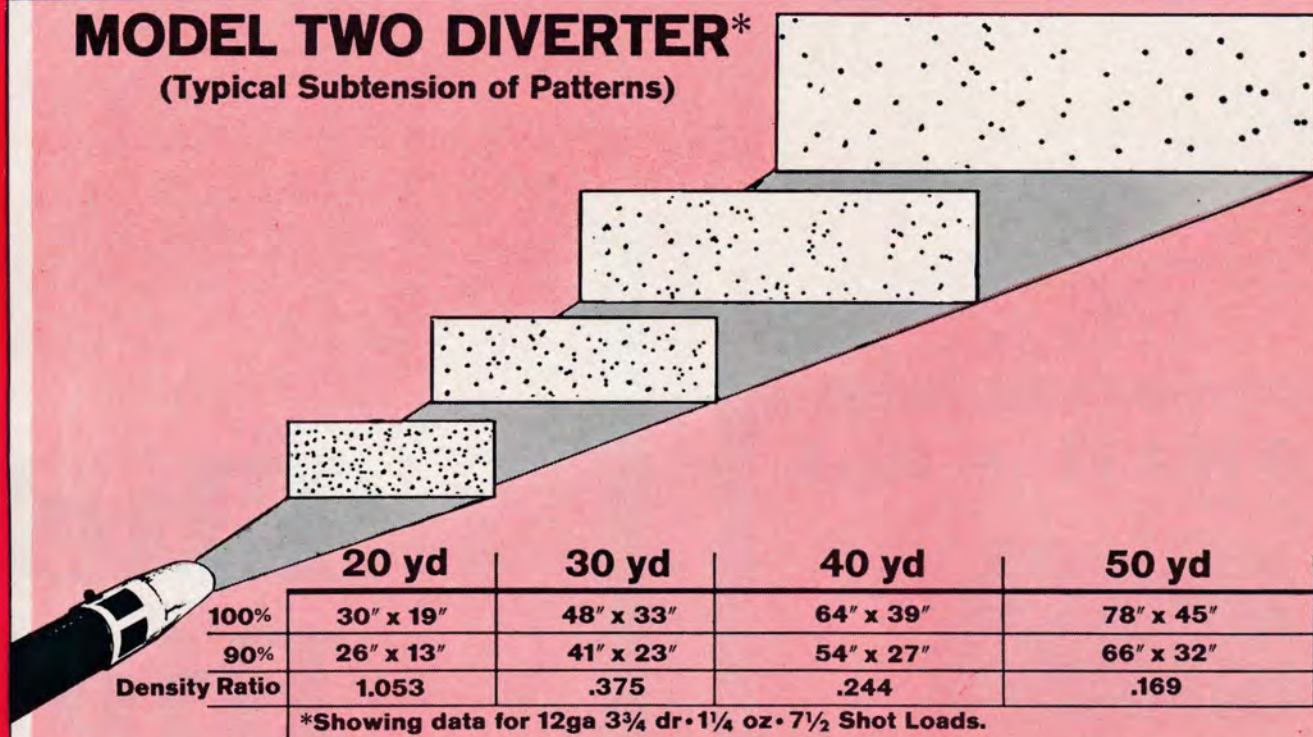
A DEVICE DEVELOPED for use in military combat also serves sportsmen afield. The A & W Diverter, designed to spread buckshot patterns horizontally for police and military uses, provides several unique characteristics that control shotgun patterns for upland gunning and waterfowling.

Not since the perfection of choke boring about a century ago, has there been any basic improvement in the means for controlling shotshell patterns. The traditional characteristic of shotshell pellet distribution is the circular pattern. The density of hits in a 30-inch circle at a given yardage has been standard for judging the relative effectiveness of the choke.

With the introduction of the A & W Diverter, shotgunners have to consider a horizontal dimension to shotgun patterns. The spreading of shot on one axis of the pattern has obvious advantages. It simplifies lead calculations for pass shots and improves hit probability at all effective ranges.

MODEL TWO DIVERTER*

(Typical Subtension of Patterns)



On the right is the Model Four, left is Model Two.



Model Two on a 22" barrel M 1100 Remington.

The Diverter is *not* a choke device. It uses aerodynamic forces to control the distribution of shot. In the process, many disadvantages of conventional, constrictive choke boring are overcome, while new standards of pattern uniformity are possible. Since the Diverter represents such a significant innovation in shotgun development, it merits an appropriate evaluation.

The Diverter is a muzzle-mounted device that is made from an investment casting using 4340 alloy steel. It was originally developed for the Air Force to provide a horizontal to vertical pattern spread ratio of 4-to-1 for use by Air Police in base perimeter defense. In effect, for every foot of vertical spread at a given distance, the horizontal spread of shot will be four feet.

Presently, two configurations of the Diverter are made. There is the original Model Four (4-to-1 ratio) and a Model Two (2-to-1 ratio). Both models have a usefulness to the field shooter, but the latter, Model Two, is designed specifically for sporting applications.

Examination of the Diverter shows a cylindrical transitional chamber ahead of where the device attaches to the barrel. This chamber has three large cut-away sections or ports on the circumference, and three posts left to support the cone section on the front end. These ports serve to dissipate gas pressure.

The forward cone section of the Diverter is oval shaped inside and contains compound curves that contribute to the performance of the device. The oval is laid horizontally; two ribs protrude into the oval, one from the top and one from the bottom. The ribs maintain a constant bore diameter distance between them on the vertical axis of the Diverter opening. These ribs have a dual function: (1) They neutralize the torque of the shot charge and (2) control aerodynamic force vectors that result in horizontal spreading of the shot pattern.

To fully understand how the Diverter controls shot patterns, it is best to discuss the characteristics of a regular choke bored barrel first. Choke (Continued on page 65)

HAWKEN

The Big Saint Louis Gun



Part 1
By E. L. Reedstrom

IN THE early 1820's, St. Louis, the center of the fur trade, was already becoming a fast growing metropolis. Though the residents numbered more than two thousand, there was by far a larger floating population of French-Canadian voyageurs, Spaniards, merchants from the East, emigrant farmers, and Indians. Street corners and saloons echoed to the babel of English, French, Spanish, and a dozen or more Indian tongues. Fur was the subject, usually beaver, whose glossy pelt supplied material for the gentleman's top hat of the day. The establishment of the western headquarters of the American fur business at St. Louis was one of the many indications of the increasing importance of that city as a center for trans-Mississippi commerce. St. Louis, strategically positioned on the Mississippi, was a natural outfitting point for traders and trappers, and a logical place for the marketing of the returning furs.

In addition to this melting pot of managerial force was an army of men, responsible for the heavy manual labor of bringing in the furs. These white trappers were classified in two main varieties—those who were hired out for the year by existing fur companies, and those who had no direct connection with any company and classified as "Free Trappers". The Indians much preferred to call these buckskinners the "Big Knives" because of the huge sharp fighting knives carried in their belts and sashes. In general, they were commonly known as "Mountain Men."

A good trapper was able to handle a line of from six to ten traps which he tended and visited regularly. In a season, approximately three months, a free trapper who knew his business usually earned several thousand dollars in beaver skins. These buckskin-clad mountaineers went about the St. Louis shops to purchase and replace new equipment with serious intent, for there was nowhere on the trail to obtain supplies once they left the last settlement behind. In addition to his traps, bait, and chains, the mountain man carried an arsenal of weapons on his shabby form; a good sized, well filled powder horn, a leather bullet pouch, plenty of flints and patches, and a knife, with a sandstone rock fastened by leather thongs to the sheath. A belt pistol was not at all uncommon, but the pride and trust of many was put in a good Hawken rifle.

This "Rocky Mountain Rifle" reached the pinnacle of esteem in the hearts of



Left: A late period S. Hawken rifle. Brass tacks reflect Indian treatment, but it is believed to be the work of an owner to cover-up a cracked wrist. Below: A Hawken advertisement in the Saint Louis Directory, 1847.

J. & S. HAWKEN,

MANUFACTURERS AND REPAIRERS OF



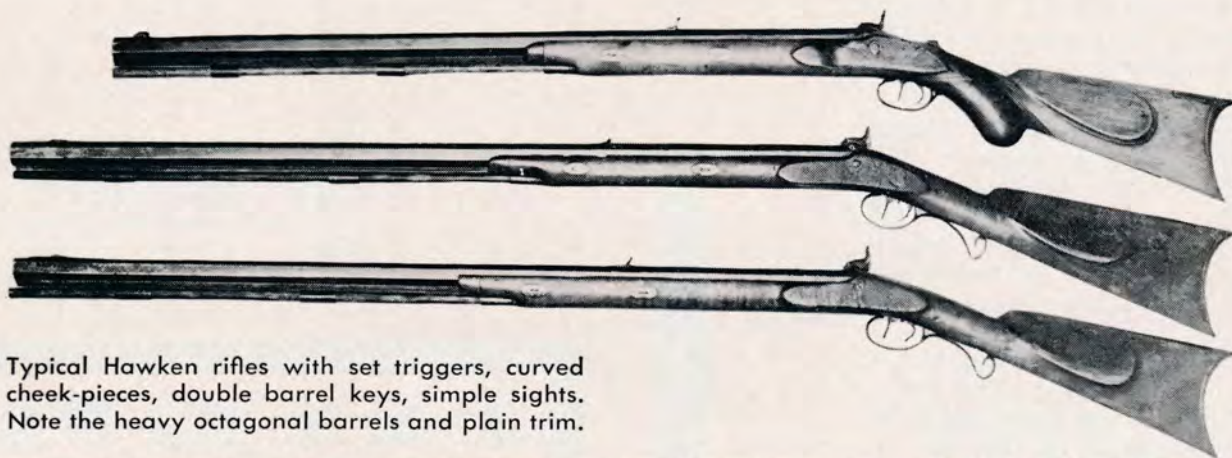
RIFLES AND SHOT GUNS,

No. 33 Washington Avenue, St. Louis, Mo.

mountain men because it combined sturdiness, dependability and simplicity with accuracy and great power—and above all, its freedom from need of repair. The Hawken rifle was created to meet the need for a firearm powerful enough to drop a charging grizzly and to penetrate the thick hide of the buffalo at either close or long range. These two great animals of the plains had not learned respect for man and his weapons, and were as apt to charge on sight as to run away.

The "Kentucky" rifle was too light and fragile, and not powerful enough for a plainsman's task. The Harpers Ferry—first made in 1800 and improved in 1814 and 1817—was too clumsy for a saddle gun. The heavy English sporting rifles made by London gunsmiths were too scarce and expensive. But the name "Hawken" came to be a guarantee of quality, and the details of the rifle fine examples for all other gunsmiths to follow in supplying the Western trade.

Jake Hawken, the elder and more celebrated of the two brothers, was born in Hagerstown, Maryland, in 1786, of Pennsylvania Dutch ancestry. His brother, Samuel, was born in Hagerstown, October 26, 1792. Jacob and Samuel Hawken learned their trade well in their father's shop in Hagerstown. Christian Hawken was a fine



Typical Hawken rifles with set triggers, curved cheek-pieces, double barrel keys, simple sights. Note the heavy octagonal barrels and plain trim.

gunsmith, and he taught his sons well. Jacob, the elder of the two, worked with his father turning out the typical flint-lock, full-stocked Pennsylvania rifles marked "C. Hawken" in script on the top barrel flat. Jake was a crack gunsmith and a keen business man and whatever provoked him to settle in St. Louis, has never been established. The challenge of the frontier—adventure—or the feverish ambitions and ideals of his own gun shop along with a rapid building Western trade may have enticed him.

In 1807, at the age of 21, Jake arrived in St. Louis seeking a job. The French settlement there was already be-

ginning to lose its character; unlighted and badly paved streets became dangerous and hazardous for anyone traveling on foot or by coach. Curious old houses of wood, well constructed, standing in their gardens, showed European taste. There was an open market place, where almost anything could be purchased, and an old Catholic church standing nearby. The City Hotel was located almost in the country, and kept neat by a worthy Kentuckian, who did not favor Mountain man's bad habits.

Jake found work, and with a fortunate combination of good mechanics and a keen business head, by 1815 he was able to open his own shop on 214

North Main Street. By establishing his gun shop in St. Louis, Jake laid the foundation for a business that enjoyed a reputation for excellence for as long as the muzzle-loading rifle retained its importance on the frontier.

The Missouri Fur Company had already made considerable footholds along the Missouri, and each year, wanderers from Tennessee, Kentucky and other border states turned their attention toward the rich beaver harvests awaiting in the mountains. When they returned from the mountains to St. Louis for supplies and old pleasures, Jake Hawken's shop lay directly in their path. (Continued on page 50)



Left: Mariano Modena, a Mountain Man who was hard to beat with a Hawken. Above: Modena's rifle fitted with a patch box made of iron to reflect less light than brass. It was bought in St. Louis in 1833.

The RIGHT And The JOY

One man's thoughts on
Guns, Hunting, and The Right To Bear Arms



Part 1

By NAMEER JAWDAT

AT A TIME when the shooter is beset on all sides by those who would take his most cherished possessions and rights away from him; when—all over the world—the sportsman and the hunter are attacked and vilified in print and from the public platform; it is necessary for those who value the *idea* of guns, of shooting, of hunting, to stand up and be counted. Here, for the record and for what they are worth, are one man's thoughts:

Let us begin with hunters. Now there has certainly been a lot of nonsense said against hunting, and while I do not expect that it will ever stop, we might as well begin by affirming that there is a valid reason why men hunt. Miss Rebecca West, speaking of a good shot, has said "that is certainly a fine thing for a man to be, proof that he is a good animal, quick in eye and hardy under weather." But it is a fine thing for more than that. For we tend to forget that man is but a step in time away from the jungle, and that the aggressions he inherits are not buried but hidden, and not very

well hidden at that. One of the most beneficial and socially acceptable ways to vent this aggression is in sports, by which I mean active sport, not watching instant replays on the idiot box over a TV dinner. And of all sports hunting is the most beneficial for a variety of reasons. A good game of tennis is an elegant way of getting rid of one's excess energy and acquiring the pleasing weariness that leads to a good night's sleep. But a game of tennis, or football, or golf, is a competition between players, using artificial rules and artificial scoring points. The hunt, rightly followed, is a challenge between Nature and solitary man, and the rules for it were set a long, long time ago. Nor does the fact that he carries a gun have any bearing on the matter. Man's domination over the beasts began when he started to use his brains; his biceps were never a significant factor in his survival. At the risk of sounding pompous, therefore, it must be affirmed that hunting, even apart from its necessity in maintaining the ecological balance, has a serious role to play in the develop-

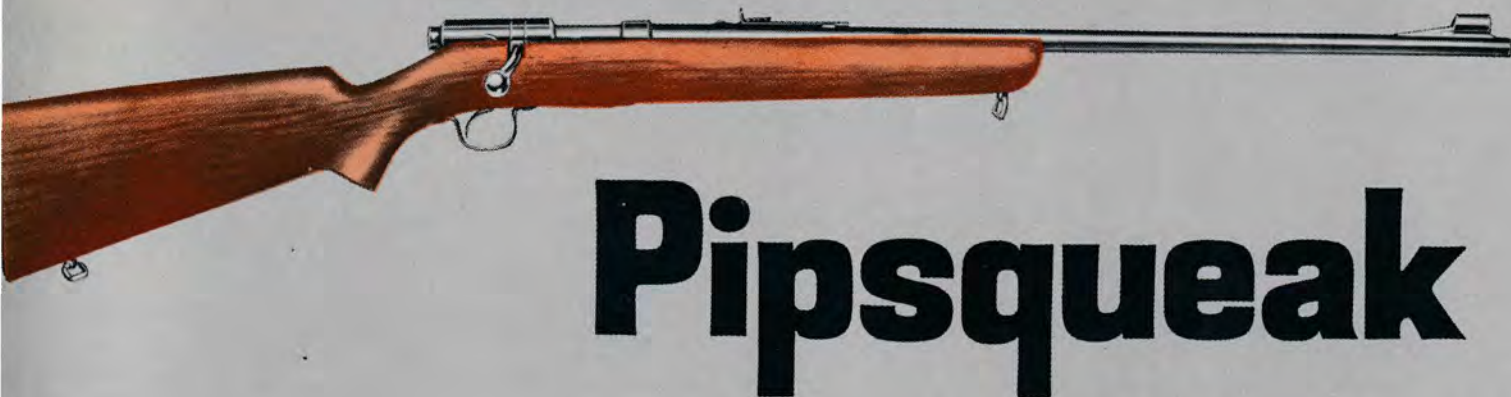
ment of civilized life. Of course, the corollary to that is that it must be followed in a civilized manner, and it is here that something very important needs to be said.

The sportsman must put his own house in order, for it is here that the danger lies. We are all under the magnifying glass, and any shooter who brings shooting into disrepute is putting sharp tools into the hands of the enemy. At a time when the most noble of pursuits is threatened by all the kooks, do-it-yourself psychiatrists, blue-skies nitwits and let's-pass-a-law simplicists, we should not even consider being tolerant with louts who endanger not only their own lives but the lives of others and the very survival of shooting.

A few years ago, in Maine, that most beautiful of states, you could occasionally see in the backwoods an unhappily ruminating cow with the letters C-O-W whitewashed on its side. The reason was obvious—some damn fool had shot a cow in the vicinity, and the farmer was not taking

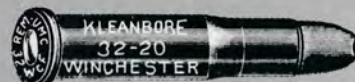
(Continued on page 57)

The Puny



Pipsqueak

By B. R. Hughes



Certainly the screeching sounds being produced by the "Call of the Wild" electronic game caller were not the type of noise that would appeal to me, but the recorded sounds of a dying rabbit were working wonders on the bobcat still some distance away!

My companion, Alex Short, and I had been calling for no more than 10 minutes when the cat appeared, some 100 yards away and sneaking towards us. We were well-hidden and wearing camouflage clothing, and the cat had not seen us. When the frisky feline was some 60 yards away, I raised the rifle, took careful aim, and touched off a shot. At the report the cat crumpled in its tracks.

The rifle was a now-obsolete Winchester 43 chambered for the .32-20. "A .32-20!", you're probably saying. Yep, a .32-20.

If the number of rifles chambered for the admittedly underpowered .32-20 were ever revealed, I suspect a lot of dyed-in-the-wood high velocity fans would probably swoon in dismay. However, the truth is that the little .32 WCF is one of the most popular hulls ever offered to the American shooting public.

Among the more popular rifles chambered for this little number were such stalwarts as the famous 1873 and 1892 Winchesters, not to mention to Savage 23, and a host of others. All told, it appears very likely that well over one million rifles were chambered for the .32-20 at one time or another.

Back in those halcyon days prior to WWI the .32 WCF was regarded as a pretty fair varmint rifle and (whisper it softly) not a bad deer number. In the high velocity loading, brought out for the model 92 and not intended for handguns or the model 73, the .32-20 sent an 80 grain

bullet ambling along at 2100 fps, which sounds rather leisurely today. However, considering that in the 1890's one of the most popular deer cartridges was the .44-40, which had a muzzle velocity of only 1310, the 2100 fps of the petite .32 does not seem so mild. The high velocity .32 WCF loading had a mid-range trajectory of only about 1.5 inches at 100 yards, while other black powder cartridges of that era usually had to lift their slugs at least three inches to make connection at 100 yards.

More than a few squirrels were done in by the standard velocity load, which consisted of a 100 grain lead bullet at 1290 fps. The trajectory was similar to that of a standard velocity .22 long rifle slug.

On the surface it would seem that the birth of smokeless powder would have doomed the .32-20 and its kissin' cousin, the .25-20 repeater. But dealers tell me that .32-20 hulls sell pretty well even today, and Winchester made their previously-mentioned Model 43 chambered for the .32 WCF as late as 1950.

I gather that Winchester brought out the 43 in 1949 primarily because of the tremendous popularity of their model 92 lever action. The 92 was available in .25-20 and .32-20 as well as the .38-40 and .44-40. Winchester sold over two million 92's before it was dropped back in the 1930's. Therefore, the Big Red W boys can be forgiven if they hoped that the 43 would repeat the success of the 92. However, whatever the '92 had, the 43 didn't, and this model never sold well. In fact, although it was dropped from production only in 1957, it is already something of a collector's item. Although official figures are unavailable, I have been told that less than 20,000 model 43's were made.

However, the failure of the 43 should not be construed

as a slap at the .32-20. Any cartridge that continues to sell more than 75 years after its birth must have something on the ball. The question that bothered me, and is no doubt bothering you, was, "What?"

In an effort to answer this question I began to prowling the gun shops of my area, and finally I came up with an excellent Model 43 chambered for the .32-20. At this stage, a word about the model 43 itself might be in order. If you've never seen one, imagine a .22 bolt action clip repeater enlarged perhaps 50 percent in size. Got it? Great, because now you have a very good picture of the 43.

Since the 43 was not drilled and tapped for a scope, or at least, the one I had wasn't, I decided to use the standard iron sights. I invested in two boxes of factory ammo, one of standard velocity and the other of the high(er) velocity variety.



The latter reminded me of the .30 Carbine in regard to noise and recoil, and the results were also startlingly similar. I got groups running right around 4" at 100 yards, which is just about what I get with a good M1 Carbine. The report was more of a "crack" than a "boom," and the kick wouldn't bruise the shoulder of the fairest damsel in all Christendom. Groups obtained with both types of ammo were about the same, and I was left with the feeling that the .32-20 is not the last word in accuracy. I have been told by those who should know that the 43, chambered for the .22 Hornet, is a rather accurate rifle. However, I'll tell the world that in .32 WCF it is not a world beater!

Turning to handloads, I tried 12 grains of 4227 behind a Sierra 100 grain plinker. Velocity was around 2000 fps, but accuracy was no better than the factory

fodder. The fact that the barrel of the .32-20 runs .311 has done absolutely nothing to endear this caliber with handloaders. I probably could have bettered the performance with cast bullets, but by this time I had decided to hell with it as far as fine accuracy was concerned.

Next, I took the 43 hunting, and the results are recorded in the opening paragraphs of this narrative. Sure, it killed that bobcat, but the one shot a few minutes later from another spot was killed just as dead with the venerable old .22 long rifle hollow point.

So, I'm no nearer the answer than I was at the start. I will say, though, that the ballistics of the 80 grain high velocity .32-20 are amazingly similar to the .30 Carbine, and goodness knows this one is popular these days. In fact, Bill Ruger has gone so far as to chamber his fine Blackhawk for the .30 Carbine. How would the 80 grain .32-20 slug perform in a handgun? About the same as

the .30 Carbine, I'd guess.

There is a gentleman who lives near me who very much wants my Model 43. He wants it for his wife, who plans to take it deer hunting. Not big enough for deer? I was just getting ready to tell him this when he informed me that he owned a Model 92 chambered for the .32 WCF with which he had killed nine deer with 12 shots. That ain't bad. I dropped the subject. Let's just say that in all but expert hands it is pretty small for deer and in any hands it is light for deer at ranges exceeding 50 yards.

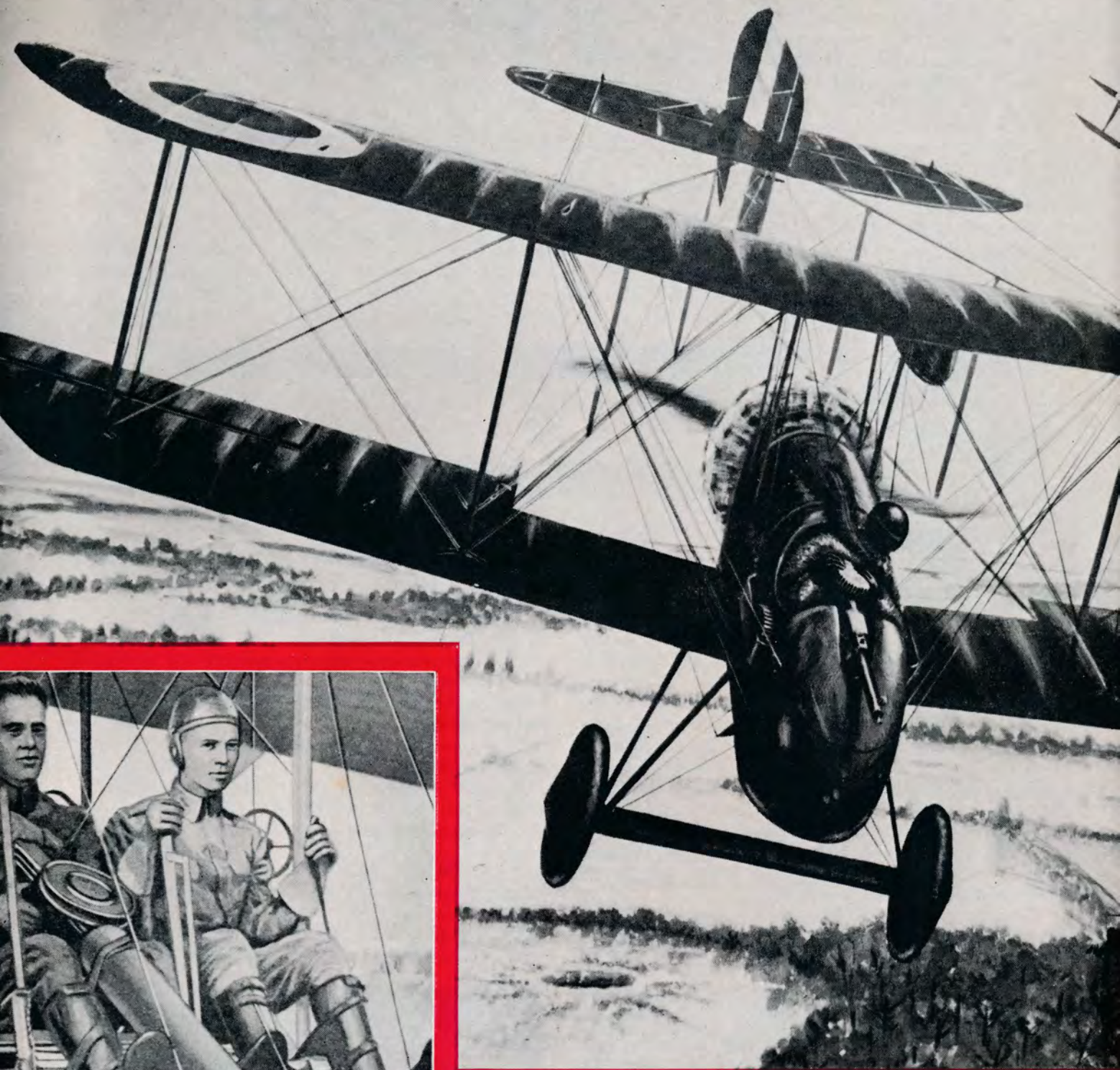
We still haven't answered the question? Why is the .32-20 so popular, even today? Tell you what, I'll answer it with another question. You tell me why the .30 Carbine is so popular today, and I'll tell you why the .32-20 was so popular 50 years ago. OK?



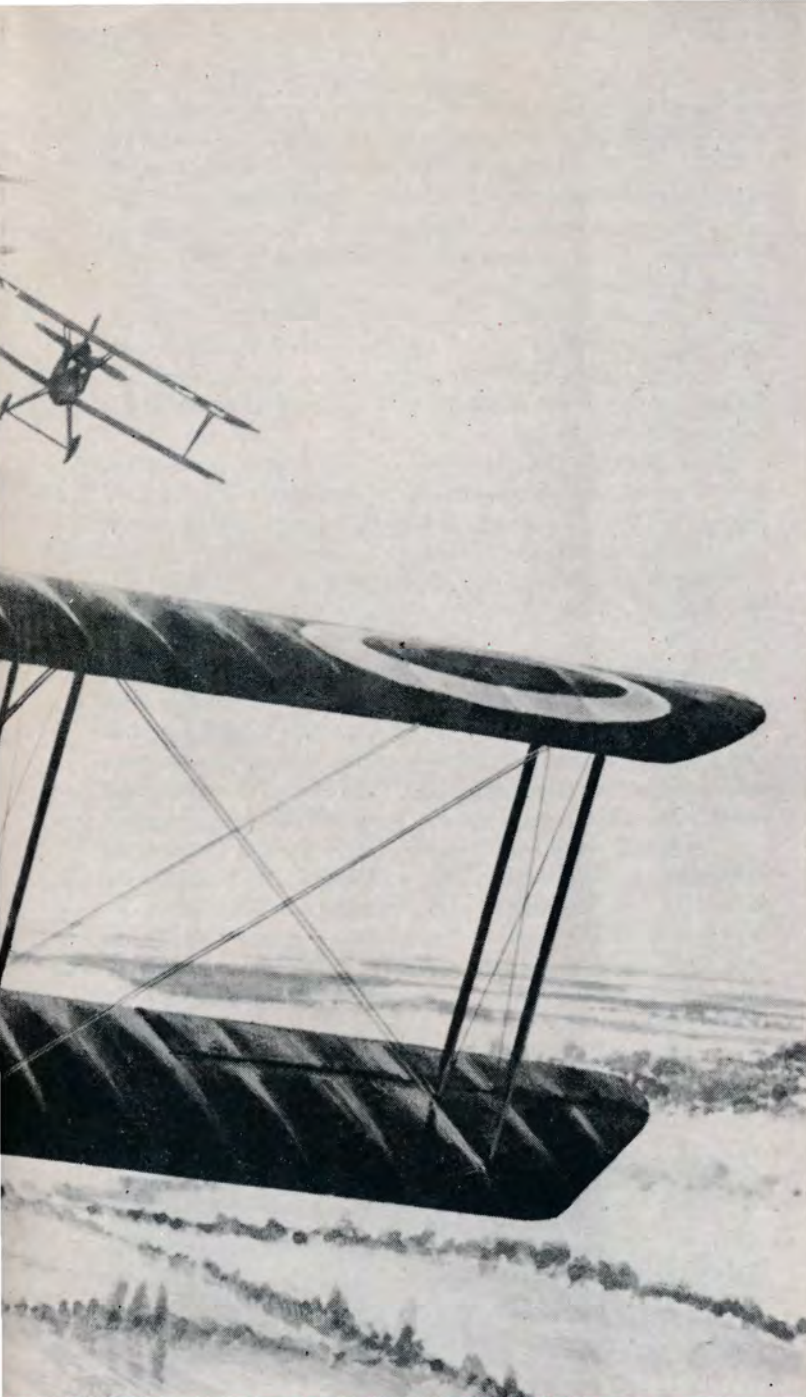
Two dead bobcats—one shot with the .32-20, the other with a .22 Long Rifle HP, but both were clean kills.



The recoil of the .32-20 is not enough to bother even a child. Author's son is shown shooting the Model 43.



Above: Maj. Lanoe Hawker's DeHavilland pusher. Left: Captain Charles DeForest Chandler firing a Lewis gun from a Type B Wright pusher, June 7, 1912 at College Park, Md. Right: Rolland Garros prepares to fire through the spinning blades of the propeller with a Benét-Mercié M1909.



GUNS with WINGS

By MAJ. GEORGE C. NONTE

A COUPLE OF MILES above the Argonne, vari-colored Fokkers and Albatross wheeled and spun in the classic "Kurvenkampf" that had developed in the days when headlines in both camps were devoted to the personal box scores of each Nation's helmeted and goggled heroes—the Knights of the Air. Pirouetting among the splashes of color from the East were to be found drab, sandy-green splotches that were the S.E.5's and Sopwith Camels determined in this Spring of 1918 to even the score for the bloody months of the year before when their predecessors had fallen by the hundreds from the air like so many smoking oak leaves. It hardly seemed serious until smokey, sparkling tracers linked combatants and one cart-wheeled across the sky, shedding fragments and, perhaps, plumes of flame and nitrate-fed smoke.

It was a time when the single-seat fighting aircraft—then called "Chasse," "Chasseur," "Scout," or, simply, "Pursuit"—had reached the epitome of four years' development. In that short period, an earthbound animal had learned



to make his own wings and mold them and himself into a unique and deadly weapon. No more was he bound to fight only in the finite field defined by the single plane of the Earth on which he'd been born. He could now move with speed and precision to any point of the compass and at any angle to the shattered Earth below.

They had finely-wrought aircraft developing previously unheard of speeds; the ability to almost turn in their own length; engines the most reliable ever—but most of all they had guns. Guns painfully developed to fire straight ahead so the entire craft could be aimed like pointing the pilot's finger. Guns that would fire at the rate of 800 or more shots per minute, yet timed and regulated ("synchronized" or "interrupted") so that their bullets would not smash the spinning propellor. Guns that, most of all, would fire reliably from any attitude; when moving parts were gripped by the little-understood "G-force" that slowed them like glue; and also when, at 20,000 feet altitude, inhumanly cold temperatures froze lubricants, reduced ammunition performance, and caused fine steel to snap under impact like a fresh pretzel.

Without those guns, they couldn't have fought, except after the manner of the first airmen, with bricks, grenades, and pistols.

But, those guns didn't come easy nor did the aircraft, for that matter. But, they are another story alone. In 1910, U.S. 2nd. Lt. Jacob E. Fickel climbed aboard a pusher biplane piloted by its builder, the famed Glenn Curtiss. Fickel was a marksman of known ability and carried his M-1903 Springfield rifle. In subsequent low-level passes over a ground target, he scored two hits out of four shots—the first reported use of firearms from aircraft. On the 7th of June, 1912, a similar incident occurred when Capt. Chandler, aboard a Wright Model B pusher piloted by Lt. Kirkland, fired a Lewis machine gun from the air. From an altitude of 250 feet, Chandler hit a 6x7-foot target on the ground 5 times (total shots not reported). A day later, 11 shots out of 44 fired hit a 2x18-yard target under the same conditions, and it appeared that the military value of the aircraft/machine gun combination had been proven that day at College Park, Maryland.

In 1914, both the Allies and Central Powers used the crude aircraft of the time to observe, scout, and photograph one another's ground activities. In spite of official disinterest in arming their frail birds, opposed pilots couldn't resist the temptation to damage one another in whatever way their imaginations lead them. Some dropped bricks and/or grenades from above, others fired with their service pistols, shotguns, or whatever weapons their feeble craft would carry aloft. In early two-seater aircraft, observers often carried a rifle. And, in fact, the German forces adopted the Mexican 7mm Mondragon semi-automatic rifle as manufactured in Switzerland for this use.

As early as September of 1914, some British pusher aircraft arrived in France fitted with a single U.S. designed Lewis .303 MG mounted on a swivel in front of the pilot. All things considered, especially weight and method of feed, the Lewis was the only machine gun in existence at that time that was even remotely suitable for aircraft use. Its unique drum feed offered minimum bulk, facilitating manipulation in the slipstream. Eventually the Lewis was modified and reduced in weight and proved so suitable and reliable for aircraft use that it virtually became the standard Allied flexible gun throughout the War—and for many years thereafter. Any enemy craft attempting attack within

the field of fire of twin Lewis guns was in serious trouble if the gunner knew anything at all about his business.

While the Lewis became a superb flexible gun, its rear-seared design thwarted any attempts at adapting it to fire between spinning propellor blades. It was, however, utilized to some extent as a fixed gun on both British and French pursuit aircraft by mounting so that the line of fire cleared the propellor arc and in the nose of pusher craft. British Ace Maj. Lanoe Hawker ran up quite a respectable string of victories with Lewis guns mounted in the nose of his DeHaviland pusher. The Central Powers never produced a gun equal to the Lewis.

Early French attempts at fixed forward guns involved a light 8mm Hotchkiss installed on a post between pilot and engine, with a gunner standing upright to do the shooting over the top of the propellor arc. Breezy, no?

In early 1915, French pilot Roland Garros decided that he could deal with the 2% of fired bullets predicted to strike the propellor by attaching deflection plates. He bolted a light Hotchkiss to the cowling ahead of him where he could service it in flight. Triangular plates were bolted to the prop to deflect any bullets that might collide with the blades. Garros did great execution (by contemporary standards) among enemy aviators before his "secret" was discovered when he was forced down behind enemy lines.

In a matter of 48 hours after being shown the Garros system and being asked to copy or improve it, Netherlands Aero Engineer Anthony Fokker (he designed the aircraft, too) produced the first successful "interrupter" (not "synchronizer" as it has been called) which permitted a gun to fire more or less freely at its own rate through the propellor arc without striking the blades. It did this by means of mechanically actuated cams which released pressure on the sear to prevent firing whenever the blades were in the



Top: WWII Browning M-2 flexible .30 cal. machine gun.

Bottom: Twin British Vickers .303 on French Spad VII.



line of fire.

Though Fokker is usually given full credit for this development, he actually borrowed Schneider's 1913 Swiss patent which had previously been rejected by the Germans because they could foresee no need for arming aircraft! Evidently, they had poor memories.

Fokker's interrupter gave Germany six months of near-absolute air superiority beginning with December, 1915, when Fokker E-series aircraft began arriving at the front equipped with it and the Heinemann-designed Parabellum and converted Maxim 7.9mm machine guns already in use. The result was the "Fokker Scourge" which virtually swept British and French aircraft from the skies during 1916.

The Parabellum was a new, more compact design based on the Maxim used in German ground guns and in the British Vickers. Being front-seared, it performed beautifully with Fokker's interrupter, but it became the primary German flexible gun of the war in spite of the bulk of its large drum-type belt feed.

The allies worked desperately to develop similar gear and had several mechanical types (both interrupters and synchronizers) in service by mid-1916. However, none were as satisfactory as the Constantinesco hydraulic gear that became standard and went into combat in early 1917. This delay could have been avoided had any perceptive individual remembered descriptions and drawings of Schneider's original development which had been published in several places, including the April, 1914, "Scientific American!"

When the Allies had suitable gear, modified Vickers .303 MG's were fitted to fire through the propellers of all subsequent aircraft. The British Vickers became the Allied standard, no other design in existence being as well adapted or as highly developed (Continued on page 52)



1. Benet-Mercie Model 1909 as used by Allied air arm, WWI.
2. British Vickers with spade grips. Basically Maxim design.
3. Spandau 08/15 used by the Germans and Central Powers.
4. The Lewis gun designed by Col. Isaac Lewis, U.S. Army.
5. Marlin M-1918 cal. .30-06, a superb wartime development.

Left: A German gunner using an oxygen respirator for use in high altitude flying. Gun is the M1913 Parabellum, developed from the Maxim design.



The Lyman Shotshell Handbook

By MASON WILLIAMS



THE LYMAN Shotshell Handbook is probably one of the most important books that has ever appeared in the shotshell reloading field. I consider this book to be so important that it should be required reading for anyone who reloads shotshells.

This Handbook covers 10 gauge, 12 gauge, 16 gauge, 20 gauge, 28 gauge and 410 bore shells in all lengths and in all major types of shells. In 12 gauge alone, it gives specific data on thirteen different basic types of shells.

This book will come as a shock to a lot of shotshell reloaders who have taken a lenient view of scattergun loading. As the Handbook states, "The shotshell reloader should realize that his job is one of assembling ammunition and NOT experimenting with loads". Never deviate from the data given in the Handbook and the Lyman staff tells you why with facts and figures. They show how, for example by switching primers, a relatively low pressure load can instantly become a dangerous load.

"The Dram Equivalent is indicative of an approximate velocity". This old Bugaboo is gone into in depth to show how the reloader can put Dram Equivalent to work for him so that he can assemble shells that will give him better results. In addition, Lyman has fired hundreds of factory shells to furnish a table, in all gauges, that shows the relationship of velocity to Dram Equivalent including all the various shot charges. By doing this, the Lyman staff has given the reloader a factual comparison table with the help of which the reloader can work intelligently.

This book drives home the importance of knowing your

shotshell because its characteristics guide the purchase of the reloading components. To emphasize this even more, Lyman has included a full color, sectioned picture of each case used in their tests thus allowing the reloader to see what was in the shell and then cut his case in half and compare it visually and factually for positive identification. Only then, should the reloader use the data listed in this Handbook.

The Lyman staff has analyzed Pattern and Choke and then tied the findings in directly with another section that I consider extremely informative - the one on Pellet Velocity and Energy. These tables are based on shot size and velocity and on the opposite page is an additional table giving Time of Flight and Trajectory figures. These two sets of figures cover 20, 40 and 60 yards and nail down the question of practical range limitations and, if studied carefully, will aid in reducing the number of crippled birds in the game fields and misses in trap and skeet. These tables tie in with all of the other data in the book to help the reloader produce the type of shotshell load that will best serve his needs.

The shotshell loading data section in the rear of the Handbook is based on loads fired and evaluated in the new Lyman Ballistic Laboratory.

This is not a long nor a large book but every word is important and, as the Editor points out, "We recommend that you first read it through from cover to cover." I heartily concur with this advice.

Price of Handbook \$3.00. From your Lyman Dealer or write directly to Lyman Gun Sight Corporation, Middlefield, Connecticut.



MILESTONES

in the
DESIGN
of



AUTOMATIC PISTOLS

By JAMES B. STEWART

IN ATTEMPTING to determine the half dozen milestone designs in the history of the automatic pistol, the first problem is to determine what constitutes importance. Popularity or large production alone do not constitute importance in a developmental sense. An important design must incorporate the first introduction of important, significant, and widely used features, functions, or design concepts. When viewed in the light of this test many popular automatic pistols fall short.

Indeed, the three most widely-known automatic pistols should not be considered milestones in the true sense. The popular Luger did not introduce anything particularly new to firearm design; it was based on a previous construction and was so complicated and expensive to manufacture that no further designs were copied from it. The Colt 45 Model 1911, on the other hand, though widely copied, was itself the result of a long line of development beginning in 1896 with John Browning's first locked-breech pistol design. And thirdly, the well-known Mauser military "broomhandle" pistol was completely nondevelopmental. It introduced no widely used new features and, with the exception of some more or less direct copies made in Spain and the Orient to capitalize on its popularity, no other designs developed from it.

In light of the criteria listed above there follow my candidates for the six milestones of most importance in the development of the automatic pistol. It is interesting to note that while the United States has never been considered a leader in the development of the automatic pistol, four of the six designs were directly or indirectly the product of American engineering.

After the introduction of the double action feature by the Little Tom about 1920 virtually no more important improvements were made in the design of the automatic pistol. Thus all six of the developmental milestones fall within the first half of the automatic pistol's approximately 80 year history. Whether some new breakthrough is just around the corner is anyone's guess. Experiments with caseless ammunition, rocket projectiles, or something yet unknown may one day lead to the seventh milestone.

(See following pages for details and color portfolio)





BORCHARDT MODEL 1863

CHRONOLOGICALLY, the first milestone automatic pistol, and one surely to be included on anyone's list, is the Borchardt Model 1893. Hugo Borchardt, although a German by birth was a naturalized American. He worked many years for such famous manufacturers as the Singer Sewing Machine Company and the Sharps Rifle Company, designing the famous Sharps-Borchardt rifle in 1896. Although Borchardt finally returned to Germany to live out his life he never gave up his American citizenship.

Borchardt's entry into the field of automatic arms was prompted by his fascination with the toggle-locking mechanism introduced in the 1880's by another American, Hiram Maxim, in his machine gun. Based on this principle, Borchardt developed an auto-loading pistol using the same locking mechanism and patented it in 1893. He attempted to interest American companies in his design without success; finally he returned to Germany and convinced the Ludwig Loewe Company of Berlin that his design had merit. The Loewe Company produced about 2000 of these pistols before it was combined with the Deutsche Me-

tallpatronenfabrik to form the giant Deutsche Waffen und Munitionsfabriken in 1896. The new DWM company then produced approximately an additional 2000 guns.

In addition to being the first automatic pistol in commercial production, the Borchardt introduced the box-type magazine in the grip frame and was also the direct ancestor of the famous Luger. The bottlenecked .30 caliber cartridge created for the Borchardt, and known as the 7.63 Borchardt, was modified only slightly by Paul Mauser for his model 1896 military pistol and in that form continues in production to this day as the 7.63 Mauser.

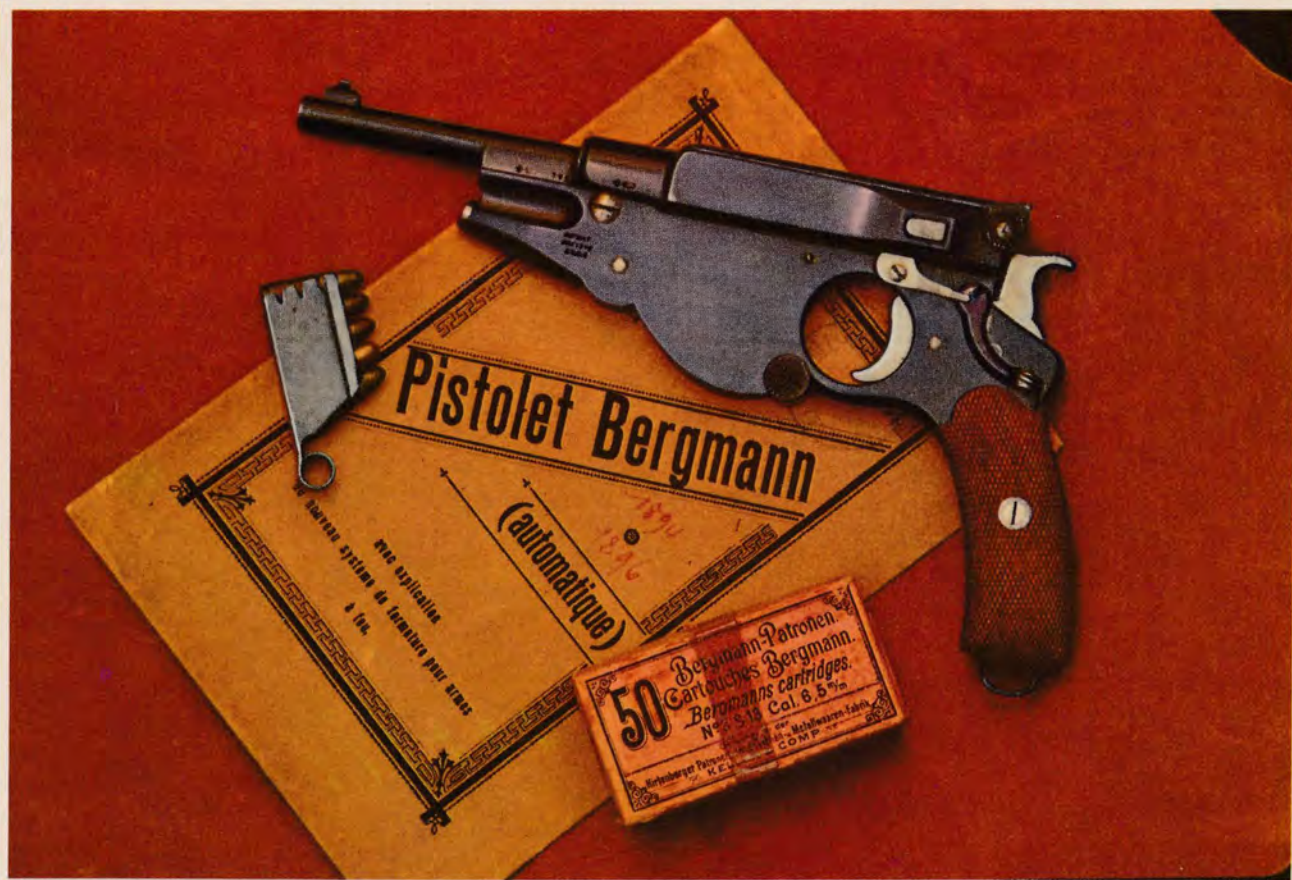
Illustrated is a Model 1893 Borchardt, serial number 1010, manufactured by Ludwig Loewe Company. The pistol is shown with five rounds of ammunition and the accessory dummy magazine, which served as a hold open for the slide and contained in it a three-piece cleaning rod and an oiler. The pistol's awkward shape is explained not only by its mechanism but by the fact that it was originally intended to be used with a detachable shoulder stock as a pistol-carbine.

THE SECOND candidate for this hall of fame is the Bergmann Model 1896. While the Borchardt was the first patented automatic pistol in production it was heavy and cumbersome. The Bergmann, on the other hand, was as simple as the Borchardt was complex and while neither its cartridges nor the unique disposable-clip loading system have survived, the Bergmann rates a position on this list as the first unlocked breech (blowback) pistol to be manufactured commercially and the first attempt at a pocket auto pistol. The "spring-locked" or blowback principle of this arm has been employed in more than 80% of all automatic pistols used since its introduction.

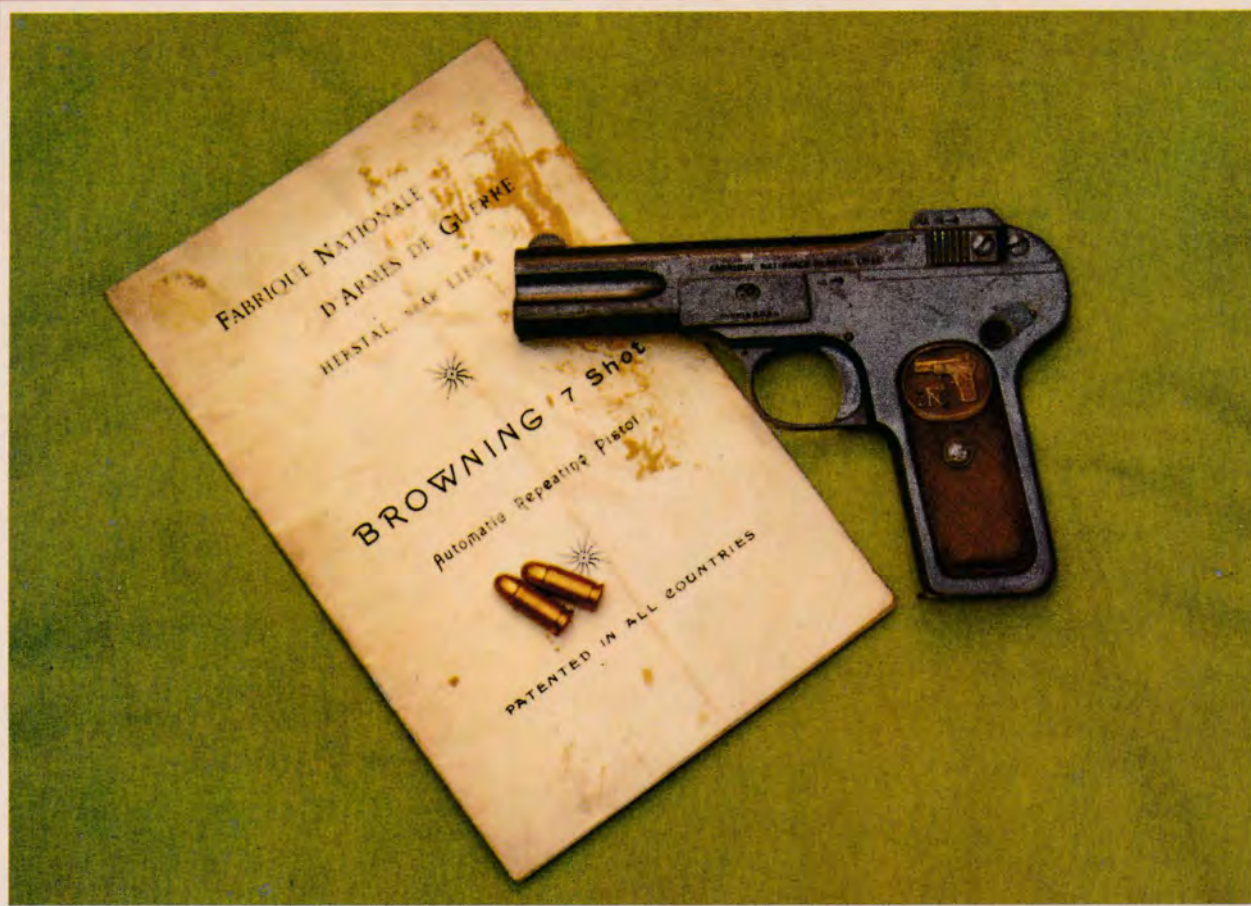
The basic design was created for Bergmann by Louis Schmeisser as modifications of experimental designs produced in 1892 and 1894. Although the production pistols were marketed by the Bergmann firm of Gaggenau in Baden, Germany, they were manufactured under contract by V. Charles Schilling in Suhl, Germany. Bergmann referred to Schilling as their "Waffenfabrik Suhl."

The early production 6.5 mm and 5 mm pistols, which employed rimless, grooveless cartridges, had no extractor, but depended on residual pressure and the strong taper of the cartridge cases to cause the empty shells to be blown out of the chamber. Later pistols have extractors and used grooved cartridges. The early 5 mm design is interesting in that it was made very compact by the use of a folding trigger hinged near its front, thus eliminating the length taken up by the trigger and trigger guard. This feature was dropped when the extractor was added and later 5 mm pistols appear as smaller replicas of the 6.5 mm. The Bergmann was even more commercially successful than the Borchardt, both versions having a total sales in excess of 5000 units before they were discontinued about 1903.

Illustrated is a Model 1896 Bergmann caliber 6.5 mm rimless grooveless, serial number 286, manufactured by V. Charles Schilling. The pistol is shown with an original instruction manual, a box of 50 cartridges, and one of the unusual disposable stripper clips.



BERGMANN MODEL 1896



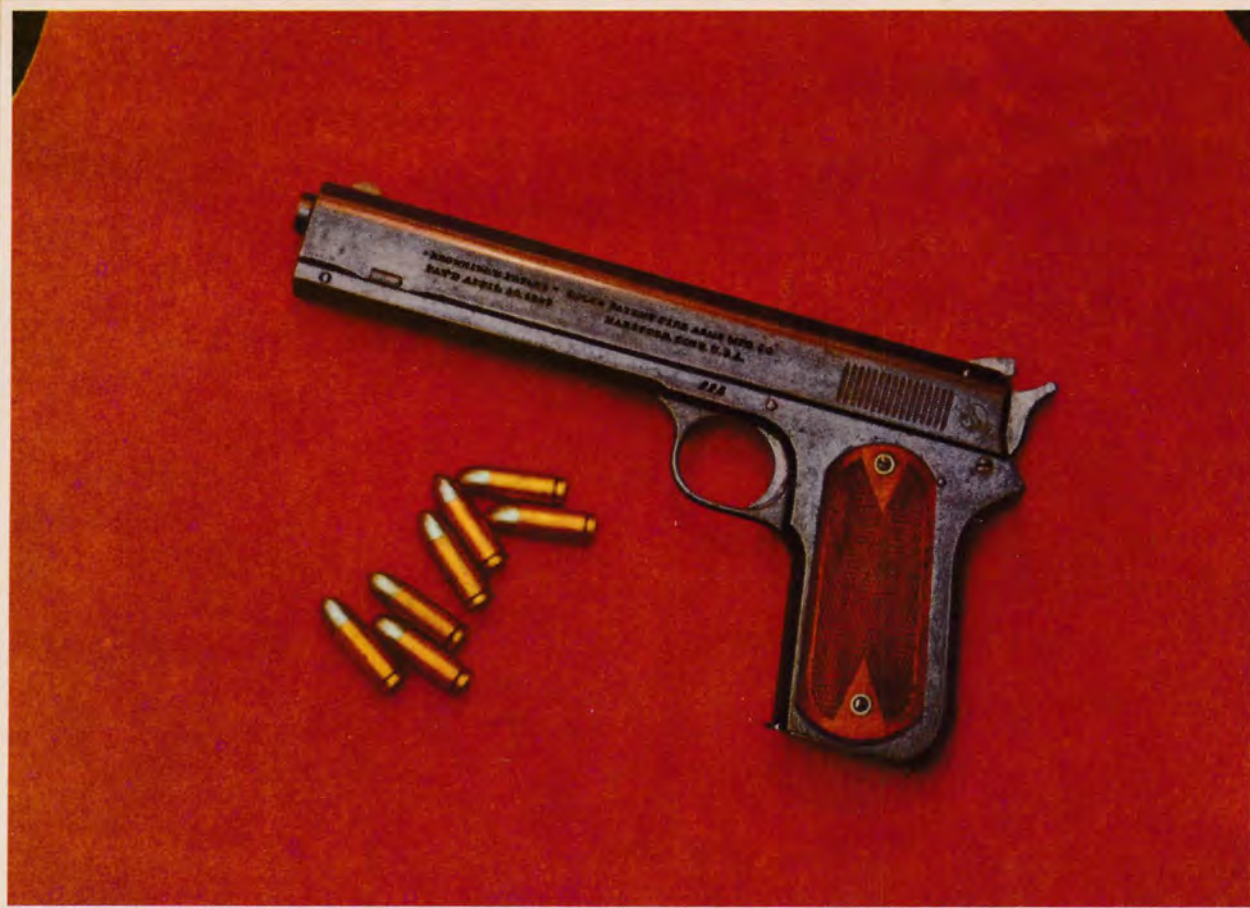
BROWNING MODEL 1900

THE THIRD milestone design ushers in John Moses Browning, assuredly the greatest designer in the history of automatic weaponry. His work on automatic pistols dates from about 1896, but the first automatic pistol of his to be produced was patented in early 1897. By early 1899 the simple blowback pistol was in production at the Fabrique Nationale d'Armes de Guerre factory in Herstal near Liege, Belgium, making it the first of the long line of famous FN Browning automatic pistols.

While from a design standpoint the pistol did not produce many firsts it has several claims to fame. The cartridge which John Browning and FN developed for the pistol became known as the 7.65 Browning or the .32 ACP. So popular did this cartridge become that it has been estimated that more automatic pistols have been chambered for it than all other cartridges combined. Another first introduced by this pistol was Browning's stamped sheet-metal magazine, the basic design of which has been used by virtually every automatic pistol manufactured since its introduction.

The true fame of the Model 1900 rests not with its technical innovations but with two other facts. Although it is not widely known, the Model 1900 Browning was the first military automatic pistol to be adopted into service by any country. The Belgian government, after extensive testing, adopted it as their official sidearm in March 1900, a full year before the Swiss adopted the Luger. The Model 1900 Browning was also the first true commercial success among automatic pistols. More than 100,000 Model 1900 pistols had been produced at FN by August, 1904. Before the Model 1900 went out of production in 1912, almost three-quarters of a million pistols had been produced. This record was not to be surpassed by any other pistol that did not have a large military contract sales for twenty-five years or more.

Illustrated is a 1900 Browning caliber 7.65 mm, serial number 2637. This example of the earliest production variation is shown with two rounds of original ammunition and an original instruction manual. Military contract pistols had plain grips and a fixed lanyard loop. The lanyard loop was continued in later commercial production.



COLT MODEL 1900

UP TO THIS POINT, the majority of automatic pistol designs of importance had been produced in Europe, albeit in many cases with the intervention of Americans. We now come to the milestone which America contributed, and to the second design of John M. Browning. Even before he designed the pistol that was to become the FN Model 1900, John Browning had worked on designs for locked-breech pistols, and in 1896 had taken out a series of four patents, one of which was to develop into the Model 1900 Colt.

This was Browning's first produced locked-breech pistol and the first automatic pistol produced in the United States. It was also the grandfather of the Model 1911 Colt .45 caliber of which more have been made than any other single automatic pistol model in history.

The Model 1900 Colt made two important contributions, in addition to that of the famous Colt-Browning recoil locking system. The first and more important was the invention and first introduction of the slide. This simple and now common feature did

more to improve the balance and simplify design and manufacture than any other in the history of the development of the automatic pistol. The second feature introduced by the 1900 Colt was the graduation of the automatic pistol into large calibers. Previously no automatic pistols had been made in excess of .30 or .32 caliber.

With the introduction of the Model 1900 Colt in .38 ACP, the first true military caliber automatic pistol had arrived. This is still one of the most powerful automatic pistol cartridges available and is equal or superior as a military cartridge to any other produced, with the possible exception of the 45 ACP which was developed directly from it.

Illustrated is a Model 1900 Colt caliber .38 ACP, serial number 824, manufactured by Colt's Patent Firearms Company of Hartford, Connecticut. The pistol is shown with a magazine load of original ammunition. It is an example of the earliest production variation and has the so-called "sight safety." This consists of a pivoted rear sight which can be pushed down into the path of the hammer to prevent the hammer from striking the firing pin.

THERE WAS a need in the early 1900's for a small personal-protection automatic pistol to compete with the somewhat bulky and unreliable "suicide special" revolvers which attempted to fill that position. With the exception of the 5 mm version of the Model 1896 Bergmann and the 5 mm Clement Model 1903, all automatic pistols produced before 1906 were primarily intended as holster arms. In early 1906, based on the designs of John Browning, FN introduced its "Baby" or vestpocket pistol, the first pocketable automatic and the first pistol chambered for a scaled down version of the 7.65 Brown- ing cartridge called the 6.35 Browning, or .25 ACP.

The pistol appears to be a reduced-size FN M1903 "Grand Modelle," a Browning-designed military pistol which was the inspiration for the 1903 Colt pocket automatic. In construction it differs markedly from its ancestors and has only about half as many parts. It is a simple striker-fired blowback design and in its earlier form has only a grip safety.

The Browning "Baby" became such an immediate success that in 1907 Colt obtained permission to produce a modified version in the United States.

The Colt model "M" in .25 ACP, first marketed in 1908, was the result. The Colt modification added a thumb safety and later, in 1916, a magazine safety. Shortly thereafter, FN obtained permission to incorporate the two additional safeties into their design and referred to the redesigned pistol as the "triple surete" or "triple safety" model. So correct was the design of this arm and this cartridge that it is estimated that more Browning-type .25 ACP pistols have been made both by FN and Colt, who together made nearly two million of this model, and by the numerous companies who copied it, than any other single design in the history of automatic pistol manufacture. It has been conservatively estimated that between 5 and 10 million of all variations were made from 1905 through the end of WWII.

Illustrated is a Model 1906 FN Browning in 6.35 mm., serial number 790, manufactured by FN. The pistol is shown with three variations of early 6.35 mm. ammunition and an original FN factory drawing. This particular specimen of the pistol is from the first month's production run, sometime late in 1905.



BROWNING MODEL 1906



WEINER "LITTLE TOM"

THE FINAL milestone was a little-known gun by a virtually unknown arms designer. In 1908, the Czech, Alois Tomischka, patented, in Austria, a mechanism for the combination of single and double action in an automatic pistol. His design allowed an automatic pistol to fire its first shot from an uncocked hammer, thereby solving two of the major problems with the automatic pistol; first, the necessity of keeping the main-spring in tension in order for the weapon to be capable of firing and, second, the need of having a safety catch engaged, which must be released prior to firing. While several attempts had been previously made to design double action into an automatic pistol none had successfully combined both single and double action.

Because of financial difficulties and the political turmoil in Europe, Tomischka was not able to find a manufacturer who would put his arm into production until after the end of WWI. At that time he took his designs to Vienna, to the Wiener Waffenfabrik, and they produced the arm under the trade-name "Little Tom," which is the Anglicization of Tomischka. The Little Tom was therefore the first commercially produced double action automatic pistol. It was patented

nearly 20 years before the more famous Walther, and was in fact in production 10 years before the first Walther PP was made. Not only was it in production but, for the times, it was reasonably commercially successful. The arm was produced in both 25 and 32 calibers and somewhere in excess of 36,000 pistols were made before the company was essentially forced out of business by competition with the much larger Walther firm. In addition to the pistols produced by the Wiener Waffenfabrik, Tomischka took the tools and designs back to Pilsen at the conclusion of production in Austria and made some few hundred more himself before giving up production entirely.

Illustrated is a Little Tom caliber 7.65 mm., serial number 30194, manufactured by Wiener. The pistol is shown with a copy of the German patent of 1909 which refers to the original 1908 Austrian patent. This pistol is dated 1922 and like all Little Toms in .32 caliber has cherrywood grips with brass inlays. Those in .25 caliber are always found with monogrammed hard-rubber grips. Little Tom magazines are inserted and removed from the top, with the slide locked back, and on late pistols are made of brass.



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PULL!

By DICK MILLER

WHAT RELEVANCE does the much-publicized generation gap have for the clay target sports? When I put together several bits of information I have picked up over the last thirty to sixty days, the generation gap, real or imagined, serious or minimal, seems to have a lot of relevance for the future of the clay target sports.

If the dramatic growth of trap and skeet during the soaring sixties is to extend into the seventies, the assumption follows that there must occur a continued input of live bodies into the games. From where do we get the live bodies? Will all of the new trap and skeet shooters come from the much-maligned ranks of the over-thirty generation? For economic reasons as much as any other, it does follow that most new trap and skeet gunners will be over thirty when they take up the games and become active club members.

But, what happens if the under thirty generation completely rejects guns and shooting as a way of life or a form of recreation? It would then seem that the growth of clay target competition would face a downward curve. If the mores and attitudes of the under-thirty group remain constant until and after they cross the magic natal anniversary which is supposed to give them a changed outlook on life, we might be in trouble. I say that we, meaning devotees of the clay target sports, might be in trouble for several reasons.

Early this year, I talked with a gun shop owner in the city of Berkeley, California. His shop is located a few blocks from what is admittedly one of the most liberal and activist campuses in the United States. He said that his business with the established shooter and hunter in 1969 was as good or better than it was in the record gun demand year of 1968. But, he said his Christmas gun sales were the worst he had experienced in twenty years of business.

The reasons he gave for the drop in

his 1969 Christmas sales get at the crux of our problem. He said that a number of parents had been in the shop looking for appropriate gun gifts, but had returned later and reported that they had learned that the kids were simply not interested and did not want guns at all. One parent did buy his son a gun, gun case, and cleaning kit which was placed under the tree on Christmas morning. When the boy opened his gift, he screamed that this was an immoral and obscene gift, refused to open the rest of his gifts, and stormed from the house for the rest of the day.

There are a lot of conclusions you can draw from this situation or from the behavior of this boy, but one of them has to be that this boy, and any like him, are not likely to take up trap and skeet later in this decade. At least, the prognosis at this stage is not good. Because it seems to me that it is not only futile but foolish to view with alarm unless you are willing to suggest an alternative or remedial action, I share some thoughts with you who cherish the games of trap and skeet.

I wrote last month's Pull column which describes in some detail the trap and skeet programs being conducted in the nation's colleges by the Association of Student Unions before I visited Berkeley and picked up the bits of information just described. I will concede for the record that not all colleges are so ultra liberal as Cal. in Berkeley, nor do the communities in which they are located nourish the sort of violent anti-gun attitude which thrives in the Berkeley climate, but I also offer the conclusion that Cal. and Berkeley are neither alone or unique.

This being the case, it becomes even more important to support all of the collegiate shooting programs (such as the excellent one at Indiana University) with a lot more vigor than we are now doing. It seems to me that this problem of attracting new shooters being faced by the shooting games

is not one we can sweep under the rug and say that we will face it when it becomes epidemic. In my judgement, that will be too late. We must start now with any program that is designed to forestall a crisis in the seventies, or eighties.

If the conclusions I have reached are true, (and these conclusions are supported by a number of knowledgeable people in the game) gun clubs no longer can wait for the new young shooter to show up at the club simply via a process of natural selection. Gun clubs, state associations, and national associations must put into operation some sort of sustained program to attract young people to the clay target games on a regular basis.

There are all sorts of possibilities along these lines, and almost any of them can make some sort of contribution to stimulating interest. We are told, and observe, that young people are followers. If we can get their leaders to decide that trap and/or skeet is the "in" thing, we ought to be on the way to success. How can we do this? A gun club could, for example, announce that a free shooting and instruction will be offered once a month (or week, depending on resources) for any of several groups, such as class officers, all honor students, athletes scoring the most points in any game, or being selected the athlete of the week, or being named to any sort of honor team. All students winning scholarships in a local area could be the guests of the club for a day of trap or skeet.

The criteria for this kind of approach are endless, and can be tailored to fit any local situation. Club facilities could be made available to any school group for an extra-curricular club organized for shooting. State associations could promote a state championship in trap or skeet with entries solicited from every school in the state. This event could be staged as an extra day or extra event in connection with any and all state tournaments. Winners could go on to compete in either the Grand or the NSSA skeet nationals.

I'm sure that individual shooters can do more than they have been doing to expose more young people to the fun of trap and skeet. How many kids of neighbors, friends, relatives, etc., have you invited to the club at least once?

Some readers will be sure to comment that all these suggestions are worthwhile, but whence cometh the money? Benefit shoots are conducted for just about every cause you can think of. What is a more worthy cause than insuring the continued good health of the shooting sports? One

dollar more added to the entry fee of any state or national shooting event would not turn away any shooter, but the total dollars so acquired would provide the bread for a lot of the programs I have suggested (and there are many more possibilities than I have mentioned).

There is another prime possibility for changing or molding the thinking of young people with respect to the shooting sports, and that is the burgeoning concern for ecology, which does "turn on" many of the young student activists. During my years with SAAMI, I attended an Outdoor Education Project workshop at Purdue University in Indiana. One of the professors told the workshop that he was personally opposed to hunting and shooting, but that his concern for conservation of our natural resources had demonstrated dramatically to him that only the constant demands of hunters and shooters for places to hunt and shoot had saved serious deficiencies in our water table and other ecological considerations. He admitted that only the revenue obtained from the 11% excise tax levied on guns and ammunition via the Pitman Act had saved many conservation programs from utter disaster.

Shooters today have never had a more perfect opportunity to constantly remind the ecology activists that the funds generated from our "doing our thing" have made it possible for them to enjoy forests, wetlands, lakes, rivers, and parks for ten or eleven months of the year while we ask only a month or so in return for our very substantial investment and contribution. And, we should not miss a chance to shout from rooftops that all the ammunition we consume at gun clubs generates a lot of revenue for their pet projects with no competition at all from us for the resources.

It is a known fact that you can't often reason a person out of an idea he holds as a result of prejudice, because prejudice is based on emotion rather than reason. But, you can sometimes make progress with such a person on the basis of a conclusion that you share in common, and that's where the contribution made by trap and skeet shooters to preserving our natural resources comes in.

There is a lot we can do, individually and collectively, to keep our clay target games healthy. The time to begin is now. Tomorrow may be much too late.



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(Continued from page 13)

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by expanding the Norma cylindrical brass to .487" to take the Kynoch .510 bullet, as made for the .500 Nitro express cartridge, the bullet weighing 570 grains. In making up this experimental wildcat I turned about 1/4" off the heel of the bullet down to the .487 diameter, leaving a sharp shoulder to prevent the bullet from setting back into the case. In other words a "heel" bullet somewhat like the .22 long rifle bullet. There is very little taper to such a cartridge as this and the magazine should be widened in front otherwise it will not feed properly. This cartridge loaded with 90 grains of 3031 will approximate the power of the .505 Gibbs. I found it quite deadly on old Tembo, dropping them on shoulder shots. Since returning home I have made up several versions on the .460 Weatherby brass. The full length shell actually holds too much powder. A large shell, only partially filled with propellant invites trouble through bullets being hammered back into the casing due to the recoil.

"I tried cutting off the cases with very satisfactory results. I finally wound up with something similar to the "short, long and long rifle" loads we use in the .22 rifle. Since 90 grains of powder was all that was needed to kill elephants, behind the 570 grain bullet, why use more? A case shortened to 2 1/2" takes the necessary 90 grains of powder very nicely. This about fills the case leaving little airspace. If you want a blockbuster it can be made to take 114 grains of H-375 ball powder. This then delivers a good deal more power than the .505. The .460 Weatherby brass, when necked up to .50 caliber, sometimes results in wrinkled brass at or near the muzzle. For this reason it is all the better for being cut off. I can see no need for any length of shell in the .500 wildcat other than my 2 1/2" length.

"It may be of interest to have my explanation as to why I think the .470 caliber bullet and the 570-gr. .50 caliber bullet are so deadly on elephant, as compared to the .458 caliber bullet. On my return home after my last round with the big stuff, I shot several of the big calibers into wooden blocks to get relative penetration. I found that neither the .470 nor the .500 would give clean penetration in heavy tough wood blocks without tumbling. About 18 inches within the block these big bullets would commence to go crosswise. This must be

the reason they put an elephant down so quickly with a shoulder shot. A similar test with the .458, a round nose solid, on shoulder hits would many times see the tusker go a half-mile before he dropped. And he might just keep right on traveling.

"As to the rifles I used on these several expeditions, on my first safari I took a .375 Magnum and a .505 Gibbs. The second trip, which really commenced my elephant killing, I had a .458 Winchester, a .450 Magnum of my own creation and a .460 which I had made up, as I told you on the .378 brass, which was even before Weatherby announced his own .460. I called my cartridge the .45-378. I don't know that my version of the cartridge was the first one, but I made it up in 1956 and used it in Africa in 1957.

"The third trip I used the .450 Magnum and kept the .458 Winchester as my second rifle. On the fourth safari I hunted with the .470 Magnum and the .510 caliber, as I have told you. I also had the .505 Gibbs along.

"You have asked what kind of an average I had for shots fired per bull brought down. To be frank with you I never kept any record of the shots I fired. On buffalo I can remember sometimes taking five and six shots to get a bull down. However there were also many one-shot kills and I believe I would be honest in saying that at least half my buff were accounted for with one shot each. The others, however, took 3 to 4 shots each. On elephants, at times, I had my share of difficulties. I would shoot too far, heads would be moving, brush and trees would get in the line of sight, and this coupled with bad holding on my part would see my sometimes take two and three shots per animal. On my last safari I did better. I suppose I was growing more accustomed to the game and better recognized the location of the brain. I had a lot of one shot kills. The bullets I was using was an important factor too. The .470 and .510 bullets have a tendency to tumble and make simply terrific wounds after hitting heavy bones. The .458 Winchester and Hornady steel jacketed solids, on the other hand, bore right through, thus deliver less shock if the brain is missed by a small margin. Later on I commenced to take the shoulder shot if the head was in a difficult position and the .470 and the .510 were both quite deadly on these shots. The .458 was appreciably less.

"I have asked professional elephant

hunters about how many shots is customary per elephant when shooting on control, where many times shots must be taken under something less than ideal conditions and they have told me that about two shots per animal is the average. I suppose maybe I averaged about two shots per tusker all the way thru but I am sure I used many more finishing shots than was actually needed. My native boys would always clamor, "Piga Tembo, hapana kufa—shoot the elephant he is not dead"—even when I was certain he was just as dead as he could be. At the same time I did not want any of my bulls getting up and walking away without their tails (the native boys cut off the tail and take it back to camp) and so far as I know only one ever did. That one fell so hard I was

enced white hunter with me, a fellow named Preston, also our Kikuyu tracker is an expert with the rifle and he always slammed at least one bullet into the buff following my first shot. We had some near tragedies during the time I took seven buffalo, I'll tell you!

"On one old bull in particular, I remember, Preston used up all his cartridges trying to chase this critter out in the open where I was waiting to wallop him. But the buffalo would not quit the heavy cover and Preston finally lost patience and slammed three .450 Nitro Express soft points into the buff's neck. These failed to do anything more than just make him madder, did not shatter the vertebra, and were pretty much useless. Preston then came out to me and said he



"The buffalo that charged me and fell on me after being hit."

sure he was finished and so I ran on to catch up with the fleeing herd, neglecting to check on this one. That eve he had vanished."

On the last safari made by the indomitable Buhmiller, he shot few elephants. His hunting was mostly for buffalo and his adventures with these fearsome brutes is worth recounting. He wrote me; "You see these marauders, mostly lone buffalo bulls, get very smart and they go into the shambas at night and eat maize, peas or whatever is growing in the natives' gardens and then before daylight they move out. Since it rains so much the ground remains soft and it is no chore to track them down. The only problem is that they hide in cover so extremely dense you cannot get up to them without inviting trouble."

"This would be a suicide job for one hunter alone. I had a very experi-

enced white hunter with me, a fellow named Preston, also our Kikuyu tracker had also slammed about 5 or 6 9.3 mm bullets into the bull and with the same negative results.

"I said, 'No don't go home. I'll go in and get him myself.' And in I went! I went in and the buff met me half-way. He decided to charge around some dense bush and I did not get a clear whack at him until he was about 6 feet distant. I fired one of my flat-nosed wadcutter (the .458 bullet reversed) which went through both shoulders, shattered the far shoulder. Then he came straight for me. I tried to back up but stepped into a hole, tripped and fell flat on my back. The bull had rough going too and as he now could only move on three legs,



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he fell with his horns across both my legs just below the knee. He was up almost as soon as he had fallen and as soon as the pressure of his horns was off my legs I rolled out of the way. It was down hill which helped my roll. The bull was so far gone from my shot he did not try to get at me again but staggered on about 30 feet and collapsed. I looked around for my gun but could not find it. The buff had knocked it out of my hands and had stepped on the small of the stock. My

Kikuyu soon found my gun and we followed-up on our sick bull. He was down but not dead. I put a finisher behind his ear."

The remarkable thing, maybe, about John Buhmiller, is that he did all this adventuring after he was 60 years of age. Another equally amazing fact is that the most of the rifles our gunsmith was shooting develop recoils in the 80-100 lb. range. John Buhmiller stands 5' 5" and weighs 135 pounds.



HAWKEN RIFLE

(Continued from page 28)

Here, many rifles were restocked, barrels shortened and re-rifled, and repairs attended to in many other ways. At this point the Hawken shop began to furnish most of the guns for the Missouri Fur Company. This organization had been formed by prominent St. Louis business men in the winter of 1808-9, and included many of the best trappers, traders and hunters in the West. Jake worked alone in his shop from 1815 to 1822, rebuilding rifles for the adventurous backwoodsman who trapped and scouted thousands of miles in the Rocky Mountains. Gradually a new form of rifle began to appear from the Hawken shop and improvements were constantly added.

It is not certain how the Hawken brothers agreed to "throw-in" with one another, however, after Sam Hawken's first wife died, he decided to leave Xenia, Ohio and come to St. Louis by way of New Orleans, on a steam boat, and landing there June 3, 1822, greeted his brother Jake. It seems evident that Sam had much influence on his brother's business. The shop was moved to several locations after Sam joined his brother, and many other decisions were made by Sam during their reign in St. Louis.

Other earlier gunsmiths in this fast growing fur metropolis were already meeting the demands for expeditions; Le Conte and J. V. Bouis, before 1819; Louis Salomon Migneron, and James Lakenam. But after Sam moved in as a full partner in Jake's establishment, the shop's vigorous administrative strength doubled and its capital increased.

About this time, General William H. Ashley gained prominent recognition as leader in the Rocky Mountain Fur Company. In 1823, Ashley organized an expedition to penetrate to the head waters of the Missouri, and he armed his best marksmen with Hawken rifles. A large caliber rifle was made special for the General—thought

to be the largest Hawken made, being .68 caliber. The barrel of this king-size piece was three feet six inches long and it carried an ounce ball. The powder charge is unspecified, but it must have been approximately 200 grains of FFg powder. Using this rifle on a summer hunt in 1824, the General killed a huge buffalo at a distance of 280 yards with one well placed shot. This is surely some kind of distance record for a buffalo kill with a Hawken. The shop of Jake and Samuel Hawken was ideally situated to receive a great share of this new business, and the rifles they turned out for this specialized trade were to become known as the "Hawken Rocky Mountain Rifle," or simply . . . the "Hawken Rifle." When a trapper was asked the whereabouts of a certain gentleman hunting in the mountains, his reply might have been; "Out in the pinyon, with his big Saint Loui gun—a Jake Hawkens gun, she was."

A great many more Hawken flintlocks were made than is generally supposed. There are no records showing just when the Hawken shop began to turn out arms of the percussion cap system, but it is with great interest to note that for a mountain man, a thousand miles in the wilderness, the flintlock was most useful; and held certain advantages over the percussion cap rifle. A properly built flintlock could be fired with a makeshift gun flint. While percussion caps were not too readily available, and many were lost or ruined by moisture. At first the mountain man grumbled at the necessity of carrying caps for their new rifles, but soon realized that flintlocks were outclassed by the percussion firing method, which was well established by 1840.

Early Hawken rifles were generally made with a full stock, but later the half stock was favored. Jake Hawken is believed to have made a great proportion of early full stock rifles, between 1835-45, and because of the

severe conditions under which they were used, their survival rate is very low. It was, however, the half stock, ribbed models that became widely acclaimed. The primary reason for the development of the half stock rifle was to eliminate the problem of breakage of the long wooden forearm.

Aside from the production of the "Mountain Rifle" the Hawken shop made belt and saddle pistols in both flint and percussion up till the middle 1850's, and pistols were marked both "J & S Hawken" and "S. Hawken. . . St. Louis." Locks varied: some being of the ordinary "warranted" variety, others handmade in the Hawken shop. R. Ashmore, an English maker was an early supplier of locks for the Hawken Rifles, and a few have turned up with locks stamped with the name "Meier." The St. Louis business directory lists Adolphus Meier as dealer in rifles and

the St. Louis levees to order rifles, stock up on powder and lead bars, and spin more than one past adventure with blood-thirsty realism.

As business prospered, a system of production evolved whereas one man might work on one particular component of the rifle, and through this simplified method of mass production can one identify certain characteristics of the Hawken rifle. Most Hawken rifles weighed about 10½ pounds, should it be a full-stock or half-stock. The half-stock does not actually reduce the weight of the rifle, as one might think, but it does render the forearm of the rifle less liable to breakage. Some Hawken rifles did weigh up to 12 to 15 pounds, however these rifles were the exception, rather than the rule. Rifles such as these were made up on special order for customers who wished the ultimate in



pistols. Jake and Sam took every advantage to obtain new ideas from the gun market. When the patented hooked breech came into use, it was promptly adopted by the Hawken shop.

It was at this period that the long, full forestock was shortened and replaced by a metal rib and thimbles for the ramrod. The upper tang was lengthened and tied to the long trigger bar with two screws passing through the wrist, thereby strengthening this notoriously weak area on a muzzle-loading rifle. By 1832, the Hawken Brothers employed a handfull of gunsmiths working around the clock—and still the demand for rifles exceeded the supply. Rifles marked in capital letters "J & S Hawken-St. Louis" between 1822 to 1849, definitely show the effective partnership of Jake and Sam. Bill Williams, Joe Meek, Mariano Modena, among other famous "buckskinners" of the period journeyed to the Hawken shop near

long range accuracy and shocking power.

The earliest known advertising by the Hawken shop is a listing in the St. Louis business directory, published in 1821, "Jacob Hawken, Gunsmith, 214 North Main Street." After the partnership of Jake and Sam, and sometime before 1836, the gunshop was moved to Number 21 Laurel Street. Besides his duties as a crack gunsmith, Sam Hawken did take time out for community affairs. Being a good citizen of his newly found home, St. Louis, he took part in politics and helped to found the Union Fire Company No. 2. The 1838-39 St. Louis directory has this listing: "Union Fire and Hose Company No. 2, Samuel Hawken, First Engineer."

Charles E. Hanson's "The Plains Rifle," states that Samuel Colt wrote a personal letter to Sam Hawken in 1847 asking his opinion on the possibility of establishing a Colt Armory

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in St. Louis. The letter was headed "Confidential," giving intimate details to Colt gun sales in 1846-47. Another letter written by Sam's brother, J. B. Colt, on June 10, 1847, from Paterson, New Jersey, to a James H. Lucas of St. Louis, states that Colt offered to establish the Colt Firearms Company in St. Louis if local investors will supply the necessary funds. The offer was rejected by Lucas, who later may have regretted his decision.

Jake Hawken remained silent on any part of community affairs and continued his work at the Hawken's shop. Probably the death of his wife, Catherine Allison, in 1832 had much to do with his seeming disinterest in public affairs. It may have been that in 1832, with the new Cholera epidemic in St. Louis, Catherine Allison may have come in contact with this dreaded disease. Nevertheless, the

record of Cholera in 1832 was never kept, and never known. However, it could not be comparable to the epidemic of 1849. Emigrant ships from Europe brought over a great deal of Cholera, which infected New Orleans in the latter part of 1848. The visitation of Cholera was first noticed in St. Louis late in December, 1848, and the epidemic was soon established, with deaths increasing from 8 in the first week of January 1849, to 722 in the last week of July of that year. The highest total of deaths in this year, in one day, was 145. The great increase in cases came as the weather grew warmer, and confined to particular unhealthy localities as St. Charles Street, Washington Avenue, west of Eighth Street, parts of North St. Louis, and some localities in the south end of the city. The week of May 6-13, brought 181 deaths. It was during

this week, May 7, 1849, that Jake Hawken fell ill with Cholera. The "Missouri Republican" printed this in the obituary column, May 9, 1849; "At Half past 7 o'clock, on the eighth instant, Jacob Hawken, Sen'r, in the 63rd year of his age. His friends and acquaintances are required to attend his funeral this afternoon, at 3 o'clock, from the residence of his brother, Samuel Hawken, 156 Sixth Street, between Morgan St. and Franklin Ave."

With a gifted craft, Jake Hawken built a rifle for a specific need, as an instrument, or tool of the trade, for men who swore by its endurance and performance under exacting conditions. Jake not only laid a foundation for business during a new era in America's early history, but helped build a tradition which lasted as long as a hundred years of gun making.

Continued next month

GUNS WITH WINGS

(Continued from page 35)

and readily available. It consisted essentially of the basic ground model converted to air cooling by perforating its water jacket; lightening all recoiling parts and adding a muzzle booster and buffer to increase rate of fire; overall lightening; and fitting of remote firing controls. Later, the bulky fabric feed belt was replaced by disintegrating metallic links which the gun handled easily after minor alteration. These links represented a significant improvement and are standard in all modern MG's. As the war progressed and aircraft performance ceilings improved, gun failures due to freezing at high altitude became more common and electric heating systems were developed and fitted first to the Vickers fixed guns. This was also applied to flexible Lewis guns—but was less necessary there, since the gunner was in a position to clear stoppages by hand; the pilot was not.

In the meantime, with the adoption of the Fokker interrupter gear, the Germans modified the basic Maxim '08/15 MG to supplant the Parabellum as a fixed gun. This was done in exactly the same manner as England had with the Vickers. After all, the two guns were identical in principle and based on the same patents of Connecticut Yankee weapons genius, Hiram Maxim. From performance and reliability viewpoints, the "Span-dau," as the aircraft '08/15 was called, equalled the Vickers.

In spite of the great effort exerted in development of fixed aircraft guns, I've read reports from pilots of the

day indicating that malfunctions and failures were quite common. The journals and autobiographies of the top aces on both sides of the conflict are replete with instances of partial or complete failures with necessitated breaking off the action or resulted in

placement for the Vickers from the gas-operated Browning/Colt M1895 ground gun. This was an interim program intended to suffice until the new designs on which John M. Browning was working could be fully developed. Interestingly, at the time, Colt's was



A .303 Lewis gun with a single fixed .303 Vickers mounted on a French Nieuport 27. Lewis was used as a back-up gun.

the death of both comrades and enemies. Consequently, many other designs were attempted, but none except the U.S. Marlin .30 became highly enough developed to see combat service before the end of the war.

Recognizing the deficiencies of existing fixed guns, and being without any suitable native designs, U.S. authorities assigned Marlin Firearms the task of developing a satisfactory re-

producing the Vickers in vast numbers for all the Allies.

Swedish-born Carl Swebelius of Marlin redesigned the M1895, substituting a straight-line gas system for the original swinging lever and making many internal changes. The result was the M1917 which met U.S. requirements. It was placed in combat service early in 1918 with both French and American squadrons. Swebelius

continued development, producing the M1918 version which was acclaimed by pilots in France as superior to the Vickers. At this stage of development, the Marlin bore little resemblance to the parent Colt, except in principle, and hardly any parts interchangeability remained. As the war ended, the A.E.F. Commander was demanding complete and immediate re-equipment of all U.S. fighter aircraft with the M1918 Marlin MG.

Early in 1917, it had become evident that rifle-caliber machine guns could not hope to cope with armored aircraft being placed in service by Germany. An example of this was the death of Quentin Roosevelt during his last attack against an armored German "Gotha" (Gotha Waggonfabrik multi-engined bomber). Observers saw Roosevelt's tracers bouncing harmlessly off the Gotha's belly armor while a concealed 7.9mm Parabellum cut his little fighter to pieces around him. Consequently, all the major powers began attempts to develop more powerful guns capable of penetrating such armor as could be carried by operational aircraft. Britain scaled up and redesigned the Vickers to accommodate a .50 caliber cartridge sometimes referred to as ".5-inch Vickers-Armstrong." Neither the gun nor the cartridge reached an acceptable state of development before the War ended, first seeing service in the early 1920's, and, subsequently, being adopted by Japan and Italy.

In Germany, great secrecy surrounded the development of a 12.7mm T.u. F. (Tank und Fleiger) gun based on a modified and enlarged Maxim. Fortunately for the Allies, no such guns ever reached the front, though some 4,000 were ready for assembly and issue at the time of the Armistice. Virtually all were destroyed after the Armistice to prevent confiscation by the Allies.

Relatively early in the War, Russian 7.62mm Maxim/Vickers guns being manufactured by Colt's were modified to function with a modernized version of the old French 11mm Gras cartridge. While this gun/cartridge combination had the capability of being developed so as to defeat airborne armor, this was not done. The primary purpose of the exercise was to develop a gun that would deliver a larger-caliber explosive and/or incendiary projectile to destroy highly-flammable observation balloons more effectively than rifle-caliber ammunition. The 11mm Vickers was also used against enemy aircraft, but only with conventional ammunition at a velocity of about 2,000 fps; thus, its full potential was not realized.

General Pershing was cognizant of



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the problem, and based upon his recommendations, the U.S. set down specifications for a large-caliber aircraft machine gun: weight 50 lbs.; 670-gr. or heavier bullet; 2700 fps minimum velocity; penetration with A.P. projectile of 1½" armor plate at 25 yards. Working with Winchester, John Browning produced a scaled-up .50 caliber version of his 1917 .30 MG, adding an oil buffer for improved performance with the heavier cartridge. On 12 September, 1918, the prototype gun was fired at Colt's, and Winchester produced six additional guns in record time for firing tests to be conducted on the day of the Armistice. The gun was too late for WWI, but was the one design of the period that survived to see later service in any quantity. In fact, a few M1918 air-cooled Browning .50's were made by Winchester, but not until the 1920's did it finally receive further development—making it virtually a worldwide standard in a later war. Incidentally, the .50 Browning cartridge was essentially the U.S. .30 rifle round scaled up ⅔.

Consequently, WWI terminated without the development of a machine gun that could be mounted on contemporary fighting aircraft and still penetrate the armor used by Germany. No doubt had the War continued into 1919 as expected, all the major powers would have had .50 caliber guns in use on fighter aircraft.

As the War ended, the Lewis remained the standard Allied flexible gun; the Vickers the standard fixed gun except in U.S. squadrons which had received the Marlin; and Germany was equipped with Spandau fixed and Parabellum flexible guns. All operational guns were of standard rifle caliber (British .303 and U.S. .30, and German 7.9mm) except for the balloon-busting 11mm version of the Russian Vickers.

In the U.S.A. limited development of 1918 Browning .30 and .50 aircraft guns did continue, culminating with acceptable models in both calibers in 1921. At that point, the Marlin was discarded. Later, the true potential of the .50 Browning was realized by a few officers and by devious means, funds were obtained to continually improve it.

Eventually, the U.S. Naval Bureau of Ordnance became interested and it allocated \$150,000 for further development and testing and limited procurement of guns in 1932. In 1933, the Navy placed orders with Colt's for the resulting M2 .50 caliber gun. The Navy program was staunchly supported by the Army Ordnance and Army Air Corps personnel and also

by the Springfield Armory. No money was ever better spent, as subsequent events were to prove.

As a result, the .50 caliber Browning M2 aircraft gun was adopted by the U.S. for both Navy and Army use. By the middle '30's a few aircraft, notably the Boeing P-26 "Peashooter" Pursuit plane were fitted with a single Browning .30 augmented by a .50 on the opposite side in the usual two-gun synchronized installation. Originally, pilots were instructed to open fire only with the .30 until tracer bullets showed them to be on target, then fire a single short burst from the .50 to conserve the heavy, expensive ammunition.



Army helicopter mounting four M-60 machine guns.

By 1939-40, the modern P-36 and P-40 were fitted with two synchronized .50's in the nose, plus additional .30 Brownings in the wings. Aircraft with flexible guns carried single and twin M2 .30 Brownings which had been brought to a state of development that allowed reliable functioning at rates up to 1200 rounds per minute.

In England, little aircraft machine gun development had taken place. By the time WWI and M1919 Vickers were in need of replacement, the Browning .30 and .50 had become so highly developed that the new generation of fighters (Hawker Hurricane and Supermarine Spitfire) were equipped with them. As those two historic aircraft made their debut, they were fitted with the unprecedented armament of eight wing-mounted fixed M2 Brownings chambered for the standard .303 British rifle and machine gun cartridge—the same round that armed all previous British aircraft. As enemy aircraft became more difficult to down, some British fighters carried as many as 12 such guns in their wings, fire of all "harmonized" to converge at 200

yards. Much was made of the not inconsiderable "Buzz-Saw" effect. This light cartridge was criticized by many, but it must have worked—after all, the Luftwaffe lost the "Battle of Britain."

Not until well into the War did Britain make significant use of the .50 Browning. Then, it showed up augmenting cannon installations in late model Spitfires, and in aircraft such as the Mustang being purchased from the U.S. It was simpler and quicker to procure such planes already armed in the standard U.S. pattern and, of course, the virtue of heavier guns had become obvious.

The British were prolific users of

multiple-gun, power-operated turrets on heavy craft. Existing M1919 Vickers and .303 Brownings were utilized almost exclusively for this purpose, also in some manual flexible installations. Early in the War, many old .303 and .30 Lewis WWI guns were similarly used. At the end of WWII, England had converted almost exclusively to cannon for fixed aircraft armament and flexible guns of all sorts were on the way out. Hence, no further aircraft MG development.

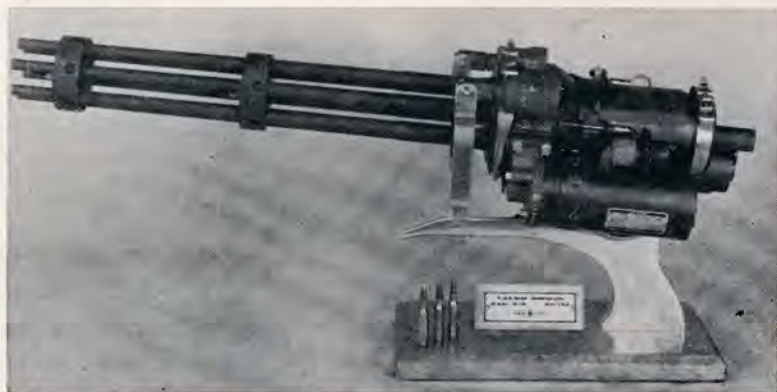
When WWII struck the U.S.A. directly in late 1941, fighter aircraft were being equipped mainly with the .50 M2 Browning, though older models in service still carried the M2 .30 as well. By early 1942, the .50 was standard on all U.S. fighters and was installed in pairs in power turrets on heavy aircraft. It was also employed in single and twin flexible installations in nearly all bombers. Only a few dive and scout bombers still utilized single and twin M2 .30's in the observer's cockpit. For all practical purposes, the M2 .50 became the standard U.S. aircraft weapon of WWII. Inasmuch as the U.S. furnished scores

of thousands of fighting aircraft to all the Allied Nations, it became virtually their standard, too. By 1944, the standard fighter battery consisted of six or eight (sometimes as many as twelve or fourteen) .50's in wings and/or nose. The few U.S. exceptions were the cannon used in some Navy fighters and in the Army's Lightning and Aircobra. Even those craft carried considerable .50 caliber batteries to augment the slow-firing big bores. It may well be said (and has, even by German authorities during the War) that the .50 caliber Browning was indispensable to the Allied Air War and that it was the outstanding aircraft weapon of WWII. It represented the height of aircraft MG development before its final eclipse in the 1950's by automatic cannon firing explosive shells. At one point in WWII, 35 planes of a U.S. fighter unit destroyed 72 enemy aircraft with an average expenditure of only 200 .50 caliber rounds per gun.

Germany had, in a sense, been fortunate in being forced to start from scratch in building a new series of aircraft guns. Activities of the Allied Armistice Commission, plus deliberate destruction to prevent confiscation had stripped Germany of WWI developments. In 1929, the Solothurn firm introduced a unique new recoil-operated, high-rate, 7.9mm aircraft gun which Germany adopted as the MG-30. It was designed by Louis Stange and constituted an unusually compact gun. It was developed into the MG-15 and MG-17 for aircraft use and received its baptism of fire on the Heinkels and Messerschmidts of the famous "Legion Kondor" supporting Franco in the Spanish Civil War of

only 40 lbs, fired 960 rounds per minute, and was the first practical machine gun to utilize electric-primed ammunition. This made possible the simplest and cheapest synchronization yet achieved. It became the standard big bore aircraft MG for both fixed and flexible installations throughout the War and also appeared in power-operated turrets. The vaunted ME 109 made much of its reputation carrying two synchronized MG-131's with its cannon. Virtually all German combat aircraft were fitted with this gun in at least some of their versions, though it did not completely replace rifle-caliber guns as did the Browning .50 in the U.S. Both fixed and flexible rifle-caliber guns continued in use throughout the War. In general, up until very late in the War, German fighter aircraft carried a mixture of one or more automatic cannon, two or more MG-131's and two or more rifle-caliber guns. After the MG-17 and MG-131, little effort was expended on aircraft MG development in Germany; cannon work was considered more worthwhile.

France contributed little to aircraft MG development between the wars. Worthy of note, though, is the Darne gas-operated 7.5mm (rifle-caliber) intended to be the cheapest in the World. During the 1930's it was sold for \$28. Rates of fire as high as 1700 rounds per minute were reported by observers; French fighters of the 1930's were fitted with as many as four of these guns and a flexible version was installed in bombers and other multi-seat craft. What appears to have been potentially an excellent heavy-caliber gun was developed in the 13.2mm Hotchkiss, descendant of



The G.E. "Mini-Gun", caliber 7.62mm fires over 6,000 rounds per minute.

the 1930's. Luftwaffe officials were so impressed with Stange's design that they ordered development of a big bore MG based upon it. The result was the MG-131 by Rheinmetall-Borsig which became operational in 1938, just in time for the opening phases of WWII. In 13mm caliber, it weighed

the highly successful WWI Hotchkiss ground guns. However, as in most French weapons development of the day, a ridiculous degree of secrecy slowed progress to a standstill; France was overrun before it could ever be placed in service in any quantity. No other French guns of consequence

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were produced, nor did any of these have significant effect on the War during the short period before France's capitulation.

Italy found itself in much the same position as France in that no native guns had achieved success in WWI. In the early '30's, Breda finally produced a sound design that was developed into successful 7.7mm and 12.7mm aircraft guns. In fact, the 12.7mm was the first modern big-bore aircraft gun to see combat. It armed the Fiat CR-32/42 aircraft the Italian Government sent (with crews) to fight in the Spanish Civil War. The 12.7mm gun was employed almost exclusively in fixed installations while the 7.7mm version was also used extensively in the flexible mode.

Japan had produced no aircraft MG's during WWI and was content even afterward to copy what she thought good enough. This included the M1919 Vickers, Lewis, German MG-15, and Browning—all in rifle caliber. Of the lot, the Browning was most favored, so it was also copied in 12.7mm caliber, utilizing a cartridge about equal in performance to the .50 Browning. Early in the War, Japan settled upon fighter armament of paired synchronized 12.7mm Brownings combined with multiple cannon.

Following WWII, the dominant aircraft machine gun was the .50 Browning in M2 and later M3 versions. Virtually all surviving combat aircraft not armed with cannons carried it. It was used all over the world in various later conflicts: Palestine, Indo-China, Africa, Latin America, etc. When jet aircraft became operational in the late 1940's, the U.S.A. continued to use it because of its superb past performance. The F-86's that fought sanctuaried, cannon-armed MIG's to a standstill in Korea carried six of the latest Brownings firing at a rate of 1200 or more rounds per minute.

However, the Korean War sounded the death knell of the aircraft machine gun. Light, high-rate automatic cannons firing explosive shells had

eclipsed it completely, just as jets had forced propeller-driven aircraft from the skies. Both prop jobs and machine guns were to linger on, even until today, for special purpose work, but their days of intentional air-to-air combat were over by the mid-1950's—40 years from birth to death.

But, then came a new name for a kind of war that had been waged since antiquity; counter-insurgency, they called it. One of the best ways to counter insurgents (rebels, guerillas, what have you) turned out to be delivering an extremely high volume of rifle-caliber automatic weapons fire from the air against any suspected or known hiding place. No matter how well they might be hidden by jungle or camouflage, a few thousand rifle bullets sweeping through the area would route or kill them if delivered in short enough time and large enough volume.

Enter the MINIGUN which owes its existence to one Dr. Gatling whose guns were used in the American Civil War. The basic Gatling has been developed into the formidable VULCAN 20mm aircraft cannon (of which more later) so was now scaled down in the middle 1960's to produce a 35-pound, six-barreled package of dynamite handling the 7.62mm NATO rifle/machine gun cartridge. Driven by an external power source and supplied by a large-capacity positive magazine feed system, it could (can) spew out .30 caliber projectiles at rates in excess of 6,000 per minute. Today the Minigun sees daily service in Vietnam, providing what is called "suppressive fire." Cargo-type aircraft carry as many as three or four Miniguns, while single units are carried by helicopters and lighter fixed-wing planes. Because of the lightweight ammunition and gun, aircraft can fire continuously long after heavier guns would require landing for resupply. So, the Minigun represents the highest state of aircraft MG development reached in the years since Lt. Fickel fired those first rifle shots from Glen Curtiss's pusher biplane.

REPEAL THE GUN LAW

(Continued from page 21)

huge gun recreation area? Aside from the top echelon of men and women, there are 400 high school boys and girls. They pull the targets, keep the scores, clean up the grounds, operate the restaurant and do their chores some of our other high school boys and girls would not stoop to do.

That is the way it goes at the Grand. Gun Laws, who needs them among persons like those who visit here every year? What we do need are more neighbors who are trapshooting.

Bob Rankin

No matter where you live, there is a shooting club, hunting club or con-

servation club near you. If you don't already belong, you should put this high on your list of priorities. There is so much going on in Washington regarding gun legislation, conservation, etc., that most lawmakers welcome advice from the grass roots, especially, if it comes from an organized group.

It is so much easier for the individual shooter or hunter to have his voice heard, through an organization, that those who are really concerned about the future of gun ownership and the shooting sports will see to it that they become a part of the one or more organizations nearby which support legitimate gun ownership.

Joining one or more of these organizations is but the first step in getting the action you want out of Washington. You must become an active member of whatever group you join. Attend the meetings! Voice your opinions! Join a committee! Become more than just a name on the rolls; become the member who participates.

The rewards of your joining with others in this effort will be more than you might expect. You'll meet new friends, and perhaps even become involved in a new phase of the shooting sports. It could open up a whole new world for you today, while preserving the sporting world you know for future generations.

THE RIGHT AND THE JOY

(Continued from page 29)

any chances. Some people might think this funny; it scares the hell out of me. A man who would shoot a cow has no business within miles of a gun, because he is obviously either incompetent, drunk or insane.

On the rifle and shotgun ranges of shooting clubs all over the world thousands of guns go bang every day. If there are shooting accidents there, no one has ever heard of them. Why? Because on the range the shooter is expected to, and does, behave like an intelligent human being, and he is held to a standard of conduct that is unfortunately not insisted upon in the field. Anyone foolish enough to start firing at the targets before the range officer has cleared the area would find his membership card torn up before he has had time to put his gun down. The conclusion is obvious, to me at least: The people who frequent ranges and are steeped in the traditions and practice of gunnery are the ones who behave well in the hunting fields. The ones whose acquaintance with firearms is limited to a once-a-year jaunt to the field are the ones who are the source of danger.

There was a time, years ago, when the air was clean and the streams ran clear. There was a time when the murmuring forests were green and a boy could take his .22 and walk through them with his father, who would teach him the things he had learned from his own father. He would learn when to shoot, which is very important. He would learn when not to shoot, which is much more important. There are still some of us who are lucky enough to have the time and environment to carry on the good work from generation to generation, but we only kid ourselves if we

do not realize that such people, with the best will in the world, are a rapidly dwindling minority.

What can be done about it? In most of the Northern and Central States of Europe, anyone can go into a shop and buy a rifle or shotgun, but before he is permitted to take it into the hunting fields he has to pass a really stringent course of instruction which includes the techniques of stalking



and shooting, game recognition, track identification, spooring and following, the vital points to aim for, breeding and feeding habits, evaluation of potential trophies and, last but certainly not least, a review of the traditions, ceremonies and unwritten rules of the chase. Now a lot of fun has been made of the European hunting ceremonies, in particular 'giving the dead buck its last meal' by putting a green bough in its mouth, then blowing a horn and drinking a toast over it; but, to be se-



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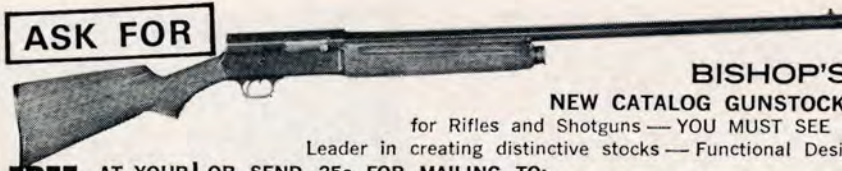
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rious, nothing can so graphically make you aware of the position of the animal in the hunter/hunted equation, or the respect due to the quarry.

Is there any reason why there could not be set up a system of hunter education, operated by the states in conjunction with shooters' groups and the arms companies, which would ensure that the hunter is capable of entering the woods and leaving them without shooting a friend, or maiming a cow, or doing any of the other things that are daily used by the anti-gun forces to bring the shooting game into disrepute?

This campaign of education could be carried out in conjunction with the education of the general public on the difference between bona-fide gun buffs and those who bring shooting into disrepute by vandalism or thugery. And it is here that the public needs to be educated in the difference. Notice this statement, please: *The public needs to be educated in the difference.* The public hears the word 'gun' and becomes hysterical. We are the ones who have the responsibility of making it perfectly clear that there is a world of difference between the behavior of the real sportsman, and the once-a-year 'hunter', and the criminal who happens to be armed with a firearm, although he could just as well be armed with a meataxe or a bronze statuette. All the non-shooting public can think about is a law abolishing guns. There is nothing wrong with passing a law—drafted by sportsmen—to deal with the root problems; there is everything wrong with passing a law that will hamstring the honest man and bypass the criminal.

Consider. In Switzerland, when you have done your military service, you are *required* to take your rifle home with you and keep it ready to go at any time; and in case there is any doubt in your mind, the Swiss Army rifle is not William Tell's crossbow—it is a deadly, efficient, modern self-loader with full-automatic firing optional. Also, any good gunshop will quite legally mount a silencer on a pistol for you. According to the pass-a-law boys, then, Saturday night in Geneva should be like the Battle of the Somme. Strange, I lived in Geneva for four years, and the only murder I remember—though I am sure there were others—was committed by a halfwitted pervert who used a kitchen knife on his boyfriend. So what do we do? Abolish knives? Pass a law? Does anyone seriously maintain that there is even proportionately more firearm-based crime in Geneva than in New York City? Or Newark? Or London? Or Paris? What propor-

tion of crimes is committed with legally acquired arms anyway? Can anyone imagine a criminal walking into the showroom of Throckmorton and Fitch to order a gun for a crime:

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"The Central Avenue branch."

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There is one other thing that has to be mentioned, unpalatable though it may be. The world is gradually evolving towards civilization, but it has a far way to go before it reaches that blessed state, when men will not covet their neighbors' goods, nor attempt to impose their will on others by force. It would be ideal if there were no need to protect oneself from any emergency, from any breakdown in the normal process of everyday living, but anyone who believes that we have already attained that state is living in cloud-cuckoo land. There is one very good reason for owning a gun, quite aside from any value it may have as a plinking, target or hunting gun, or for use in the various growing competitive sports. It is this: Until the world reaches perfection in the rule of law, there are unforeseen times when the civil order, which is the basis of all civilization, breaks down. When that happens, we are back in the jungle and a man has to defend himself with what he had handy. And between the drugged punk coming into the house with a knife in his hand, and the householder facing him with a pistol in his, I know where justice lies.

These are some of the points about guns and gunning that interest shooters, and if I have so far tended to emphasize the negative aspects, it is because I would rather we do it ourselves than have the smart alecks with bleeding hearts and unbuttoned minds do it for us, and believe me there is no shortage of those.

We have to make our position known, and we have to do it our-

selves, because no one else will do it for us. If, say, a general-readership magazine decides to bolster its sagging circulation by blasting shooters, it will do so, even if it has to bend every law of decency in the process. A few months ago a car magazine printed, out of a blue sky, a spiteful attack on the NRA and shooters in general. The next month, it printed a selection of letters from irate readers on the subject. I say 'selection' because without exception the letters were abusive, intemperate and barely literate. Now you can be sure that many shooters wrote serious, closely reasoned, reasonable letters. But the editor chose to print only those that cast the writers—and hence shooting itself—in a bad light, and followed each with a superior, smart-aleck remark. It is an editor's right to print what he pleases, and he obviously chose those letters that reinforced his point of view that shooters are wild and vindictive morons. Anybody with the bare minimum of acquaintance with the shooting game and shooters could have set him straight, but reason and fairness do not sell and cheap sensationalism does. Incidentally, one of the best-known writers on sports cars, a former racer, is also one of the best-known shooting and hunting writers. His opinion was not given.

Every day someone steals a high-powered car and goes careening about the roads and stops only when he crashes, with lethal results for one or more people. What would the editor of our glossy car magazine say about that? Who is responsible for the tragedy, the finely tooled machine or the punk who used it as a misguided missile? I myself have been a witness to an incident in which a man attempted to murder another by running him over with his car. So what do we do? Abolish cars? Pass a law?

The asinine vaporings of those who buy popularity by attacking shooting and hunting would not, in themselves, be important. The danger is that the mischief makers will succeed in connecting in the public's mind two unrelated subjects 1) the increase in unpunished violence, which is obvious, with 2) the increase in the popular interest in firearms and shooting sports, *which has nothing at all to do with it*. If they do that, they may succeed in passing enough repressive legislation to do irreparable harm to the shooting game.

And that is important, because shooting is important.

(Part II Next Month)

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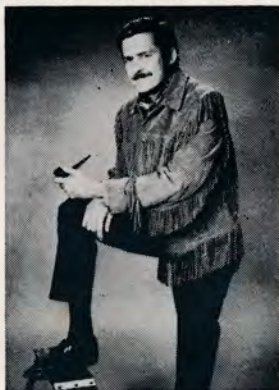
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GUNS OF COWBOYS

(Continued from page 23)

his old '73 in the corner for good.

Here was a gun to gladden his heart! It had everything he had found good and desirable about the '73, and in addition it shot a powerful cartridge that permitted him to kill at ranges far beyond the capabilities of the .44. Along with this it rode in the scabbard quite as well, had no more weight, no more length, and was even more sturdy and reliable. The Texas Rangers, most of whom were cowboys before pinning on the badge, clung to the Model '73 until the .30-30 Model 94 was announced. They ignored the interim guns, the '76 and the '86, altho individuals did buy and carry these more powerful rifles. The Lone Star

working cow-poke was seldom seen with any of the new fangled hardware.

There were good revolvers at the time. Guns like the Smith & Wesson .44 American and the .44 Russian, both antedating the Colt '73, but few held any charm for the westerner. The Winchester .44-40 rifle persuaded numbers of cowpunchers to choose the Colt Single Action in .44-40 so that one belt of hulls would do for both the Winchester and the belt gun. When the .38-40 was announced in 1879, there were some riders who bought a six-gun to match the rifle. Later on—altho granted it was rare—there were some cowboys who packed



Soldiers of Pancho Villa at Juarez with Winchesters and Mauser rifles.

State bought the 1873 for its officers but did not elect to purchase the more modern Winchesters until the advent of the .30-30. It has been a popular arm with the western rider ever since, be he cowpoke or sheriff.

As for the belt gun during these lively years, the decades encompassed by the '70s, '80s, and '90s, the cow-waddy clung to the old Model '73 forty-five Peacemaker. There were new handguns coming along and new cartridges but these had little influence on the man of the brush country. In 1877, Colt introduced its first double action revolver. This was the Lightning Model or as it was more commonly called the "Bird's Head," in .41 Long caliber. It is stated that Billy the Kid used a Bird's Head for the most of his killings; and John Wesley Hardin, who it is claimed shot down forty men during a bloody career, also swore by a pair of .41's. Be all that as it may, the ordinary

the '73 rifle in the dinky .32-20 caliber and had a Colt to match. I used to ride the Tex-Mex Border with a border patrolman who had a matching pair of guns, both .38-40 caliber, one the old '73 Colt and the other the Winchester Model 92. He thought he was well armed. Mostly, however the man of the plains wanted the .45 Long Colt cartridge and if he had to pack along a rifle of another caliber he simply had Tio Sam Myres sew a cartridge belt which would hold both.

The automatic pistol commenced to appear during the 1890s and into the first years of the new century. The .30 Mauser was developed in 1893 and it was followed by the .30 Luger in 1900 and the famous 9 mm Luger in 1902. If you think the cowboy considered the double action revolver new-fangled, his attitude toward the self-loading pistol was unprintable! The automatic had utterly no impact on the early westerner. He would have

In Mexico, a cattle country and filled with vaqueros, every rider packed a six-shooter. The rifle was not nearly so evident but the revolver was considered as indispensable as your pants. Here, unlike bordering Texas, the Mexicano horseman strapped on whatever he could find in the way of one-hand ordnance. The Colt .45 was highly prized but none too plentiful. The Merwin-Hulbert, the Hopkins & Allen, the Smith & Wesson in the .38 S&W caliber (first made in 1877) and the .44's—the American and the Russian Models—were eagerly swapped for by the guns hungry vaquero. From Europe, and especially Spain, came some pretty crude revolvers and long before our riders had seen automatics the weapon was common below the Rio Grande, and not disdained as it was on the Tejano side of the river.

Such rifles as filtered into the land of manana were eagerly sought after. Among American makes the Model '73 was a prime favorite. But there were many single-shot models, among these the Remington and the Sharps. When the Mauser commenced distribution out of Europe it quickly penetrated Mexico and altho it was bulky, too long and awkward on a horse it was lashed aboard the Chihuahua saddle and packed willingly. In 7 mm caliber it out-ranged and out-gunned the Texan with his dinky .44-40, and later on the .30-30. Game is scarce in Mexico today, its decline dates from the advent of the 7 mm Mauser. Unlike his gringo counterpart who is not a hunter, the Mexican vaquero is a meat hunter and he never overlooks the opportunity to fetch into camp a deer haunch. And it does not matter whether it is buck, doe or fawn.

rifle in .30-30 was introduced it was quickly accepted by the westerner. Among a lot of law agencies who quickly saw the good points of this thoroughly modern gun and cartridge were the Texas Rangers. The State bought the rifle for its members and when a recruit was taken into the force he had the price of the gun taken out of his pay until the state was fully recompensed. Then when he quit the Rangers he took his rifle with him. The older Winchester Model '73 was completely withdrawn but the Colt Model '73 continued as the standard sidearm. It was so well thought of that the Rangers carried the old gun well into the 20th century. When finally a switch was made to the double action, a lot of the old timers in the service elected to cling to the Frontier Model. You will find the gun in the force to this very day.

Model '94, the '95 was a popular gun with many western riders. The Texas Rangers who had ridden along from the late '70s until the mid-90s with the old Model 73, promptly commenced to lay the .30-30 aside and buy the more powerful .30-40. It was an item of issue and all the Ranger companies were provided with the rifle. By 1908, the '95 could be had chambered for the .30'06 cartridge. Eventually it was purchased by some Rangers from their own pockets, they being among the few who knew something of ballistics and the even better performance of the '06 cartridge over the older .30-40. The Model '95 was continued in the Ranger service until the 1920s. Among cowboys you will still find the rifle in use. During a 700-mile swing through the Great Bend of Texas, that great stronghold of the old-time cowman, I counted three Model '95's, two of them for the .30-40



Jorgensen rifle as our service arm went unnoticed by the cowman. He had no use for bolt action shooting irons and altho the U.S. Cavalry carried the weapon in carbine form quite successfully all up and down the border, it held scant charm for the chaparral-riding residents. But the cartridge was another thing. It appeared in a brand new rifle. The Winchester Model 1895 lever action. The gun and its load had a considerable impact on the cowboy. He went off to the Spanish-American War and there he saw what the 7 mm Mauser did in the hands of the Spaniards. When he got back to his home on the range he found the Winchester '95 and the new .30-40 cartridge were virtually as good.

During World War I, the cow waddy went off to war in numbers. Thousands of them. There was not enough .45 auto pistols to arm all the NCOs so the Army fell back on Colt and Smith & Wesson for revolvers. A double action revolver known as the Model 1917. It was a whale of a good gun. Chambered for the .45 ACP cartridge, it had to be loaded with two half-moon clips. This was virtually the cowboy's first introduction to the double action revolver. He liked the gun and when he came back from the bloodletting he remembered the good dependability of the Model '17 handgun.

63

wise to leave its imprint. He liked the range, the accuracy and the utter dependability of the '03 rifle. He was apt to call the cartridge the ".30-30" partly from the fact that the head of the casing was stamped .30 caliber and partly from mis-information fed him by poorly grounded instructors. But he knew the new cartridge shot rings around his old saddle carbine. When he got back to his cows again he was vaguely dissatisfied with the short range and the poor accuracy of his .30-30. The fact that the Springfield was an ungainly thing in a saddle scabbard was all that dissuaded him from possessing one. Not a hunter, essentially, but a workman who packed a rifle as a secondary tool, he went back to the old '94 lever gun simply because it fit under a saddle fender a little more handily.

Thus the stage was set fifty years ago for a gradual weaning of the western rider from his old "thutty-thutty" and the Single Action "hawg-leg" six-shooter.

During the 1920s two rifles appeared that had considerable influence on the man in the sagebrush. The first of these was the Winchester Model 54 bolt action highpower and the second was the Remington Model 30 bolt action rifle. Both guns were produced because of the influence of the Springfield and the Mauser rifles, military arms, and familiar to the cowboy because of the late war. I rode the Tex-Mex border for some years with an old cowpunch who had been reared on the Model 94 lever carbine. He would have no more of it. He packed a Model 54 in '06 caliber. By the same token his belt gun was the .45 Model 1917 Colt double action.

The U.S. Border Patrol, created in 1924, was filled with ex-cowboys. These buckos, like my partner Bill Duval, were all Model 94 shooters and knew only the old Colt .45. But fighting with the contrabandista persuaded them that neither the bunty little .30-30 nor the old single action was the right answer. The service issued the Colt M1917 in .45 ACP caliber and this was the popular choice. As for the rifle, the almost unanimous choice was the Winchester .351 automatic. The model known as the 1907. With a 10-shot magazine it was infinitely faster than the lever action in close-up fire fights. The Texas Rangers sometimes used the '07 too. Capt. Bill McDonald, he who was stated to have said, "One riot, one Ranger" carried the .351 on more than one occasion and used it to good effect!

As a Forest Ranger in northern New Mexico, I rode with Luis Lynch who was foreman for Emet Wirt, a big cattleman who ran his cows on my

ranger district. Lynch had seen a lot of gun action. He had been in the posse that ran down and captured Black Jack Ketchum. Ketchum was a bank and train robber and had a lively gang at his back. After his capture by Lynch he was tried and hanged. Lynch had been a deputy U.S. Marshal and a deputy sheriff across the length and breadth of the state. When I knew him he packed, of all things, a .38 S&W M&P six-shooter with 4-inch barrel. He habitually toted this little gun in a shoulder holster. He was never without it and even in his own quarters seldom laid it aside. It was the smallest caliber handgun I have ever seen on a practicing cowboy.

The introduction of the .357 magnum revolver by Doug Wesson in 1935 passed virtually unnoticed in the cow country. The fact that it was the



Texas Ranger Captain M.I. "Lone Wolf" Gonzales with S&W .44's.

most powerful handgun cartridge was news that did not penetrate the bunk house for many years afterward. The popular belt gun in those days, as it had been for sixty years before, was still the old Peacemaker.

The advent of World War II and the influx of virtually the whole cowboy population had a profound effect on the western bronc riders. They learned about automatic rifles for the first time; and the automatic pistol. After the shooting was all finished they came home and directly thereafter the influx of military surplus arms commenced. Convinced the automatic rifle and the self-acting pistol were both very much okay the cowboy at the same time was given a new interest in shooting irons. Heretofore he had been scarcely a hunter at all. The guns he packed were for self-defense, for protecting his livestock against coyotes, bears, wolves and rustlers. He rode by deer and ante-

lope, elk and other game before the war and scarcely thought of treating it as game. Now, with the war behind him and a brand new familiarity with firearms thoroughly imbued, he became a hunter. Not with the auto rifle he had used during the skirmishing but with the military surplus which was offered at attractive prices. Most of the rifles were bolt action but good guns for all that.

Cowboying changed too. Where before the cowman had worked his range from the hurricane deck of a bronc, he now rode his acres in a pickup truck. The horse was saved for roundup time. With the introduction of the light truck the cowboy found he could carry along the wartime bolt gun by the handy addition of a gun rack, affixed to the cab of the pickup behind his head.

Along with these changes the booming growth of the hunting scope-sight was not lost on our westerner. He became aware of the goodness of the new optical gadget and by this time an enthusiastic huntsman, he added the glass sight to his '98 Mauser.

On the side of the six-shooter the change was not so apparent. He became aware of the .357 Magnum and was converted to the double action revolver without many qualms. Despite his awareness of the dependability of the .45 auto he was not much wedded to the big automatic. It kicked too much and was hard to hit with; popularity among the clan was low indeed. Nor is any auto pistol given much play by these outdoorsmen.

The introduction of the .44 Magnum cartridge was a popular one with the modern cowpuncher. He instantly took to the big round and the S&W double action six-shooter and the Ruger single action became favorites in the caliber. The .41 Magnum has been ignored. But if you will glance into the cab of all the pickup trucks parked in a typical cowtown on Saturday afternoon in West Texas, you will find more .44 Magnum sixguns than any other.

The belt gun, like the rifle, is now consigned to the truck. The cowboy these days does not belt the revolver on as he used to forty years ago. He stuffs it in the seat beside him and there it rides, just as the rifle is racked up behind his head. Because he does not actually pack the handgun at his hip anymore he goes in for long barrels and adjustable sights; a gun he can hit well with in his new role of hunter-sportsman.

As an indication of the new trend, I recently made a big swing through the ranch country of West Texas. Traveling back roads and hitting the

little two-bit cowtowns, I talked to more than a score of ranchers and their cowhands. These laddy-os, to a man were traveling in the indubitable pickup truck and altho it was not hunting season every vehicle had a rifle swinging on the rack behind the driver. These were in the majority bolt action modern guns, all equipped

with scope sights and were rifles like the .243, the .270 and the .30'06. Not a single Model 94 .30-30 did I see. But there were three old Model '95 Winchesters, packed by as many old timers. As for six-shooters, I spotted only five altogether. These were all .44 Magnums, three of them the S&W Model 29 and the other two the Ruger .44 Super Blackhawk.



A & W DIVERTER

(Continued from page 25)

bore are made by reducing the inside diameter of the tube to physically constrict the shot charge, compressing it in much the same way as water going through a nozzle. Compressing the shot in this way reduces dispersion rates relative to the amount of choke reduction, and this creates variable density of shot patterns at given distances.

All objects given thrust or projected in some direction are subject to the Coriolis effect. This phenomenon relates to the apparent right-hand twist or turn in the Northern Hemisphere produced because of the Earth's rotation. It is responsible for cyclonic rotation in our low-pressure air masses, hurricanes and tornadoes, and the familiar "whirlpools" seen as water drains from a sink.

As a shot charge travels through the smooth-bore barrel, it responds to the Coriolis effect by rotating to the right. It will revolve about one turn in 58 inches at a velocity of 1000 ft. per sec. When this shot leaves the muzzle, the mass is rotating and this motion imparts a greater tangential angular velocity to pellets on the outside of the mass compared to those pellets nearer to the center. This incidental centrifugal velocity causes a faster dispersion rate of peripheral shot than would otherwise be the case. Pellets from the outside of the shot mass spread faster than the shot in the center of the mass, causing a heavier center density to the pattern and uneven distribution overall.

Also, with a regular choke bore, the shot mass is adversely affected by the aerodynamics of the sound barrier. Soon after it starts up the tube, the shot charge passes through the sound barrier and is going faster than Mach 1 as it leaves the muzzle. In a regular choke bored barrel, the shot charge acts like a single mass aerodynamically, rather than several hundred separate bodies. This mass of shot has a rather poor ballistic coefficient and soon slows down enough to come back through the sound barrier.

The standing or shock wave associ-

ated with trans-sonic and supersonic velocities (the "boom" we hear from aircraft) has considerable turbulence and energy. As the shot mass passes back through this barrier, pellets are jostled and scattered producing erratic or inconsistent pattern distribution.

The Diverter overcomes these disadvantages of the traditional choke bore. First of all, the ribs inside the cone section of the Diverter counteract the Coriolis effect, arresting rotation of the shot mass set up inside the barrel. This means that the same natural shot dispersion rates apply to all pellets in the mass without the influence of incidental tangent velocities.

Second, as the shot enters the oval-shaped cone section, hard propellant gases are allowed to speed around and ahead of the shot and expand into the shot mass. As the gases expand, they envelop and aerodynamically separate each pellet. Instead of the shot charge behaving like a solid mass, it is now "fluidized" and behaves more like a dense, heavy gas. Indeed, once the shot is fluidized, pellets do not hit each other or even touch the interior walls of the Diverter cone. Each separate shot pellet then obeys the physical laws governing its own flight independent of the other pellets; the solid mass of shot no longer exists.

Pellets by themselves are relatively efficient aerodynamically compared to the whole mass. There is no angular velocity to effect unnatural or irregular dispersion rates within the mass. Each individual pellet survives the ride back through the sonic barrier with little disturbance. Shot dispersion rates from the Diverter are more uniform and predictable than the averages produced from conventional choke bores.

Vector forces produced by the lateral expansion of gases (and, therefore, expansion of the fluidized shot charge) in the Diverter's oval cone conduct the shot into a horizontally expanded pattern. This initial characteristic spread of the shot carries on to the target. Inertia of the shot decreases the amount of horizontal

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spread; for instance, #6's spread faster than #2 pellets. Patterns will spread more both horizontally and vertically at a given distance with lighter shot.

This pattern size factor is the key to the use of the Diverter in the field. Ideally, the lighter the shot, the more spread there should be for an optimum pattern. The Diverter works quite well in this regard. In order to match loads to hunting situations, tests were run with pattern paper to determine how the two Diverter models distributed various sizes of shot at different ranges. The author was given assistance in the conduct of these tests by Sergeant Bill Felkner and Deputy Ralph Landmesser of the San Diego County Sheriff's Department. Information on the Diverter was needed as part of a training research for law enforcement applications. A summary of the test results is shown below:

PATTERN AND DISPERSION DATA

Buckshot	20 Yards	Model Two		
		30 Yards	40 Yards	50 Yards
00	24 x 14	35 x 19	51 x 39	53 x 41
1	26 x 10	34 x 19	50 x 32	55 x 46
4	19 x 17	30 x 29	48 x 39	75 x 48
BB	28 x 18	44 x 31	66 x 36	84 x 48
Shot				
2	24 x 15	38 x 30	51 x 34	63 x 47
4	28 x 20	43 x 32	53 x 40	71 x 46
6	29 x 20	43 x 31	60 x 39	
7 1/2	30 x 19	48 x 33	64 x 39	
9	48 x 24	64 x 43	82 x 48	
Slugs				3 3/4" C.C.

Buckshot		Model Four		
00	39 x 18	58 x 30	74 x 44	85 x 46
1	48 x 17	77 x 25	86 x 32	100 x 45
4	46 x 15	65 x 20	75 x 34	102 x 43
BB	52 x 16	78 x 36	102 x 46	
Shot				
2	60 x 14	77 x 31	107 x 48	
4	69 x 21	85 x 43		
Slugs				5 1/4" C.C.

Shot		Model Two (w/full choke)		
2			41 x 40	59 x 48
7 1/2		32 x 27	46 x 42	
Trap loads				
8		26 x 26	42 x 41	

*All loads tested were 12 ga. 3 3/4 dr 1 1/4 oz without shot cups, unless otherwise designated.

Two conclusions are readily apparent from the data. The Diverter really does spread the shot pattern on the horizontal axis. Also, pattern percentages in the conventional 30-inch circle will not realistically judge efficiency with the Diverter.

The measurements given in the table are the extremes that include virtually 100% of the shot in all patterns. Dimensions are given in the table that suggest rectangular pattern shapes. In

reality, patterns are blunt ellipses, similar to the oval shape of the mouth of the Diverter. Because of the Diverter's operating principle, there were very few erratic shot, or fliers, in any of the patterns. Round-for-round consistency was quite regular and predictable. Upper and lower fringes of patterns from most loads were rather marginal, however, for clean kills, and a more realistic picture of efficient pattern properties was in the area of 90% saturation.

To determine the nominal size of the 90% distribution pattern size for #2 and smaller shot, the above data can be adjusted by reducing the horizontal dimension by 15% and the vertical dimension by 30%. Thus, a charge of #7 1/2 shot fired from 30 yards with a Model Two Diverter shows 100% distribution in a 48-inch by 33-inch area. Adjusted, the 90% nominal dimension would be 41" x 23"

to the nearest inch. The 90% dimensions produced consistent killing patterns for nearly any kind of game birds. In addition, upland loads of #7 1/2 and #9 shot showed better than average killing density in the traditional 30-inch circle centered on the pattern at 30 yards.

The size of Diverter patterns may be deceptive when compared to the usual 30-inch circle. The relative density of pellets within the impact area

is important. Too high a density can result in mutilated game, while relatively low density will not bring down some kinds of birds cleanly or consistently.

The following table shows comparative arithmetic pellet distribution based on nominal data from conventional chokes and test data derived from the author's research.

COMPARATIVE PELLET DENSITIES*

12 Gauge loads—1¼ oz. shot

Size	Quantity	30 inch circle			Diverter (90%)		
		90%	70%	50%	20yd	30yd	40yd
#9	731	.931	.724	.516	.944	.406	.276
#7½	437	.504	.431	.308	1.053	.375	.244
#6	281	.356	.277	.198	.720	.340	.183
#4	169	.216	.168	.120	.455	.188	.121
#2	113	.144	.112	.079	.464	.152	.098

*The decimal figures show the average number of pellets per square inch of impact area. The factor is determined by dividing the number of pellets by the area of the impact zone. This does not indicate the true or random effect, which depends on the regularity of particular barrels and their ability to distribute shot evenly.

Time will not permit an examination of this data with regard to the technicalities of how many shot of what size it takes to tag certain game birds at a given range. However, the table does show that the Diverter alone has no particular advantages over regular chokes so far as extended range is concerned for upland hunting when shooting standard shot sizes.

Within expected ranges, however, the Model Two Diverter is quite versatile for the different kinds of shooting that are possible with the one device. Such versatility cannot be attained using a single modified choke barrel. The effective area of the shot pattern is much larger than that of the conventional choke, and distributions are much more even and predictable.

The Diverter produces a wide and variable range of shot pattern dimensions and densities according to the sizes of shot used in the loads. The Model Two is adaptable to many shooting applications merely by selecting the proper shot sizes and loads suitable to a particular kind of game.

The quality of patterns is more important than linear dimensions in analyzing Diverter performance. The regularity of pellet distribution is most important. Heavier shot (e.g., #2's or #4's) showed exceptional regularity in density at all test ranges. As shot sizes got smaller, erratic performance showed up at about 25 to 30 yards in the form of holes in the pattern. These holes were not serious, though, since most upland game, the usual targets for

#8 or #9 shot, are generally taken at under 30 yards.

Number 9 shot in skeet loads had some peripheral pattern separations at 30 yards where quail or clay birds could get through. The central belt, measuring about 50% of the extreme vertical dimension, was quite efficient, however.

Shooters will probably find that

using the heavier shot sizes recommended for upland game will give the best results. For instance, 7½ shot produced much more even distribution and better balanced patterns than #9's. There were more than adequate numbers of 7½ shot per square inch to bring down small upland birds such as valley quail or bob white out to 30 yards.

Check loads made up with lighter shot charges than the 1¼ ounce test loads showed about the same nominal pattern spreads for any given shot size. While heavier dram equivalents tended to spread patterns more, there did not seem to be any effect on pattern size due to the amount of shot. Obviously, as shot charges are cut in weight, density goes down. This can be compensated for by using the next smallest shot size. In this context, 1 oz. of #8's will be about as effective as 1½ ounces of #7½'s. By proper choice of shot size, charge weight, and dram equivalencies the shotgunner can adjust his loads to the expected needs. Some choice of reloading components might be indicated. However, no significant changes were noted in shooting plain loads as compared to shells loaded with plastic wads and shot cups.

The waterfowler may find the greatest advantage from using the Diverter. The Model Two handles heavy shot (BB's, 2's, 4's) exceptionally well. Also, for shooting over decoys, #5's patterned quite well in separate tests. (Data was not included in the table above.)

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ducks and geese pose a particular problem for the waterfowler. This kind of shooting is ideal for the horizontal pattern dispersion of the Diverter. The short shot-string and horizontal dispersion provides a much more effective "time-space" zone through which the bird has to fly. Hit probabilities at extended ranges are significantly higher than with conventional choke bores. Because of the horizontal dispersion of shot, the Diverter should put another 5-10 yards of effective range on duck and goose loads for most gunners.

An interesting thing happens as buckshot gets farther from the muzzle of the Diverter. The apparent rate of marginal dispersion slows. Past 50 yards, heavier shot such as BB's or #4 Buckshot continues on very nearly parallel trajectories. Many experienced shooters will be able to develop long-range waterfowling techniques using heavy shot and the Model Two Diverter mounted on a full-choke barrel.

The combination of regular chokes with the Diverter has an interesting

show any appreciable advantage over a tight modified choke at 16 yards. There may be some advantage for the handicapper who wants to raise his scores. Ideal patterns put 90% of the shot in a 30-inch circle at 40 yards; 96% was in a 36-inch by 23-inch oval. Performance like this means powdered birds from 21 yards.

For skeet, the potential of the test gun was reduced considerably by the fact that the pattern printed 16 inches low at 20 yards with a normal hold. Otherwise, the horizontal spread has considerable potential for this sport. Regardless of the application, the Diverter provides a different concept in smooth-bore shooting. Adequate patterning exercises are necessary to show the shooter just how his gun will perform. Without this knowledge, many users may be disappointed after the first trial.

Muzzle devices tend to make shotguns shoot low because they elevate the front sight. The bead on the Diverter is from 1/8 inch to 3/16 inch higher than normal. This factor has to be compensated for by raising the



Sgt. Bill Felkner and Deputy Landmesser of San Diego County Sheriff's Dept. helped the author in testing.

set of possibilities. Patterns are more nearly round since the diameter of the shot mass is smaller as it enters the Diverter cone through the full choke. Because the shot fits looser into the cone, it is less affected by spreading vector forces.

This effect reduces the relative horizontal spread and also reduces the absolute amount of pattern spread at longer ranges. In separate tests conducted with the Model Two Diverter mounted on a 30-inch full choke tube, #4 Buckshot was registering efficient goose patterns out to 75 yards. This data suggests future load research. Not every waterfowler will be able to take advantage of this performance, but it could be challenging to give it a try, particularly in conjunction with the development of high-velocity loadings in shotshells.

In shooting trap with this long full choke barrel, the Diverter did not

showing eye relative to the bead. The correction may be unnatural to accomplish with a regular field or skeet stock. The situation can be corrected usually by mounting a trap stock on your field gun. The higher comb of the trap stock places the shooting eye higher and raises the impact center of the pattern. In addition, the straighter stock is more comfortable to shoot.

If a vent-rib is used, it is best to have a mid-rib bead for gauging proper gun-to-target alignment. Many shooters think the mid-rib bead is to be superimposed on the front bead much like rifle sights. This practice will result in the gun shooting low.

The mid-rib bead should be placed below the front bead so the picture looks like a figure "8". In most cases, when this alignment is made, the shotgun should shoot where it looks.

Presently, the Diverter comes with

a brass bead sight. A Bradley-type bead would be preferable in either white, red, or gold depending on the shooter's needs. The use of a vent-rib and mid-rib bead with the Diverter is highly recommended for best field performance.

There are a few miscellaneous items related to Diverter performance that will interest shotgunners. For the slug shooter, performance is really exceptional. The Model Two Diverter printed three round groups from the bench averaging $3\frac{3}{4}$ inches center-to-center at 50 yards. This is compared to $5\frac{1}{4}$ inches for the Model Four Diverter under the same conditions. Sights were the standard front bead only. This compares favorably to four inch groups shot at 50 yards from a special 20-inch slug barrel using open rifle sights.

Instrumented tests measuring sound decibels showed that the Diverter does not increase muzzle noise compared with a regular barrel. Other vented muzzle brakes and chokes tend to raise muzzle noise level substantially. The Diverter vents gases in practically the same way as an unobstructed muzzle. In fact, venting of gases is so efficient, that at the time that the shot charge leaves the Diverter cone, the terminal flow has no pressure gradient, just forward velocity. This fact also contributes to pattern uniformity and a significant reduction in recoil effect.

Velocity checks proved A&W's claim to a 5% increase in velocity from using the Diverter. There obviously has to be a feature in the

Diverter design that increases ballistic efficiency. High-speed cameras have discovered a slight hesitation in the shot charge as it makes the transition from muzzle to the Diverter cone.

Since gases flow at up to 30 times the velocity of the projectile, hesitation of the shot charge causes flow compression of the propellant gases just behind the wad. This compression means greater localized pressure (up to 23,000 transient psi actually measured) and more heat; greater heat means more BTU's and increased energy, enough to raise velocity by 5% over normal expected levels.

Using a Diverter will change some of the old concepts of wing shooting. These changes may frustrate some shooters and stimulate others. The advantages the Diverter now possesses makes it especially attractive for long-range pass shooting at waterfowl when mounted in combination with a conventional choke. Research and development is proceeding at A&W to produce a more flexible pattern control device using the Diverter principle. It seems more than likely that the Diverter, or an adaptation of it, might change future shotgunning in much the same way as did the choke bore a century ago.

Either model Diverter sells for \$28.75 plus a factory installation fee of \$5.75. Presently, Diverter are available in 12 gauge only. For information, contact the A & W Engineering, Inc., 6520 Rampart St., P.O. Box 22084 Houston, Tex. (77027)

RUGER CONVERTIBLE

(Continued from page 20)

what surprised when one group could be covered by a half-dollar. I timed the Winchester 9mm rounds at 1080 fps.

The 9mm Remington 124 gr. bullets circled in 3" groups, with some wide three-shot groups of $4\frac{1}{2}$ inches. The Remington slugs moved out at 1025 fps.

My conclusion from these velocities is that the 9mm loss at the cylinder gap of a revolver, which is not experienced when fired thru the closed breech of a semi-auto, is more than made up by the extra length of the Ruger barrel.

Since Super Vel groups were tighter, I went back to testing more of this round. In examining the earlier groupings, I was printing $1\frac{1}{2}$ " low with my best groups. Therefore,

I adjusted my Handgunner Scope accordingly and fired from sandbag rest. I was still low. The Handgunner is a bit difficult to adjust in raising elevation. Since I tend to shoot low, I would like to see the elevation adjustment on the Handgunner improved upon. After some efforts, my groups moved up upon the bullseye, keeping 2" groups on the average. My wildest strayed to $3\frac{1}{2}$ inches, while my tightest six-shot group printed at $1\frac{1}{4}$ inches. Two three-shot groups, made one $\frac{3}{4}$ " hole. Here, then, were the results of the superb trajectory of the 9mm Super Vel being fired at 50 yards thru the barrel of the Blackhawk Convertible when sighted-in thru the bright and clear Handgunner Scope . . . on a windless day . . . by one who makes no claims at

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being a target man.

Feeling my oats, I paced off 100 yards, changed cylinders, set two beer cans and a Pall Mall pack on a hill. I loaded the Ruger with six rounds of the new 137 gr. .357 Super Vel SP. At bench rest I kicked up dirt a foot below the cans. I compensated via the crosshairs. I put a bullet thru each can on the last two shots. Loading up again, I managed to hit the pack of Pall Mall, which looked like a dime at that distance, on the fifth shot. This was the best shooting I had done in a long time.

For the handloads, I selected those of proven merit since I wished to concentrate more upon testing the .357/9mm Ruger than upon experimentation with various powder/bullet weight combos. I chose the favorite 9mm handloads of a few other gun writers. Namely: the 116 gr. Norma hollow-point with 6.0 grs. of Unique; the Speer 125 gr. soft point in front of 6.5 grs. of Herco; 6.0 grs. of Unique with IBAC's 120 gr. DD bullets. Then my favorite, the 108 gr. Super Vel soft point backed by 7.0 grs. of Herco. I used both CCI and Super Vel primers.

Still shooting with the scope, the Norma 116 gr. kept 2½" groups, while the Speer 125 gr. produced 3" groups. The IBAC 120 gr. dummdums went 2½-3 inches, with a couple groupings of 2 inches. The 108 gr. Super Vel stayed under 2 inches usually, opening to 3 inches occasionally, while pinpointing a couple of 1½" groups.

The day's averages showed that Super Vel, commercial or handloads, kept the tightest consistent groupings. I noted that the hot Super Vel handloads clocked slightly slower than the factory loaded Super Vels. Lee explains that his factory loads are faster since he is able to keep closer control at the factory via instruments than is possible for even the advanced handloader.

The opinion has been expressed that a .357/.38 Special barrel would be too large for the smaller 9mm Luger round, claiming, specifically, that the .357 barrel is .002 too large for the .355 9mm bullet. Obviously they subtract .355 from .357 in arriving at this disparagement of .002 inches. But their arithmetic is incorrect with regard to their conclusions.

To begin with, let's cite the exact bore/groove measurements of the Blackhawk Convertibles. The bore diameter of all the .357 Blackhawks is .3500 min. to .3515 max. The groove diameter min. is .3570 (hence the name 357) and max is .3585.

Now let's cite the ammunition man-

ufacturers' industry specifications for 9mm. The 9mm pressure barrel is .348 bore and .358 groove.

Comparing the Ruger's barrel with the 9mm test barrel, we find the Blackhawk's bore looser with the grooves tighter. Being that the Blackhawk's barrel has 8 grooves instead of the standard 6 grooves, makes the squeeze just about perfect.

Understand that the industry standards for the bite of a revolver bullet is .003 to .005 more than for a semi-auto bullet. These standards were figured years back on the theory that hardball should not be squeezed thru as tight a barrel as soft, lead revolver bullets. This means that a .38 Special lead bullet of a .359 diameter has reached its limit in diameter size when fired thru .38 or .357 barrels with .357 diameter grooves. Simply: soft revolver bullets should never go over .002 of the groove diameter as accuracy suffers, not to mention leading becoming excessive; hard auto bullets with jackets should be the same size as the groove diameter it is being fired thru. In either case, accuracy can be improved if the bullet's diameter is exactly .001 over the groove diameter, *theoretically*.

From a *practical* standpoint it is optimum for semi-auto slugs to be slightly *under* groove diameter, or at least for the bullets to be the same diameters as the groove diameters of the barrels they are fired from. The ballgame, y'see, isn't centered upon these diameter measurements so much as it is upon the amount of bite being taken by the grooves. Generally speaking, revolver bullets bite .010 into the grooves while pistol bullets bite .007 into the grooves.

Why do you think James Bond was known as Agent .007??? That's right, because his .380 PPK took a .007 bite of the bloody bullet! Ian Fleming, who was a gun buff of sorts, subtracted the bore diameter of the PPK (.349) from the groove and .380 bullet diameter (.356), figuring the bullet bit into the groove .007 of an inch. Therefore, Agent .007.

As it works out with the Blackhawk Convertible, the 9mm bullet of .355 diameter bites into the Blackhawk's grooves to the tune of from .0035 to .0050 inches. Which is plenty enough. In fact, it is ideal, being the secret of high velocities (which in turn is the secret of high ft. lb. energies and accuracy) is to have the slug slightly under groove diameter. To some extent this is the secret of the phenomenal success of Super Vel. Most of the Super Vel semi-auto bullets are under respective groove diameters from .0005 to about .0025.

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(The Super Vel 9mm, however, is .355.) Breech pressures are also reduced by having the bullet slightly smaller than the groove diameter.

Suffice to say: there is nothing valid in the thinking that the 9mm round is .002 too small for the .357 bore of the Blackhawk Convertible. I have tested this Convertible against the Astra 600, the Vis (Radom), and the P-38. The Blackhawk kept tighter groups than these guns designed solely for the 9mm round. The 9mm Luger slug fires with greater accuracy thru the Ruger, than thru the Luger for which it was designed.

I have suggested that the Blackhawk Convertible could be made even more convertible if another extra cylinder were made. A .38 Super Auto cylinder could be made to accommodate this Blackhawk because it's semi-rimmed. The idea is to make the Convertible not only compatible with the 9mm round, but also with the .38 Super. This would certainly widen the horizon for the Blackhawk Convertible as a 'companion piece' and/or 'combination gun' for those buffs with a yen for a sixshooter that will fire the same ammo as their .38 Super pistols. And, more and more buffs are discovering it and prefer it.

E. P. Nolan, Vice President of Marketing at Sturm, Ruger, tells me that their approach "... could possibly be a new cylinder, properly chambered for the .38 Super Auto cartridge, if the market warranted it." Lee Jurras tells me he is now producing the .38 Super because of the large demands for this round. Therefore it would seem that a .38 Super cylinder for the Blackhawk Convertible might be in the making. The concept is not to duplicate ballistics. The idea is to make an extra cylinder so that the gun can use the ammo of those who have .38 Super pistols.

Mechanically, the .357/9mm Convertible Blackhawk is the same as the .357 Blackhawk, except that it accommodates the extra 9mm cylinder. (The .357 Blackhawks can be sent back to the factory to be fitted with the 9mm cylinder for \$16.) Two barrel lengths are offered for this model, 4 7/8" or 6 1/2". The .357 models,

standard or Convertible, have barrels with 8-groove rifling, 16" twist. All other Ruger handguns have 6 grooves. They use 8-groove rifling in the .357 because they figure they can properly use button-rifling and get a smoother bore and grooves. Also, button rifling seemed to help reduce leading in the tests they ran.

As with the other Ruger revolvers, this Convertible uses Nylok anti-vibration screw-locks. Its springs are made of coiled music wire. Like the rest of Ruger's large caliber guns, it has an adjustable rear sight. The cylinders line up precisely. I noticed no offcenter bullet shaving, even when using 200 gr. lead .38 Special.

I fired 500 rounds of .357s thru the Blackhawk Convertible, and a few of the screws loosened slightly. I found that the only way to sight a gun is to fire 200-500 rounds, then tighten the screws and sight it in. Then the gun is ready for some serious target work.

The 'blue pills' used to test the breech of the Blackhawks are close to 55,000 psi. The hottest commercial and published handloads for any of its calibers would never exceed 35,000 psi, therefore there is a wide safety margin inherent in this weapon. (I trust that there are no idiots who would ride into the safety margin and push loads over 35,000 psi.)

I believe the success of Mr. Ruger's handguns is to be found in his system of manufacture. Ruger has perfected the investment casting process, whereby the investment castings are stronger than similar forgings. The cast one piece frame is a better and less costly way to fashion the frame than with the old method of milling the front and rear straps. But the real secret of making top-quality sixshooters at a reasonable price is to be found in the fact that the .357 Blackhawks have 34 parts that are interchangeable with the other caliber SA revolvers Ruger manufactures. These manufacturing shortcuts and simplifications are the ways to precision in production. This, and the fact that the very best materials are used, such as chrome molybdenum for the cylinder frame, are the reasons for the great success of Bill Ruger's handguns.



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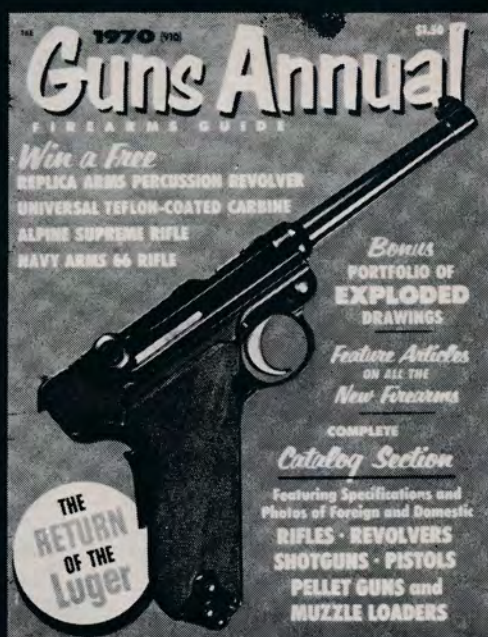
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G-5

Robert Abels, Inc.	12
American Firearms Mfg. Co., Inc.	59
Anderson & Company	72
Austin Boot Company	69
Bachmann Bros., Inc.	78
Bandy Products	48
Barney's Cannons, Inc.	72
Batjak Company	16
M. G. Bauer Company	50
E. C. Bishop & Son, Inc.	58
Bo Mar Tool & Mfg. Co.	66
Marvin Bonder	66
Boot Hill Enterprises, Inc.	13
Nelson Brand	16
Eldon Brandt & Son	48
Buck Knives	14
Carbide Die & Mfg. Company	48
Cathey Enterprises	72
Centennial Arms Corp.	58
Century Arms, Inc.	59
Challenger Mfg. Company	53
Cloyce's Gun Stocks	75
R. J. Coffey	48
Coladonato Brothers	75
Dart Metal Detector	3
Dixie Gun Works	51
Double M Company	72
Doubleday & Company	Cover 3
Edward's Recoil Reducers	53
Jerry M. Evans	68
Reinhart Fajen	75
Fall Sales Company	68
Flayderman & Company, Inc.	6
Freeland's Scope Stands, Inc.	6
Garrett Electronics	17
General Sporting Goods (Norma Precision Div.)	13
Golden Age Arms Co., Inc.	50
Gun-Mo Sports Cases & Equip.	47
Herters, Inc.	51
Hoosier Machine Products Co.	50
Hornady Mfg. Co.	69
Don Hume Leathergoods	59
Hunting Hawks	56
Institute of Applied Science	13
Jer-Aer Corp.	50, 57, 59, 66, 68, 75, 78
George Lawrence Co.	51
Leisure Group/Lyman	9
Len Company	56
Leupold & Stevens, Inc.	67
Lytle Novelty Company	78
Military Miniature Reproductions	72
Frank Mittermeier	55
Modern Gun Repair School	13
The Museum of Historical Arms	68
S. D. Myres Saddle Company	6
National Rifle Association	7
Normount Armament Co.	56
Outers Laboratories, Inc.	58
Pachmayr Gun Works, Inc.	78
Panther Knife	48
Pendleton Gun Shop	75
Protecto Plastics, Inc.	55
Pyro Plastics	48
RCBS, Inc.	8
Radiator Specialty Co.	68
Redfield Gunsight Company	Cover 2
Reforestation, Inc.	55
Relco Industries	66
Remington Arms Co., Inc.	12
Russell's Arkansas Oilstones	53
S & K Mfg. Company	56
Savage Arms	44-45
Shotgun News	57
Sigma Engineering Company	12
Smith & Wesson, Inc.	70, 71
Sports, Inc.	66
Sterling Arms Ltd.	47
Texas Rangers Historical Arms, Inc.	49
Triangle Dist. Company, Inc.	68
Triple K Mfg. Company	53
Turn-O-Carve Tool Company	68
Melvin Tyler	16
Viking Knives	50
W. R. Weaver Company	11
Whitney Sales	65
Winchester Press	65
Winchester Western	Cover 4
Wolf Specialty Company	48

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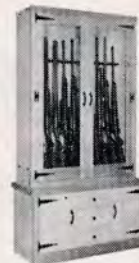
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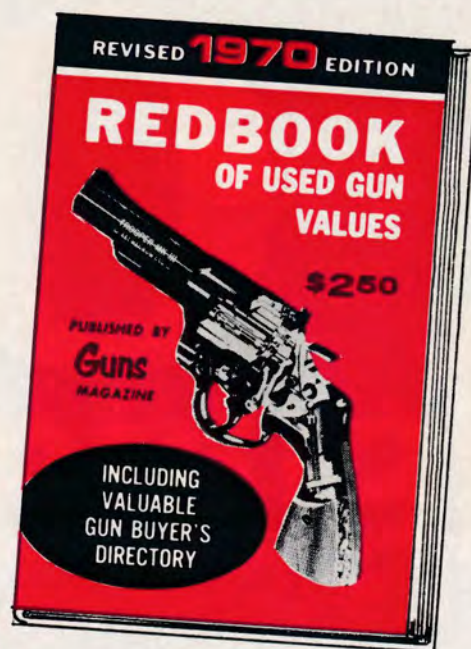
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