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50 CENTS

MARCH-APRIL, 1965

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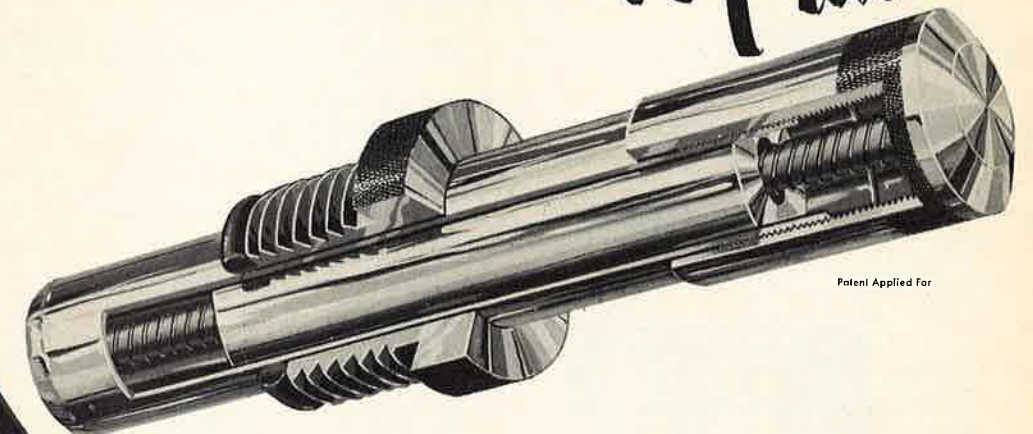
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BOW & ARROW

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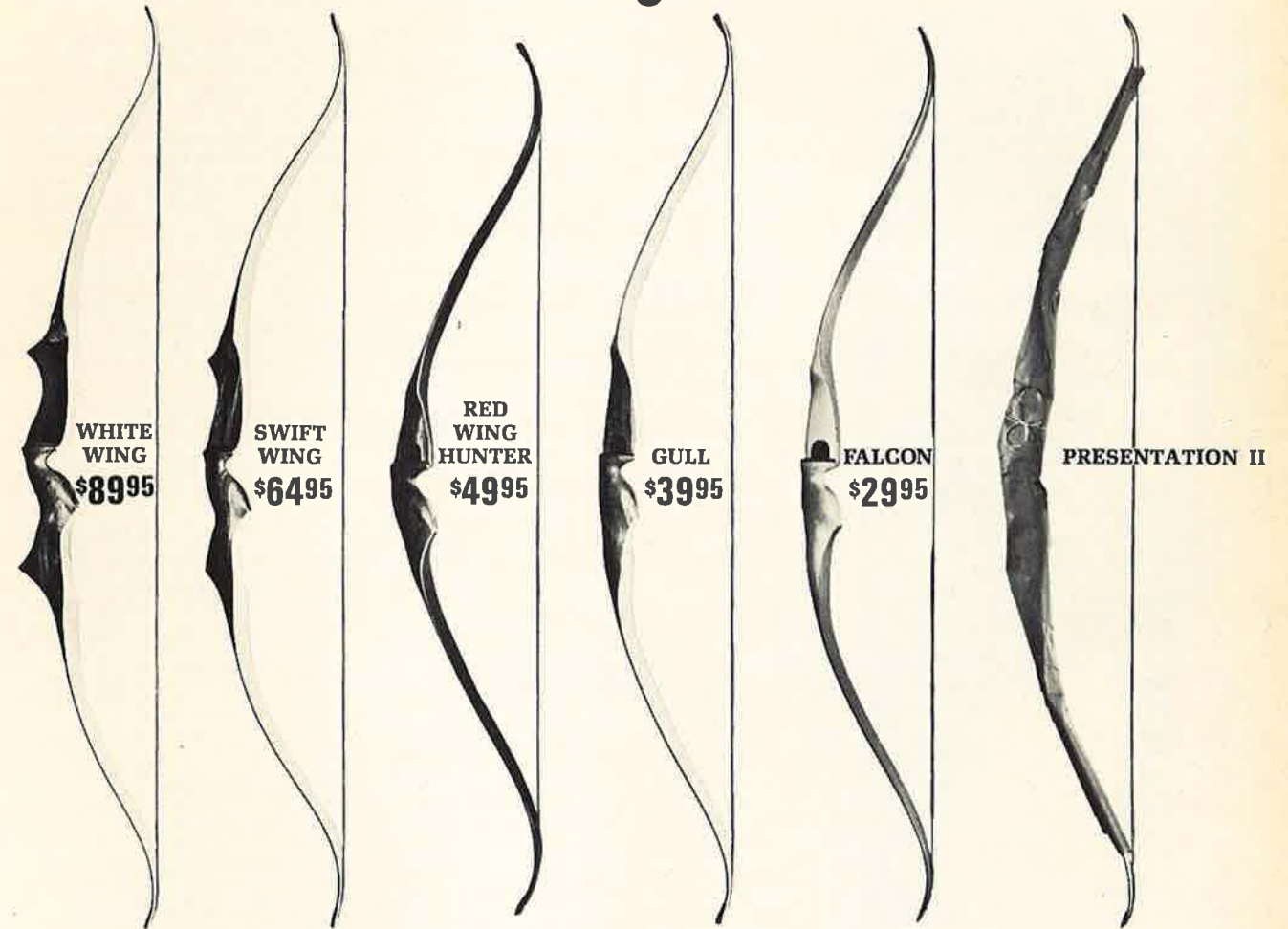
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ON THE COVER: Although deer season is several months ahead, this photograph is bound to give you a tingle in the vicinity of the spine and make you start checking your broadheads for sharpness. The shot was taken last fall in New Hampshire. Photo by Ozzie Sweet.

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5 FABULOUS NEW WING BOWS (and a top-level secret) FOR 1965



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TRY THIS

Enjoy your magazine a great deal and consider it a great force to enhance the standing of archery as a sport.

Re a letter in the *Tech Talk* column of Nov-Dec. 64 from G. Marshall of Winnipeg, Manitoba, there is a simple device known as a "klicker" that will cure his problem quickly. They sell for less than \$2 at any tackle shop.

I borrowed one for a day and beat a terrible case of "target panic." This whole subject is dealt with at some length in the book, *Power Archery* by Dave Keaggy, Sr. I would hate to see someone quit the sport for this reason.

Ron Leonard,
Willowdale, Ont., Canada

ARCHER RETURNS

I bought your Nov-Dec. issue at the corner drugstore and read it from cover to cover and enjoyed it immensely.

I have dabbled in archery for a number of years, but have been lax about it for the past two or three. My son is shooting and has re-aroused my interest in the sport, so I am again becoming engrossed. Your publication is top notch and offers many good tips for novice and accomplished, as well. Anticipating your next issue.

Bob Kennelly,
Pittsburgh, Pennsylvania

(Archers, we're told, are like alcoholics. One arrow is too many and a million isn't enough!)

THEY DON'T LAUGH NOW

In regard to Lee Woodruff's letter in the Nov-Dec. 64 issue, I was out hunting and some young folks drove by and started laughing at sight of me with bow and quiver, yelling, "Hey, chief!"

At that point, a jackrabbit jumped up about forty yards from me and my first arrow dropped him. There was no more laughter. They were as surprised as I was.

Ray Vondracek,
Omaha, Nebraska

FROM VIETNAM

I am an avid follower of your magazine and even get it over here in Vietnam. I would like to congratulate you on the article about the new bows for 1965.

We have hopes of forming an archery club up here in the near future.

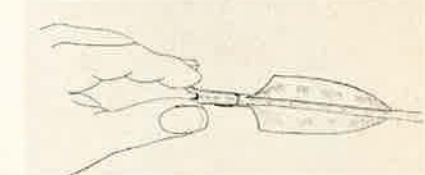
PFC Walt Kruteson,
U.S. Forces,
Republic of Vietnam

(Well, we do get around, don't we?)

HERE'S A GIMMICK

On those cold mornings, when setting out on a deer stand or walking to it, that left forefinger can get mighty cold holding that arrow in place on the bow.

A good solution is to dip the arrow nock in hot water and pinch



it slightly shut as depicted in the illustration. This keeps the arrow in place on the string and allows that finger to join the others for warmth. It beats climbing down out of the tree to pick up that favorite arrow when you drop it.

You needn't worry about this changing your shooting accuracy or the killing power of your arrow. Pick out an old arrow and try it!

R. C. Swanke,
Jewell, Iowa

HYP0-ARROW

Sometime ago, I read an article about "hypodermic arrows" in one of the other sporting magazines. However, I can't find these now and would like information on the arrowheads, or needles. Where may I purchase some of these heads? What is the approximate cost? Are they as effective as they are said to be?

I would greatly appreciate information regarding this subject, and would like to see an article about it in BOW & ARROW.

Johnny W. Brock,
Graham, Texas

(Your wish is our command, even if we had scheduled the article in this issue before receiving this letter. The needs for the hypo-arrow are manufactured by the Palmer Chemical and Equipment Company of Douglasville, Georgia, but you had better check your state bow-hunting regulations to determine whether they are legal to use.)

(Continued on page 44)

Terrific Trio . . . from USAC!

Here are three masterpieces of the bowmaker's art, supremely accurate bows reflecting all the care and precision which have gone into their design and manufacture. All three give you velvet smooth draw, unsurpassed strength, comfort and speed.

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Sight Window—6" Fist Mele—7" to 8"
(Add 10% for weights over 60 lbs.)

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Sight Window—7½" Fist Mele—6½" to 7½"
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(C) NEW YORKER

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Sight Window—7½" Fist Mele—7" to 8"
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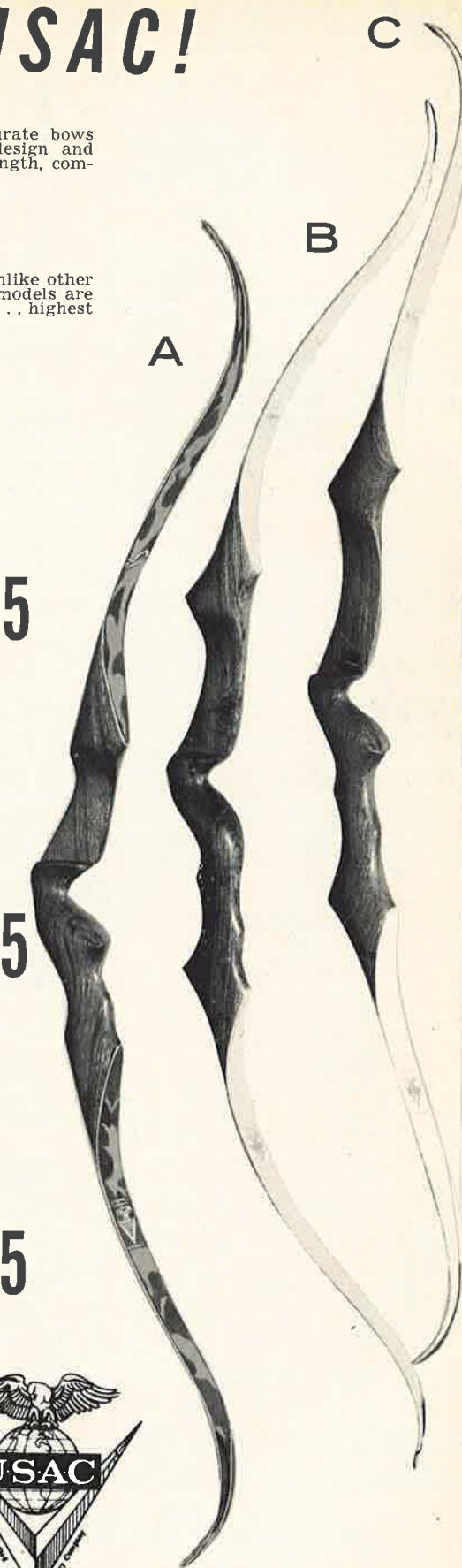
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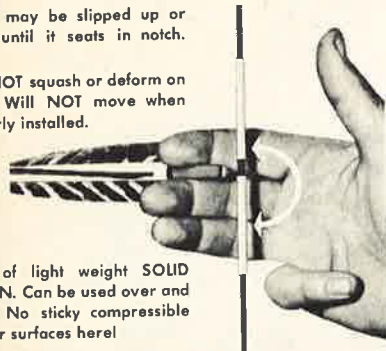
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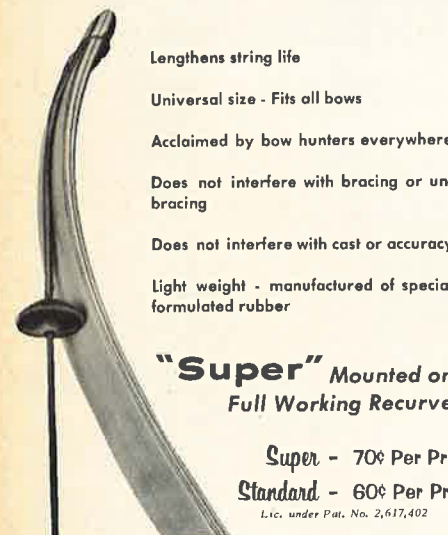
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TECH TALK

QUESTIONS & ANSWERS

WHICH EYE TO USE?

Would you please explain the proper use of the sight? I have been practicing and getting a fairly good group, but hit to the left of the target. I have my sight moved out about 1½ inches, but other sight shooters I know only have their sight out about half this amount. Could it be that I am not aligning the string exactly with the sight? Or perhaps I am aligning the right or left side of the string with the sight.

Rudy Janousek,
Posen, Illinois

(It sounds as though you may be looking out of your left rather than your right eye, which is over the arrow. Try closing your left eye to see if this doesn't bring your arrow back to the right of where it has been hitting.)

(You fail to mention whether your arrows appear to be shooting straight out of the bow without wobble, or if they fishtail a little. An arrow which does not leave the bow properly can wind up to the left of where it should hit, and can be caused by incorrect nocking (too low), or your arrow rest not being set up correctly so the arrow presses on the bottom directly where it presses on the side of the bow.)

HERE'S THE SYSTEM

Three months ago, I purchased a Ben Pearson Javelina bow, measuring sixty-six inches with a fifty-pound draw at twenty-eight inches. This is my first bow and I can handle it very well.

My problem is that, if I use the under-chin anchor which I prefer, I can only get a twenty-seven-inch draw, so I made an arrow in that length and found I was right. I would like to know how to buy arrows to match my bow for a twenty-seven-inch draw, when the original specifications read fifty pounds at twenty-eight.

Bernie Dehart,
McCarr, Kentucky

(You should figure on your bow losing about 2½ pounds for each inch less than twenty-eight inches

that you draw. Thus your fifty-pound bow will pull about 47½ pounds at twenty-seven. Order your arrows and shafts by stating you want them matched for forty-eight pounds at twenty-seven inches. The supplier then will select the best spine for your needs.)

HUNTER'S REST

I am interested in archery and have purchased a new bow. I plan to use it for hunting and would like to know what type of arrow rest you recommend? What type do most hunters use?

Les Meigum,
Mobridge, South Dakota

(Most experienced bowhunters prefer a feather rest made with four or five feathers glued in an upright position and trimmed to a parabolic shape. These are available from most archery suppliers at a cost of fifty cents or so.

(This type of rest effectively dampens arrow noise, and being flexible, helps correct arrow flight when a bad release is made. We recommend that you apply a bit of feather waterproofing to the rest so rain will not harm it.)

THAT QUESTION, AGAIN!

How many times have you read in many of the bowhunting stories, "I'm just not a good enough archer to shoot the short recurve or modern hunting and target bows"?

Some of these bowhunters use the long bow or possibly a slight recurve bow. Now comes the loaded question: Will a bow of the latter type perform better for a hunter when he is under pressure, shooting at game? Will it minimize a slight mistake of the bow arm or release hand rather than magnify it as the recurve might possibly do? Please note that I am not concerned with ease of handling or speed; just control.

Harry C. Smith,
Manheim, Pennsylvania

(Doug Kittredge, who has long studied this question, reports: "Why not look at the record? At least eighty percent of all bows sold to adults are sold for bowhunting. With several thousand deer shot with bow and arrow each year, plus a great number of other big game and much small game, there have to be quite a few experienced bowhunters in the field.

("In recent years, at least four firms have come into the market with a long bow. All of these firms either are out of business or have discontinued this bow design.

("Obviously, if such a design (Continued on page 56)

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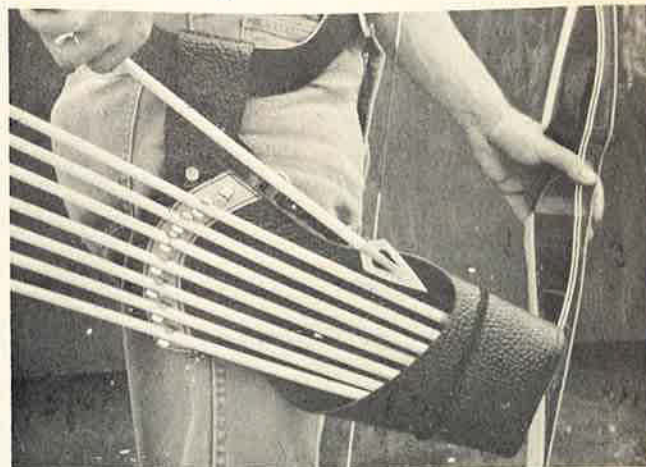
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HUNTING WITH Doug Kittredge



"Keep Your Broadheads Sharp!" read all the ads and literature on bowhunting. Just about every archer who has done any hunting knows this number one rule of the hunting field, and the majority of bowhunters follow it to a degree in keeping with their understanding of how an arrow kills. The difficulty is . . . How sharp is sharp?

With the exception of the use of a blunt on small game, or a spine or head shot on big game, an arrow kills by hemorrhage . . . the bleeding of an animal until he collapses and dies. Unless a vital organ such as lungs, heart or liver is hit, the blood flow must be great enough to prevent the blood from coagulating and the wound healing.

The sharpness of the broadhead does not govern penetration as much as it controls the cutting damage of the animal tissue through which it passes. The very point of the broadhead must be needle sharp. This is the part which does the guiding through the meat, particularly through bone. A dull point on your broadhead can cause the arrow to deflect and glance off of even a thin rib bone.

The edges of the broadhead, particularly the last one third of the blade, do the cutting and cause the bleeding. Imagine that you have a freshly sharpened wood pencil gripped in your right hand. You hold your left hand with palm up and stab the pencil completely through your hand. The resulting wound would indeed be painful. There would be a certain degree of blood, but it soon would coagulate and stop. The pencil had forced a hole in your hand, not by cutting tissue, but by wedging and tearing the tissue apart.

Now imagine the same experiment using a finely sharpened pen knife. Sharpen the back of the blade as well as the front, both to a razor keenness. Now, stabbing your hand with an instrument no larger than the pencil, produces an entirely different result. You have cut, not wedged the tissue open. Blood flows freely and the wound does not coagulate . . . in fact, if you don't get some medical attention soon, you'll shortly become a statistic.

This is the killing power of the hunting arrow. You must have a broadhead which will cut, not wedge apart the meat and tissue. Furthermore, the cutting edge must cut easily, as animal tissue is flexible and soft. If it requires pressure for your broadhead to cut, it will actually spread apart the tissue as it penetrates the animal, rather than producing a cut. There is no cutting edge like a razor blade! Such an edge is the goal to try and achieve as you sharpen your hunting heads.

The major difficulty is that the steel used in the majority of broadheads is too soft to hold the razor edge while the arrow penetrates thick hide, hair and bone, with the result that by the time it finally reaches the actual meat, the broadhead is no longer sharp enough to really do the job. Take an ordinary file and try making a mark on a real razor blade, then try the same thing on your favorite broadhead . . . the difference in hardness is immediately apparent. A growing number of bowhunters are gluing pieces of razor blade to their broadheads using Plio Bond cement and producing a superior killing head. It takes time to do, but the fact that a wound in almost any portion of the animal results in death, makes this time well spent.

Remember the last time you nicked yourself shaving? Recall how difficult it was to stem the flow of blood? Just imagine the result when an actual razor blade on a broadhead strikes an animal . . . even if only grazing him and not even hitting a major organ or artery. Not having a medical center to which to go, the animal has no way of stopping the blood and soon succumbs to death.

It has been determined that approximately eight percent of a deer's weight is blood. With a pint of blood weighing about one pound, an average one hundred-pound deer has some eight pints of blood in his system. The loss of a shade over one-third of the body's blood will cause his collapse and shortly after his death. In the case of this one hundred-pound deer, it will require almost three pints of blood to flow from his body before you can claim your trophy.

Three pints of blood is a lot! When spread on the ground as a blood trail, it is an enormous amount. To get an idea, try filling a quart milk bottle full of water. Go out in the street and splash the water about as you normally would

find a blood trail . . . a thin trickle here for a ways, then some spots every so often, a hand-sized puddle where the deer stopped, and so on. You'll go a long way before you have used up the quart of water, and you'll still have another one-half quart yet to go to make up the three pints needed.

Depending upon where he is hit, an animal bleeds both internally and externally. The novice bowhunter often fails to think of the bleeding inside the animal and considers that what he sees on the ground is it. He will come to a small puddle on the ground and think to himself that the deer can't go much farther before he completely runs out of blood, yet by trying the water experiment, you can see how great an amount of blood actually would have to be spilled to cause death.

Normally, the greatest volume of blood is bled internally. That which flows on the outside comes mainly from the wound through the hide and first layers of meaty tissue. This blood often does not amount to much and can be misleading as to how badly the animal is hit. This is where your use of razor blades can be a great help. Just as with a nick on your chin while shaving leaves a good blood trail, the cut through the hide with a razor blade causes far more bleeding of the hide than does a duller edge on regular broadhead steel. If the blood flows from the hide rapidly and steadily, it is not likely to coagulate. Its continued flow insures a good blood trail for tracking, and in the case of an animal not seriously wounded, can be the actual cause of his death.

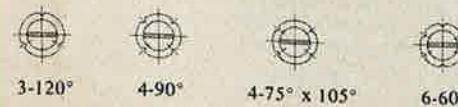
It is the wise bowhunter who bears constantly in mind that it is bleeding which kills and takes the necessary preparation to see that his broadheads are always sharp . . . razor sharp! ●

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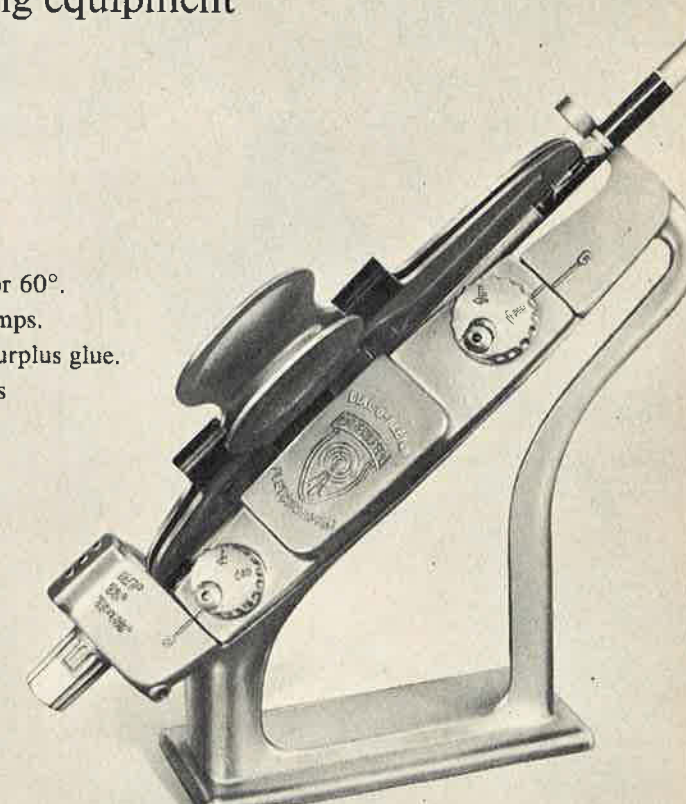
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Dept. B



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"You're crazy, Jim. How could you shoot higher on the bale when the helical fletch creates more drag?" said Joe, with a pleased look on his face.

"Helical fletching is much more efficient and goes through the air with less drag," said Jim. "Look how more effective helical gears are in a car than straight gears."

If you have been around archery very long, you have certainly heard something very similar to this. Joe and Jim are arguing the merits of two different types of fletchings on arrows. While the helical fletch is not a new thing (I know people that used to pin fletch helical fletching back in the early Thirties), it has become quite popular in the last few years. Most of the fletching tool equipment companies now offer helical clamps, both left and right, as well as conventional straight clamps. Now most everybody puts some degree of spiral or angle on their feathers even if they are fletching with a straight clamp. The theory of this is to rotate the shaft, thus stabilizing flight. The helical spiral fletching differs from a straight spiral or angle fletching in that the feather spirals around the shaft just like one of those fancy starcases that goes around a pole. There does

not seem to be much controversy as to whether the helical fletch will spin and stabilize an arrow as well as a straight clamp angle fletch. However, the arguments rage hot and heavy over whether the helical will reduce the velocity of an arrow quicker than your straight angle fletch.

This sounded like a pretty good project for us here in the Tackle Tips column. Deciding to be objective and scientific about this, we first went over to Altadena to see Dick Young (a fine arrowmaker who runs Doug Kittredge's arrow department). After explaining our project, Dick looked out of the corner of his eye at me and said, "That's funny, I wrote an article about the same thing some months ago but hesitated to have it printed in a magazine."

I talked around a little bit, trying to get Dick to commit himself with little results. He said that he would wait until I had published my article and after they nailed my hide to the barn door, he would rescue me.

I had Dick fletch up one dozen 1616 Easton aluminum arrows with 3 1/2-inch fletching. Six of them were fletched using a helical feather clamp and six were fletched using a straight clamp with a very slight angle. All twelve arrows were fletched in the same type of fletching jig and the only change was in the feather clamp.

At the crack of dawn the next morning, clutching these brand new arrows in our hot little hand, we hied ourself out to the Sepulveda Basin to do some testing. The Trajectrocaster was in the back along with several bows, while Harry Proctor, a fine engineer and photographer, was sitting beside me. Harry was going to do the photography and take notes and figures as he likes to work on a theoretical basis as much as I do on the practical side. We make a pretty good team.

The place where we were going to shoot was at the site of the 1963 National Flight Shoot. It was a beautiful place to shoot, all covered with lawn, and outside of a few people



The arrow visible on the left boasts a helical fletch, while the one on the right was fletched with a straight clamp on an angle. Note larger frontal area on helical.

exercising their dogs, was deserted at seven o'clock on a Sunday morning. One thing we had not reckoned with was the wind. After setting up the Trajectrocaster and screwing it up to an even forty-five-degree angle, and blocking the legs, we proceeded to shoot our arrows. The wind was blowing in gusts of probably fifteen to twenty-five miles an hour and it's amazing what this could do to an arrow traveling through the air for 180 yards or better. The first twelve arrows were inconclusive, as the overlapping of the groups was so great as not to give any definite indication of one arrow going further than the other. Our theory on this test was that the arrow that traveled the furthest when shot from a forty-five-degree angle would be the arrow that had the least amount of drag, consequently would give a flatter trajectory over any given distance. After shooting this group of arrows, we knew that we would have to shoot on an absolutely

(Continued on page 40)

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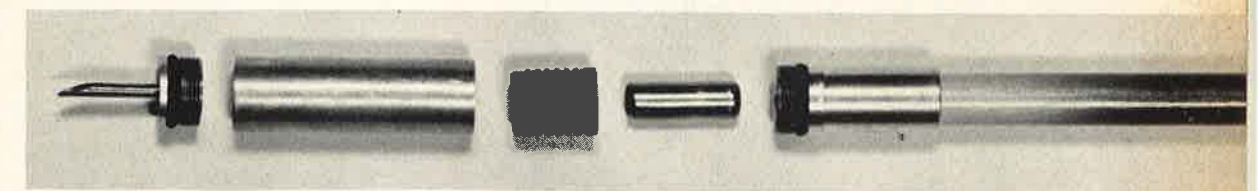
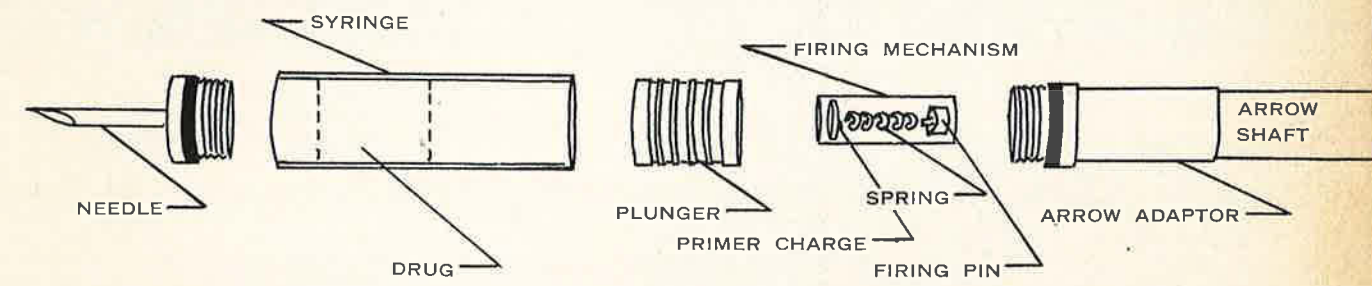
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 **THE HYPO-ARROW:**

PRO OR CON?

By Dan Quillan



It was a beautiful, clear morning. Since daylight, I'd been on my portable tree stand on the edge of a planted food patch in southwestern Alabama. The field was full of sign but the deer were not moving. At 10 a.m. I gave up and went back to the hunting lodge for lunch with Dr. Frank A. Hayes, head of the Southeastern Wildlife Disease Study and members of the Alabama Game and Fish Department.

This hunt was as off-beat as a hunt can get. The season was closed and I didn't even have a hunting license, but in my pocket I carried a temporary permit for scientific collections of deer. We were guests of the State of Alabama, here to determine just how effective the hypo-arrow really is.

After lunch and some discussion about whether the deer would move before late evening, I left the group and started back to my stand. As I approached the edge of the field, twelve white flags went bounding into the woods. Who would have expected them to be feeding at noon? I climbed up on my stand, glanced at my watch and settled down for a long vigil. Surely, after being spooked out of the field, the deer would not return until late in the afternoon. Twenty-four minutes later, the first doe came through the trees from the opposite side, looked carefully around and began feeding out into the field some one hundred yards away. A minute later, the next deer showed up and began to feed with a little less caution. Moments later, the rest of the dozen trooped out in an unconcerned fashion. I watched the deer in the field for about an hour, knowing that at any moment the other hunters might decide to leave the lodge, return to their stands and spook all the game.

Is This The Answer To The Hunter's Prayer— "Oh, Lord, Please Grant Me A Clean Kill Or A Clean Miss!?"

Forerunner of the hypo-arrow was the hypo-gun, which has been used in zoos and in animal studies where it has been necessary to immobilize the animal without killing it. In such instances, drugs of a non-fatal nature have been used. Pictured are: 1. Specially designed Crosman pellet gun for launching the syringe. 2. Handgun used for same pur-

pose. 3. CO₂ cartridge to furnish power for shooting the syringe. 4. Pushrod for assembling the syringe. 5. A complete breakdown of syringe assembly. 6. Assorted syringe barrels. 7. Syringe when assembled. 8. Acid solution for the syringe assembly. 9. Assorted needle types. Arrows use only a part of the items illustrated here.



My arrow carried a 250-grain syringe on the point, making elevation quite a problem, as the deer were now about fifty yards away. I waited until I had two deer lined up and held high on the hip of the nearest deer. This was quite a switch, aiming at the steak end of the deer, but I was only following instructions. The over-weight arrow seemed to float out on an extremely high trajectory. I was glad I had lined up that second deer for insurance, but then the weight began to tell. The arrow dropped into the round steak and simply bounced off. Deer exploded in all directions and then headed for the woods on the opposite side of the field. I tried to keep my eye on the doe I had hit, although I figured nothing could have happened as my arrow had bounced off her so quickly. I was sure I had experienced some kind of misfire. I came down immediately from my tree stand and walked out into the field, picked up the arrow. It had discharged properly. I looked over at the woods and picked out the trail the deer had taken and headed for it. Just as I entered the woods, I almost tripped over the carcass of a fine doe. She had covered about sixty yards, and when I placed my hand on her, I could feel her heart beating, although she was out like a light. I knew that her heart would quit beating in five to ten minutes, so I took out my pocket knife and stuck her. Her heart pumped the deer completely dry and that night this deer provided some of the finest venison stew ever eaten by man — the meat aged or otherwise.

Now let's go back to the beginning:

The primary development of the automatic projectile syringe had nothing to do with archery. All over the country there were places where deer were needed for stocking purposes, yet there was no economically feasible method of capturing deer. A scientific team consisting of Frank A. Hayes, D.V.M., Jack A. Crockford, B.S., James M. Jenkins, Ph.D. and Seldon D. Feurt, Ph.D., backed by the Palmer Chemical Company, of Douglasville, Georgia, decided to do something about this.

The crude beginnings consisted of a conventional air rifle, modified to take a long dart made of a drill bit and coated with a curare paste. The results were encouraging but the fatality rate of the captured ani-

mals ran to fifty percent or more. Curare was too unstable and too critical. Absorption of the paste was too slow. Some method was needed to inject the drug in liquid form into the muscles of the animals. The answer was a metal hypodermic syringe that would inject its contents into the animal on impact. Once this was developed, the field was opened for injecting animals with everything from tranquilizers to antibiotics. Hundreds of drugs were tested to determine which was best for capturing deer. Among these was a relaxant, **succinylcholine chloride**. It was found that this drug in a small dosage of fifty milligrams would put a deer on the ground in from ten to sixty seconds. The harder the deer ran, the quicker he fell. All the experimental animals shot became unconscious in less than one hundred yards and died within five to ten minutes. This indicated that **succinylcholine chloride** would be good for hunting and it was only a matter of time before someone suggested putting a syringe on an arrow.

There are many advantages to the use of the hypo-arrow and some possible disadvantages which have made its use in hunting controversial. Most of the disadvantages lie in the realm of unknown factors or in the mind of the deer hunter. Some excellent articles have come out that showed a comprehensive knowledge of the subject. Other articles have been published in which the authors showed their ignorance of the hypo-arrow and some, their ignorance of bow hunting. This has added to the confusion and has brought about the outlawing of the use of the hypo-arrow in some states.

Let's take a look at the advantages and disadvantages of the hypo-arrow from an archer's standpoint. The syringe weighs 250 grains, fully loaded. This, to the archer, means a high trajectory and a need for a stiffer arrow in any given bow weight. The use of the hypo-arrow would practically eliminate crippling loss — you either get him or he goes on his merry way. Some hunters have felt that this makes its use unsporting, but the fact remains you still have to get the shot and hit the deer. It has been said that the hypo-arrow is too mechanical, too modern, but doesn't it compare with the blow gun's curare-tipped dart in the same way that the modern composite bow and razor sharp broadhead com-

Below: Dr. Werner P. Heuschele, veterinarian at the San Diego, California zoo, aims to fire at a mule deer that requires medical treatment but which first must be subdued. White spot on deer's flank is syringe while still airborne. (Right) The deer is more curious than hurt by the dart-like protrusion in its hip. Moments later, the deer was unconscious but unharmed. Photos were taken in 1960.



pare with the flint point and hickory bow of the Indians? Yes, he did at times use drug-tipped arrows.

The use of the hypo-arrow will bring out thousands of untried bowhunters. I, personally, think this is good. All of us were beginners at one time. If we did not have the numbers of bowhunters we have today, we would not have the special seasons we now enjoy and bow-hunting might possibly be outlawed. Practical politics often shape our game management today. Without large national, state and local organizations, we bowhunters would be forgotten.

One of the real surprises in using the hypo-arrow is the high quality of the meat. There are two possible reasons why the strong flavor is gone. When a deer is shot with a hypo-arrow, the hunter goes after him immediately. When the hunter gets to him, the deer will be unconscious but his heart will still be beating. The proper procedure is to stick the deer at once. The heart will pump out all the blood, leaving a carcass that is completely bled. I have had the opportunity to compare the carcasses of two deer killed the same day. In the one killed with the hypo-arrow and properly bled, the meat was considerably lighter in color than the one that was not.

The next question this brings up is what happens when people consume the meat that has been injected with the drug? The answer is Nothing. It has been scientifically demonstrated that **succinylcholine chloride** breaks down into harmless components within a few hours in the flesh of an animal.

And now, the big kicker: What would happen if a man were hit by this weapon? No one knows for sure, because it hasn't yet been tried, but the best information that I have secured from the scientists who developed the hypo-arrow and from medical doctors (including anesthesiologists), is that the 50-milligram dose received intramuscularly would probably only make a man groggy for a few minutes. Or, if by chance the needle injected into a vein, the victim could be saved by the administration of artificial respiration. People are just not as sensitive to the drug as ruminant-type animals and for that matter, neither are bears, so don't get any ideas about a brownie with a dose like this! From what I know right now, I'd rather take my chances on being hit with a hypo-arrow than a broadhead.

There is also considerable misunderstanding about

accidentally sticking yourself with the needle. Under these circumstances, the hypo-arrow would not inject because the arrow has to be traveling in a forward direction with considerable force before the injection mechanism can be activated upon impact.

Another one of the advantages of the hypo-arrow is that it can be shot from a light bow. One of the bows used in the research on killing deer was only thirty pounds. This would enable many people who are incapable of handling heavy bows to carry an effective weapon into the woods.

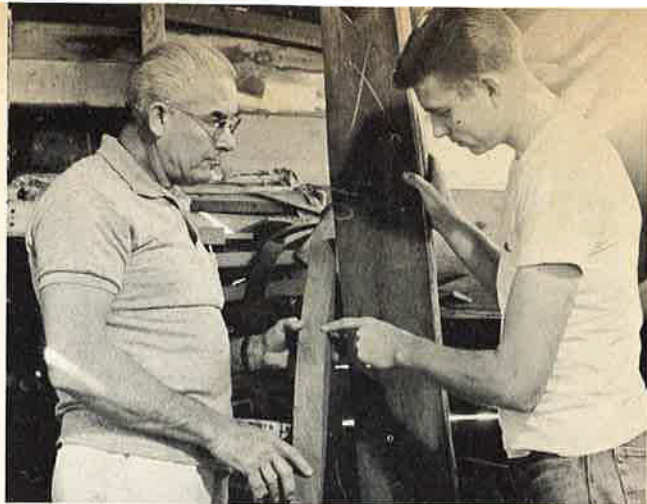
(Editor's Note: Hypo projectiles of a similar nature, fired from gas-powered guns, have been in use by police officers in some areas of specialized situations for some time. They have been used in riot and mob control and, in at least one instance, one of these devices was used to quiet — without harming — an unruly prisoner, who was literally wrecking the jail in Athens, Georgia. The sheriff involved stated later that use of the syringe undoubtedly saved several of his deputies from taking severe beatings that they no doubt would have suffered in attempting to quell the troublemaker.)

What is the future of the hypo-arrow? It has already been accepted as a tool by veterinarians. I have taught quite a few of them to shoot a bow and they now are using it in their practices. Is this the tool that can bring about the continued growth and expansion of our sport or will it remain one of those great possibilities that is never given a fair chance because of prejudice and ignorance?

(Editor's Note: At present, only two states have authorized the hypo-arrow for hunting purposes. As in the case of bowhunting, it would seem that a long legislative battle is ahead before the other states will approve such hunting.)

However, a new system already is in the experimental stages. Instead of depending upon a syringe to kill game, the latest innovation utilizes an ordinary broadhead, but just behind the arrowhead, attached to the shaft, is a small rubber "balloon" which is filled with death-dealing crystals. When the broadhead penetrates the deer or other game, this balloon-like affair is peeled back, releasing the crystals to be absorbed into the bloodstream of the animal and bring about almost instant death.)

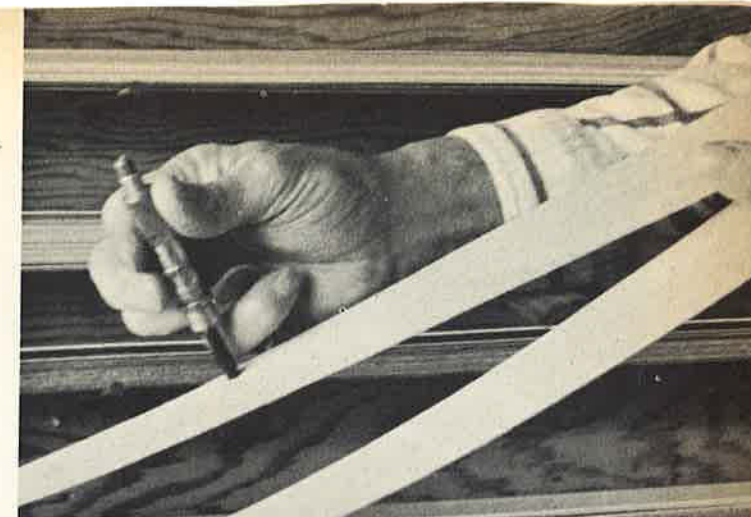
HERE'S A
STEP-BY-STEP
LOOK AT THE
BIRTH
OF A
BOW
BY C. R. LEARN



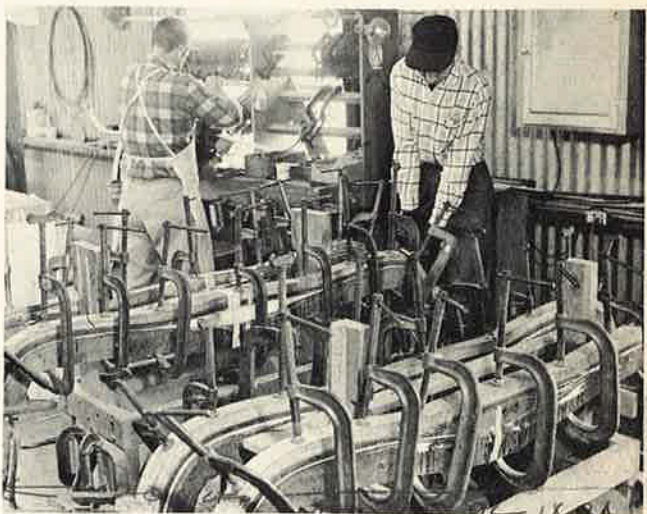
1. Carl McCall (in glasses) and Fred Anderson select riser sections from stock of exotic hardwoods found at the FASCO plant. Woods are selected for beauty, strength, and are checked to assure grain, color will produce finish.



2. Anderson uses specially built sander with template to give riser wood its initial shaping. Template insures uniformity in each riser. The sander was designed to speed the work without sacrificing any quality in workmanship.



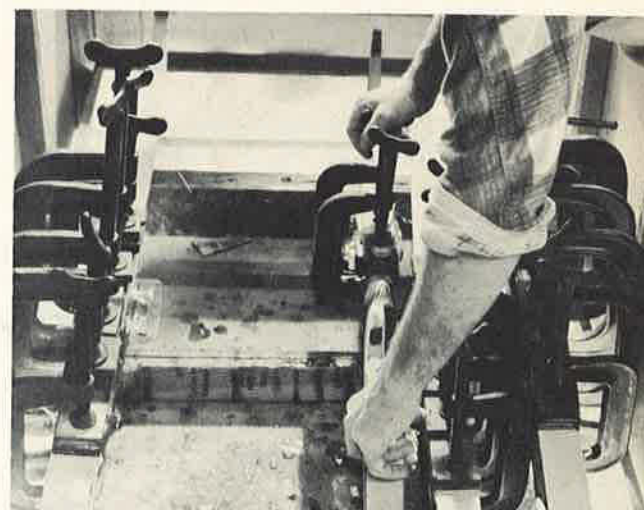
3. Bowyer Mert Ankrum uses micrometer to check thickness of hardwood laminates used in limb construction of bows. In rack are laminates of differing thicknesses to give different weights to bows when manufacture is finished.



4. Ankrum tightens clamps on forms after gluing laminates, fiberglass to riser section. These forms are held at constant temperature, pressure for proper drying and forming. In background, Leon Rathbun epoxies laminations.



5. Craftsman Rathbun uses epoxy glues to add tips to the blank form after removal from the drying form. These hardwood riser laminates and bow tips add beauty and strength to finished bow. Here, it is in early manufacture.

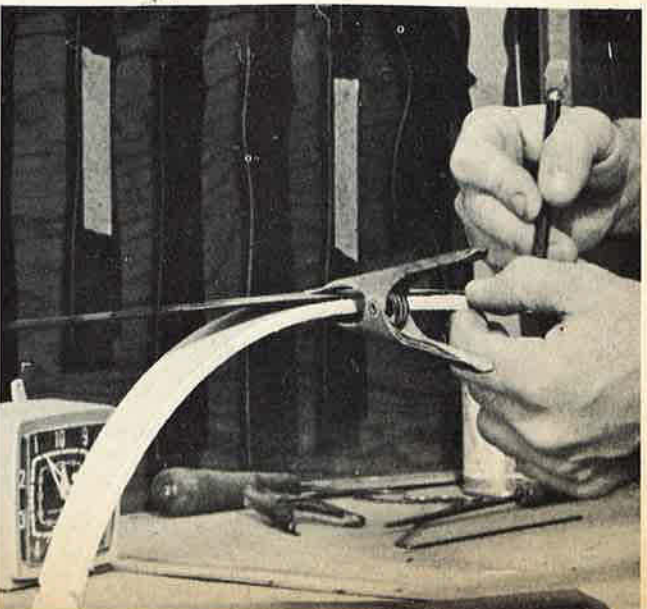


6. After the laminates have been glued to the riser section and the bow tips, the finished form is clamped with even pressure and placed into a drying box to age. Experienced bowyers recognize importance of aging process.

7. After blank is removed from the drying box, the limbs are scribed with aid of a template. Hanging on the bench are templates of other FASCO bow designs. These templates are clamped into precise position prior to scribing.

8. Rathbun uses bandsaw to cut scribed blank along the pattern. Bandsaws have rests on them for the blank to run through as bowyer cuts the shape of the limbs, forms window, makes fine cuts to add to first shaping of bow.

9. The use of a special machine gives the bow blank its first cut in the process of making the rough grooves for the string. This wheel is guided by a jig that is so designed that it consistently gives same results to bows.



IT started with a stick. Somewhere back in man's beginning some lazy, inventive caveman found that by bending a stick and fastening the opposite ends with a piece of vine, skin or other means, he could project another stick farther and faster than he could throw it. Since then, man has been bending and experimenting with bent sticks to throw straight sticks in the name of archery.

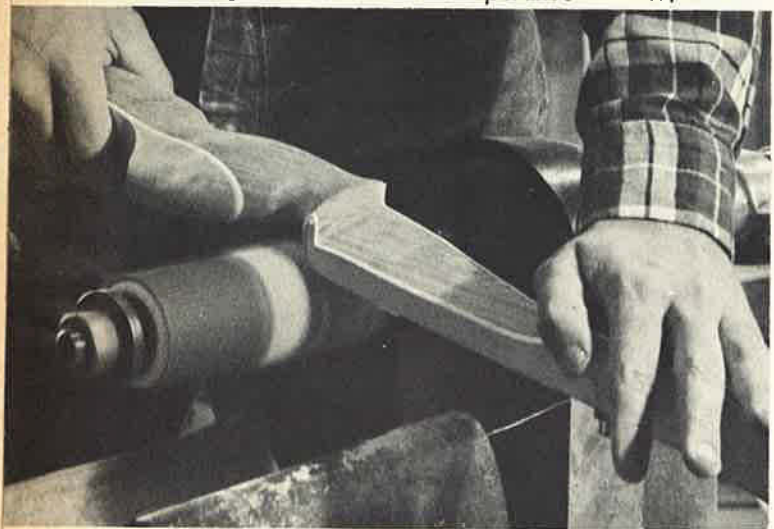
The bowyer's trade has been followed for centuries and it still requires a true craftsman. Since the first bent stick, man has tried just about all combinations of woods, but the modern laminated bow of hardwood and fiberglass back and face has been perhaps the most successful. The Turkish bow was, and still is, a work of true craftsmanship but the materials used were too susceptible to temperature and humidity. The modern laminated bow still is not perfect but comes close to being so.

There is a tender spot in one's memory of the first bow, whether it was a hickory, yew or a new laminated model. After several years of shooting a bow, a person becomes curious about how bows are made.

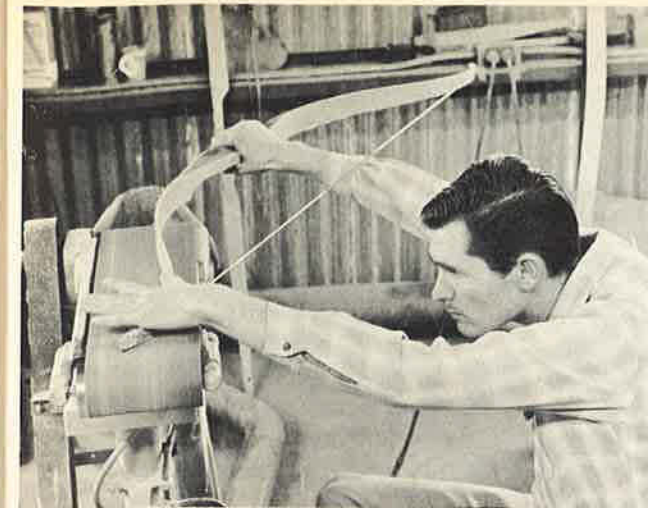
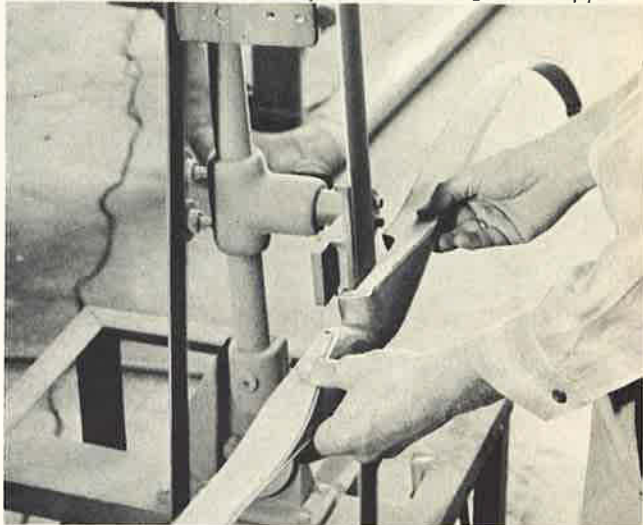


10. Above: Horizontal sander removes some of the rough edges and shape of bow becomes more evident. (Right) Bruce McCall uses pulley system with scale to check the weight of a bow. Here, weight and alignment are critical.

13. Belt sander will not follow the curves and contours of styling, so this pneumatic sander is used to rough sand around handle. This sander is a tube filled with air, with a sanding surface attached to operative exterior.



14. Again, since conventional machinery would not afford desired results, the FASCO bowyers designed this 118-inch vertical sander. Sight window is rough sanded on this machine until the final shape of bow begins to appear.



11. After being checked for weight, limbs are sanded with finer toothed belt. McCall lightly sands limb, then places tip on floor to check alignment, determines whether string has pulled over, then gently sands the bow's tip.

15. A wood file is used to file the fine surface on the bow's sight window. This assures a smooth, flat surface from which the future owner can shoot. Despite amount of specialized machinery, much hand work still is required.



12. Jim Keller uses vertical sander to rough shape a bow after McCall has finished first alignment. This brings out grain, beauty of the wood, which has been underdeveloped during many stages the bow has previously undergone.

16. String grooves and tips also are hand-filed. This is another step that cannot be accomplished by mechanized means. These bowyers take pride in their work, finishing each bow as though it is going to be used by the maker.



The whine of power saws, the hum and vibrating of the power sanders conflicts with the quiet studied atmosphere in the Fasco plant. Here ten craftsmen mold, shape and finish the Fasco target and hunting bows. These bowyers combine sixty-two years of technical knowledge to make a bow that will withstand the tremendous pressures of repeated shooting found in modern archery.

The unhurried atmosphere belies the production of the plant and the quality of the finished bows. These men take pride in their work and they have just reason to be proud. The finished bows show the latest in design and incorporate the combined knowledge of these men to make them the best product possible.

The Fasco company began in 1957 in San Diego, California, when three men, Russ Fogerty, Willy Alvarez and Charlie Smith, were doing contract work

for the Gordon Company and decided to set up their own plant and developed the Fasco bow. The name Fasco came about by using the initials F, for Fogerty; A, for Alvarez; S, for Smith, and CO to designate company. Wilson White worked as manager. The first transfer in the company was from the founders to Emmitt Ries of San Diego. Ries developed carving on the bows and hired Nils A. Hultgren, a woodcarver who did work for Weatherby Arms. Ries produced bows with carving that were sold for \$285.

After two years, the company again changed hands and was sold to a Salt Lake City group headed by Duane Erickson. Bob Williams of Seattle Archery, Inc., of Edmonds, Washington bought Fasco in December, 1962. At that time Carl McCall was hired as general manager.

The company recently, in February, 1964, acquired

Drake Archery and on April 1, 1964, became exclusive manufacturer of the Bud Morris Stylist. They also manufacture a line of bows under the Mercury label.

The Fasco Division of Seattle Archery acquired Drake Archery Company early in 1964. Fasco makes three of the better known Drake bows; the *Shark*, *Fire-drake* and *Hunter-Flight* bows. These bows are made according to the Drake formula as to forms, style and materials, including *Bo-Tuff* fiberglass.

Harry Drake retained the flight portion of Drake Archery and makes his own flight bows under the Drake Archery name. Fasco makes the popular styles of Drake bows and Harry Drake, national flight champion, continues to make and shoot the flight bows that he has made famous.

Throughout the change of companies from one stockholder to another, the quality of the Fasco bow

has not only been maintained, but improved. The present bows sell from \$29.95 to \$139.95, and are made in target and hunting styles. The carving process has been maintained and has been incorporated in the new *Futura* model.

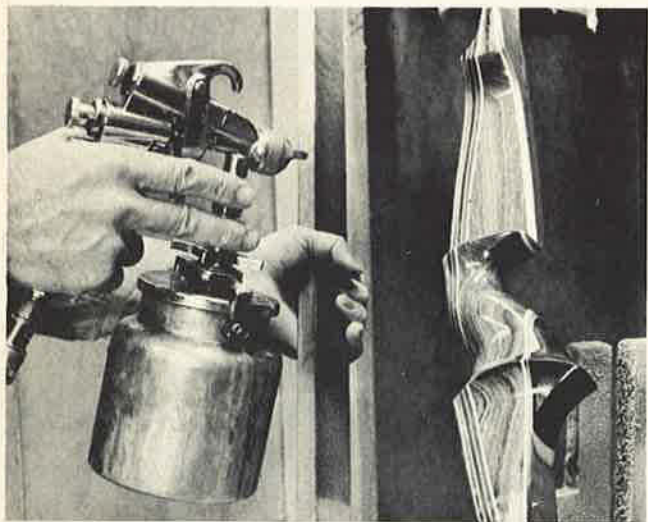
The finished bows are shipped from the plant in El Cajon, California to Edmonds, Washington, where they are distributed to dealers. The Seattle Archery Company maintains a prompt delivery service on all products and holds a \$20,000 stock on hand for immediate shipment to 1600 active accounts.

When you walk into the plant, see the stacks of laminate and strips of fiberglass, you would never believe these could be combined to give the speed and beauty of the finished product. The risers are made from exotic hardwoods from the corners of the globe. Rosewoods from Malaya, Mexico, and Brazil; imbuia

from South America; walnut, birdseye maple, fiddle-back maple, myrtle, and lacewood from the United States; bubinga from South America, and coca bola from Costa Rica and South America.

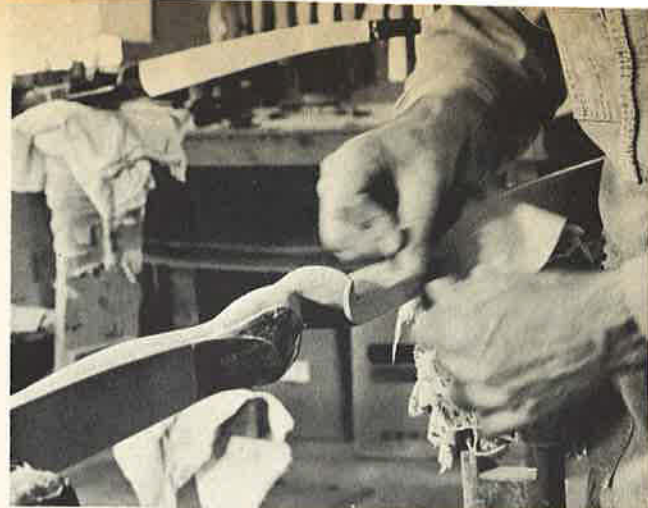
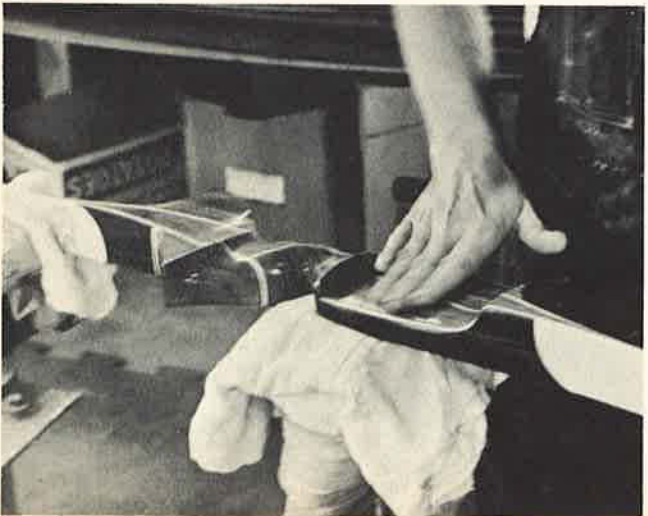
These woods are combined with hardwood laminates, usually maple, and fiberglass is used on the back and face. A micrometer is used to check the thickness of the laminates and fiberglass. The bowyer can estimate the weight of the finished bow within five percent. The knowledge of woods, bonding elements, fiberglass resiliency and above all, pride in craftsmanship produce a bow that makes any archer proud to show it to other archers.

"How can you make a bow and not know the problems of the archer?" This type of interested and intelligent thinking, incorporated with true bowyer craftsmanship, combine to produce a bow that is not only beautiful, but accurate and trustworthy. ●



18. The bow is taken to the spray booth and placed on a rack. In the case of the Futura model, the carving has been completed. The semi-finished bows now are given a coat of epoxy spray meant to bring out color in the wood.

20. Nearing the end of the production trail, the bow is removed from the drying cabinet and the final rubout is accomplished by hand. Each finished bow is guaranteed for two years against faulty workmanship or materials.



17. After the sight window and the string grooves, as well as the bow tips have been worked to the maker's satisfaction, the bow then is given a finish sanding by hand. There has been room for error in numerous steps.



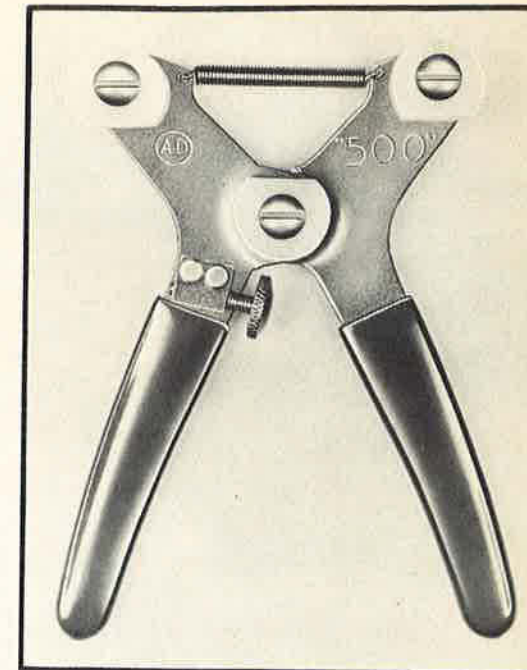
19. Bows are removed by Mart Mathew after spray with epoxy and placed in drying cabinet. This finish not only adds to the bow's beauty, but has a practical use in that it protects the woods and laminates for countless years.

21. Carl McCall checks the finished product prior to its being wrapped for shipment. Taken into consideration are alignment, finish and general quality. Each bow also is fitted with dacron string before shipment to a buyer.



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**BOW &
ARROW
TEST**

Colt's New Plainsman & Hi-Power

Neither Snow,
Nor Wind
Nor Rain
Could Still The Speed
Of This Pair!

By Jim Dougherty

FIELD testing a bow can offer a few problems, if one wants to give a bow a real wringing out under actual conditions. Taking any new hunting equipment, gun or bow, down to the local range and touching off a few satisfies the immediate desire to shoot it, but really doesn't seem to be the final answer.

When we decided to go ahead with our next field theorizing with Colts' latest offering to hunt-doms' archers, we sat around the office for a good long time trying to figure something to test them on. It was getting to be a bit late in the year and the availability of unused fields in which to test, complete with game, looked nil.

Ray Rich finally uncorked a jewel from his fertile and apparently highly imaginative mind with "How about pheasants?"

I set down the coffee cup and said, "Good idea. I'll run home and grab up one of my shotguns."

"No, man, seriously. Let's sashay out to the Etiwanda Game Association shooting preserve and wallop the ringnecks." I'm game for anything and agreed but there were to be some stipulations, like let's throw the bang-bangs in so we can get some eating material after the sillier games are over.

Actually we didn't feel it would be that big of a problem. Hunting the longtails over dogs would offer some fine bow shots at the rising

birds — difficult but not out of the realm of possibility. In the past, I had skewered a few of these noble birds with stick and string, all pretty much on accident prone birds, but then there should be a few on the club whose luck had run out.

We set a date and I departed for the shop to get things in order and advise Ron Holdstock of our proposed project. A little practice with some Saunders Bow Birds would be a good way to try and sharpen up.

"Pheasants? You guys have really lost your marbles!" Ron was apparently not convinced that this was the real answer. He shook his head in disbelief.

"Look, man, if Nancy Vonderhiide can try, you can. After all, she's a girl." To this he said, "Yeah, she is," and began selecting shafts to make us up some super flu-flus.

Colt has come up with a nice pair of hunters as far as eye appeal goes. We had selected the *Plainsman* and the *Huntsman Hi Power*, both in the short bow category. The *Plainsman* is the longer of the pair at sixty inches, the *Hi Power* a compact fifty-six inches.

Being commercially involved in the archery business, the subject of bow prices interests me quite a bit, and I'm sure it interests the consumer a great deal more! The *Plainsman* is really competitively priced at a moderate \$39.95; a lot of bow for the required bananas.

There are no fancy frills on this little feller either; the riser is a functional three-piece arrangement of pure maple. In keeping with the trend, I suppose it does boast what I imagine to be modified stabilizers

Prior to making a serious try for a fast-flying pheasant with Colt's new bow, Holdstock tried a few practice rounds against Saunders Bow Birds.



Colt's *Plainsman* (Right) is compared with the *Hi-Power* model.

although their function is more ornamental. For a bow of sixty-inch length, it has a short handle riser, and with the high gluing radius from these stabilizers, I suspect there may be considerably more stress at the fade out of the handle section than is necessary. The glass is black and the overall appearance is one of pleasant symmetry.

There is just the right amount of deflex in the limb to allow long draws without excessive finger pinch, yet keep the bow as fast as possible. The tips are wide and twisting should be no problem. Ron and I plotted the draw on a chart up to thirty inches and the bow is definitely as smooth as her competitors with few exceptions, as there is no excessive build up of weight around the twenty-eight-inch plus mark.

For the most part, the same can be said of the *Hi Power* with which Ron had selected to slay his pheasants.

The bow is definitely more elaborate in the riser section with several woods involved, attractively arranged to compliment each other. It also possesses the "stabilizer" idea and the same high angle at the fadeout is visible here.

With most short bows — and the *Hi Power* is a shortie for sure — some finger pinch is going to occur. Ron, being a longer bow man if it comes to a knock down choice, did squawk about sore fingers after our first trial session with the bow birds and sighting in on bales. Plotted out, she does build up faster, which is to be expected, but she is surely in the running for a good shooting shortie.

Most of our shooting for this session would be under the thirty-yard mark and we restricted our practice with this in mind. With the close range flu-flus, we found we could clobber the hand-thrown bow birds quite well up to twenty yards.

After that, it became sort of a shoot and hope proposition. As these arrows lose their speed quite rapidly, the element of doping out proper lead was sort of a problem. Being used to faster shooting arrows with regular type fletch warped our thinking.

For the big game hunter, it is noteworthy that both bows are more quiet than might be expected. This, to me, is a real problem and I always give it considerable thought. Perhaps, I run into a greater number of high strung animals or maybe it's just that I like to be a real sneak. I'll shoot a deer in the back!

I must confess that I did not find the handle on my bow really comfortable as it is too wide in the throat and my thumb kept hanging out in the air and sort of separated from my hand. I do have a rather small hand, however, and this is nothing to get upset about. Most

archers that get a stock bow eventually wind up altering the handle a bit, anyhow.

These bows do shoot well and both of us felt that we had a better than even chance to end our wives' yammering for a few pheasants for the table. If not, there was always the old scattermatics.

In California, around the Cajon Pass area where the club is located, they have frequent high winds that are referred to by the natives as "Santa Anas." In the Midwest, I believe they call them tornadoes.

The best laid plans are not always favored by the gods and the one with the big breath had selected this day of pheasanting to open his big mouth.

Arriving at the club, we were treated to the sight of a goodly group of jovial sportsmen trudging in to the club house for their mid-day refreshment, coats bulging with game, yet complaining in the way of all hunters of poor scenting conditions and blown patterns. The sight of the brilliant roosters started that old clanging in my middle that all devoted upland bird shooters seem to get at the prospects of a hunt.

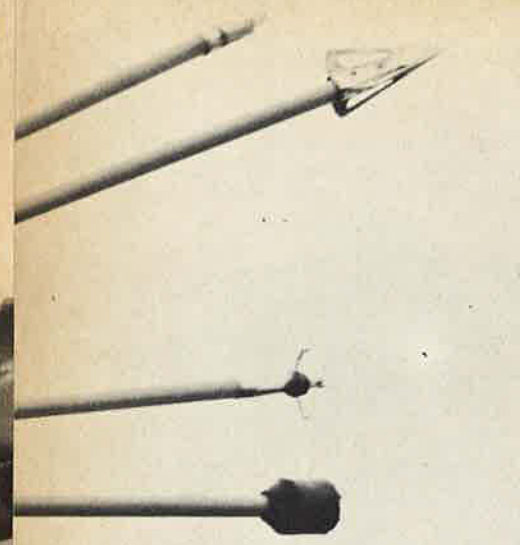
Undaunted by the comments of our scattergunning brothers, we elected to give it a go regardless of the wind and see for ourselves first hand. Our host, H. I. Van Frank, offered himself and his two beautiful English pointers as guides. With Ray Rich laden with three cameras and Jack Lewis laboriously lugging a few rolls of Tri-X film, we took to the field. It wasn't long until we realized what we were up against as the first few shots were blown far and wide, the wind catching the feathers of the arrows like sails on a schooner. I switched to a regular field arrow with rubber blunt and managed to slip one through the tail of a whirring hen, but it really looked like no go. My oldest boy, Jimmie, really looked the best as he got off a shot at a sneaking rooster on the ground with his twenty-pound *All American Junior*. He was one excited seven-year-old.

We finally got the message that this was not going to be putting any birds on the ground. By now my trigger finger was twitching to a point that I thought it would run off and leave me, so we repaired to the club house at Rich's suggestion to re-arm. Besides, I had a new .410 pump I was dying to try

out. The day wasn't a bust game-wise, as over the hard working dogs who were really up against it, we managed to bag out on the beautiful birds by dark, but our bow test was lacking in game. For what few shots we had, the bows handled nicely and were as fast and easy to point as the smoothbores to which we traitorously defected.

With several days left before typewriter time, Ron and I decided to give some cottontails a bad time one morning before going to work. An early start was planned but we failed to get away at the appointed hour. (I had turned off the alarm). This resulted in arriving after the bunnies had retired to the edge of their holding cover. Hunting cottontails in the cactus patches can be a most pleasant way to spend a morning, but this turned out to be an exception to the rule. The wind still was blowing and the rabbits

(Continued on page 61)



A variety of arrowheads were used in the bunny safari. These ranged from ordinary broadheads through blunts.

With a high wind, the bowhunting of pheasants was tough. Even the highly trained dogs found it difficult to gain the scent due to the elements.



In second segment of the Colt test, Ron Holdstock draws a 28-inch blunt before loosing it at nearby rabbit.

Determined not to go home empty-handed, Dougherty traded bow for shotgun in latter stages of safari.



Dougherty reaches for one of his hand-fletched flu-flu arrows as one of the dogs goes to point on a pheasant.

STINGRAY With the longbow

"STINGAREE!" Warren shouted as he pulled back his bow and let an arrow fly into the knee-deep water of Barnegat Bay. Instantly the surface water erupted into a mountain of spray as a sinister grey object darted off, uncoiling the line which was attached to the tip of the fishing arrow. Fifty yards of forty-pound test line paid out before the stingray slowed down enough to permit us to attach a float to the line and throw it overboard.

We followed the fleeing ray by the tell-tale plastic jug as it headed toward the safety of deeper water.

"We've got to head him off and stick him again or we'll lose that ray in the channel," Warren said. Starting the outboard, we circled around the stingray and caught him just on the edge of the deep water. Warren released another arrow at point blank range, but the shaft only pierced one of the ray's fleshy wings, causing it to turn and make another desparate run toward the shallows.

Following close behind and being careful not to tangle the fifty yards of trailing line in our propeller, we eased to within fifteen yards of the ray when he started to slow down.

Blood was showing in the water, and we knew that Warren's first shot had hurt the ray, but there was still plenty of life left in him, and we had to be careful.

A stingray is one of the most dangerous creatures to roam the tidal bays and rivers from Maine to Florida. Should an unlucky swimmer happen to step in or near a stingray, the venomous spike on the long whip-like tail can be driven far into an ankle or leg, causing an extremely painful and slow healing wound: there have been several deaths due to sting of a ray.

The stingray is closely related to the shark, but resembles him only in miserable disposition. They feed primarily on clams, crabs, and small fish which they catch on the warm shallow water flats. Frequently the ray burrows down into the sandy bottom with only the two eyes exposed. They are nearly impossible to see, which makes them a constant threat to bathers and other persons wading in the shallow water.

Rays up to one hundred pounds have been killed in the bays, but most are between twenty and sixty pounds. They frequently measure four feet across and seven feet in

length. The dangerous spike or spine is eight inches to a foot long, and is located midway down the tail, which has hundreds of tiny but exceptionally sharp barbs. The venom is contained in the spike, and the ancient Roman naturalist, Pliny, wrote, "Nothing is more terrible than the sting in the tail of a stingray . . . Driven into the root of a tree, it will kill the tree. It pierces armour like an arrow, and to the force of steel it adds the venom of poison."

During the last few years the stingray population in Barnegat Bay has increased to the extent that many people who used to enjoy wading after clams and crabs in the shallow water prefer to stay in their boats rather than tangle with one of these anti-social characters.

For years, ray spearing with a harpoon has been a great summer sport, but your aim must be good and you have to be close. Nine times out of ten the ray will race out fifteen or twenty yards ahead of the boat, and accuracy at that range with a spear is uncertain.

We talked Assistant Police Chief Warren Byrne of New Egypt, an excellent shot with the bow, into trying his hand at ray shooting. He

THERE IS DANGER
IN THIS NOVEL
SPORT — COUPLED
WITH SATISFACTION!

By Pete McLain

The stingray burrows in the sandy bottom and is exceedingly difficult to see. It is encountered in shallow tidal bays, rivers and is dangerous.



never had hunted stingrays, but if it was a legal target, he was all for it.

The morning on which we set out was bright, the water was clear, and there was only a slight breeze to ripple the water. We used a sixteen-foot shallow draft Barnegat Bay garvey to float over the sand flat where numerous stingrays had been reported. Warren stood on the bow of the boat with an arrow nocked and the carefully coiled line attached to the arrow's fishing tip. A float was kept handy to be attached to the line in case we stuck a stingray too big to handle. A large ray has tremendous strength, and if

held too tightly, it will either pull the arrow head out or break the line.

This particular ray was a big one, and when he headed back toward the shallow water we followed closely, trying for another shot. Warren released three arrows, but the twisting and turning ray provided a difficult target, and the arrows only stuck in the sandy bottom.

"We have to get closer," Warren said, so we again circled the ray, cut the engine, and poled the boat toward the moving float. Carefully we eased up on the ray without the motor noise to frighten it, and

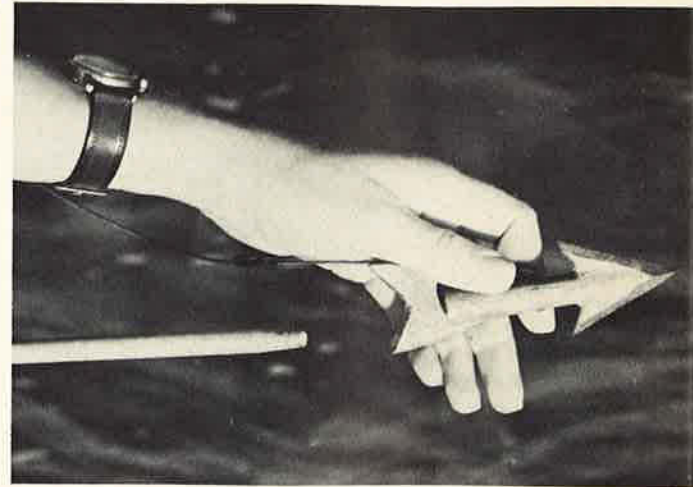
when we were within thirty feet, Warren pulled back on the bow, took careful aim, and drove an arrow directly into the center of the ray's back. Blood discolored the water, and the ray made several spectacular cartwheels and lay quiet.

We picked up the plastic float and pulled in the loose line, but coiled it in case our ray was not through fighting. As we picked up the slack and started to pull the ray to the surface, it made several attempts to sound, so we gave additional line. But every time the ray moved, it lost more blood, and we knew we were winning.

Archer hangs onto the fishing arrow which is imbedded in a stingray after shot. On larger rays, this line can be attached to a plastic jug float, so ray can be followed.



Detachable harpoon head has two sets of barbs and is attached to line by three feet of steel cable. One of best means is to cripple ray with arrow, kill with harpoon.



On a stingray harpoon, the tip is detachable from the shaft. Cork float is thrown overboard for ray to pull until it tires or hunter shoots again.



Finally getting the ray near the surface, someone yelled, "Get the gaff," and I sunk the big hook into the ray. Suddenly the whip-like tail lashed through the air and drove the wicked looking spike almost half an inch into the hull of the wooden boat. We all were amazed at the power of the tail and were thankful we were not on the receiving end.

By pinning the tail against the boat we replaced the gaff with the fluke of the boat's anchor for better holding and lifting power. Getting the ray up on the deck took two men; we quickly killed the creature by stabbing it in the brain. Our first stingray weighed just under forty-eight pounds.

"Let's go get another one," re-

marked Warren as he wiped the perspiration from his face and recoiled the line on his bow's reel.

The wind had picked up, making a chop on the water which limited our visibility, so we slowly prowled the shallow water with all hands looking for the muddy swirl and trail which meant that a ray had flushed ahead of us. Near a small island we jumped a ray which left a mud streak like a battle wagon. We followed the murky water and watched ahead until it suddenly cleared. The ray had evidently stopped and burrowed down waiting for our next move!

"Kill the engine and pole me nearer," ordered Warren. Quietly we pushed the garvey to within twenty feet of where we thought

the ray had stopped. Suddenly the water came to life. The ray folded his fleshy wings over his back, showering us with spray as he took off.

"Look at the size of him!" someone said, just as Warren released his arrow.

"Direct hit!" I yelled, and the ray vaulted to the surface, made a sharp turn, and headed back toward the boat. We could see the ray go under the boat and then felt a lurch that almost knocked us off our feet. The ray had made a pass at the boat bottom as he went under. When it came out the other side, we could see the arrow head well embedded in his back, but there was no blood; we were in for a fight.

In boating the ray, care is taken to keep the whip-like tail from thrashing about. Note stick being used to hold down the tail. Regardless, the poisonous spike penetrated boat hull.



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This ray had unusual double spike. One on top was broken against boat.

Following and harassing the ray for half an hour failed to tire him, so we chanced picking up the float and line, and carefully took a hitch around the boat's bow clear. As the ray ran, we gave just enough line to keep him from breaking off, but when he slowed down we tightened up. The ray fought hard, pulling the boat as he went, but we were not close enough for another shot. To shoot and miss while we were under tow would have meant that the arrow would be lost, and Warren had only three arrows. Every shot had to count.

The stingray pulled us around for half an hour with each of us taking turns at slipping and tightening the line as the occasion demanded. During the ride we flushed two other rays, and we wished that we had brought another line and float. We could have shot another ray and let it run while we were subduing this one.

Finally the ray started to tire, and each run was a little shorter. By keeping a constant tension on the line, we pulled the boat up to within shooting distance of the exhausted ray. Warren dispatched it with a carefully placed arrow, and the gaff was soaked in almost immediately. Again we lifted the ray aboard using the anchor and the gaff to control the thrashing tail.

This stingray was just over fifty pounds in weight, and had a four-foot tail with an eleven-inch spike. We chopped off the poisonous spikes for souvenirs, and to prevent any possibility of accidentally scratching ourselves. There have been several instances where people have stepped on the spike of a dead ray and suffered very painful wounds just from the scratch.

Doubling back to where we had seen the other rays, we found one of them starting to eat a soft crab. Warren missed once, and we followed the ray. His second shot hit the mark. This ray was considerably smaller than the others (it weighed in at twenty pounds), so we were able to hand hold the line and make a killing shot within a few minutes.

The wind had now picked up, and the bay water was starting to become cloudy, so with three rays draped over the bow, we headed back to the landing. The size of the stingray caused a small sensation on the dock and served to warn some of the onlookers that there were rays — big ones — lurking in the bay.

We hunted stingrays several more times during the summer, and added a detachable tip harpoon to our equipment. By sticking and crippling the larger rays with the fishing arrows, we were able to badger them until we could get close enough for a harpoon shot. The tip of the harpoon had a stout double barb arrangement with three feet of stainless steel wire attached to fifty feet of three-eighth-inch rope. With this heavy gear we could tie the ray to the boat, and after providing a short boat ride, the ray was ready to call it quits.

I don't know if we really reduced the stingray population in Barnegat Bay, but one thing is certain: Every ray we killed was one less that swimmers, crabbers or clambers might encounter. For real spine-tingling sport, there is little that compared with stingray shooting with the long bow. ●

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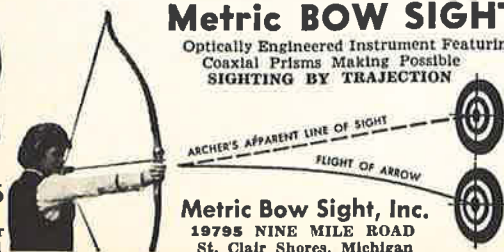
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Do-It-Yourself TARGET BUTTS

FOR BACKYARD
SHOOTING,

A LITTLE

INGENUITY CAN SAVE A LOT OF WEAR ON YOUR FENCE! By Rex Lear

TO an archer, a place to shoot is of prime importance. Next perhaps, is a target, or something at which to shoot. It really makes little difference. A bale of hay — a purchased target — just something that will stop his arrows and keep them in good condition.

A place to shoot is not a difficult thing to find. Almost any distance will do from ten yards to one hundred yards. His garage, backyard or an open field — any place. But a target is quite a different problem.

A target usually means a fixed thing. Something stationary. There are some that are transportable but as a general rule they are too heavy and bulky, therein lies the problem. What the average archer needs is a target that is inexpensive, transportable and light enough to handle.

There are, on the market, many that would suit any archer to a "tee" but may prove expensive. So, the next step — build it yourself.

"Difficult?" you say. Not at all. As a matter of fact, quite simple, inexpensive and very satisfying.

The material for such a target is easy to accumulate. It is part of your every day life. We usually throw away enough in a month's time to build an excellent target. Plain, everyday corrugated cardboard. It is used quite extensively by our modern indoor archery lanes, and I might add, most effectively.

A target butt made from this material can be as large or as small as the individual archer requires. However, the most popular size is thirty-six inches wide by thirty-six inches high and ten inches thick. This is light enough to carry, and yet big enough to accommodate almost everyone.

The first step is the most time consuming. That is of course, unless you are able to find a supplier as we did. The Golden Arrow Indoor Archery Lanes in Redwood City, California, sold us several worn out target butts. From these we were able to salvage enough good pieces of cardboard to make the finished product. The pieces that were too

far gone were discarded. The rest were laminated and compressed securely with an apparatus which we were able to rent from the local hardware store. The tool shown is a bander, simple to use and there is little or no waste at all.

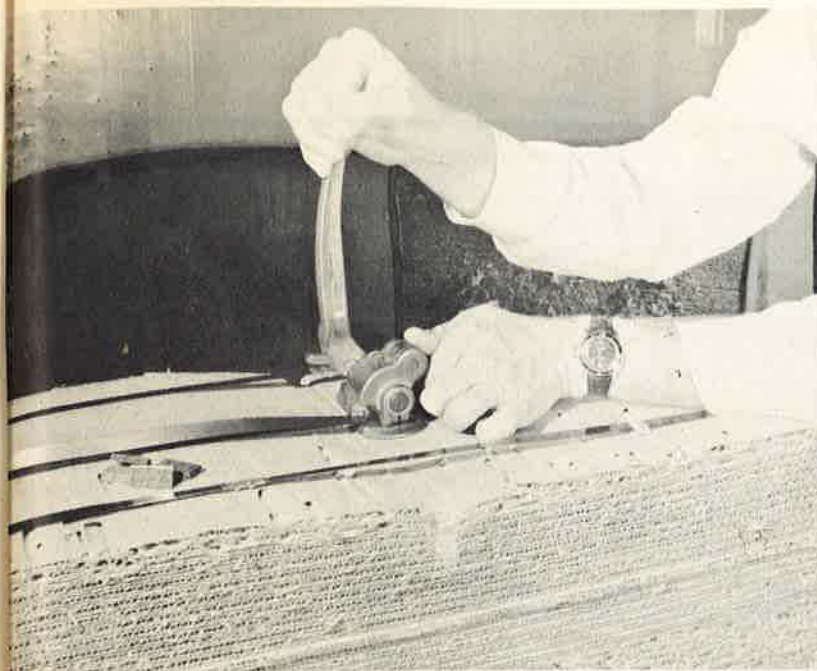
After securely banding the laminates of cardboard, we covered it with burlap purchased from the same hardware store. Several six penny nails driven into the sides was all that was required to hold the burlap in place.

The only thing left was the target, itself. Almost anything can be used to fasten the target to the butt. We found that pull nails worked best. When driven into the butts to the head, they still protrude far enough to be pulled out with ease and used time and time again.

A target butt such as this will last from a month to a year, depending upon the use it gets. I have found the average life to be about two and a half months, but I only practice for about one hour a day.



Used target butts from an indoor range provide material.

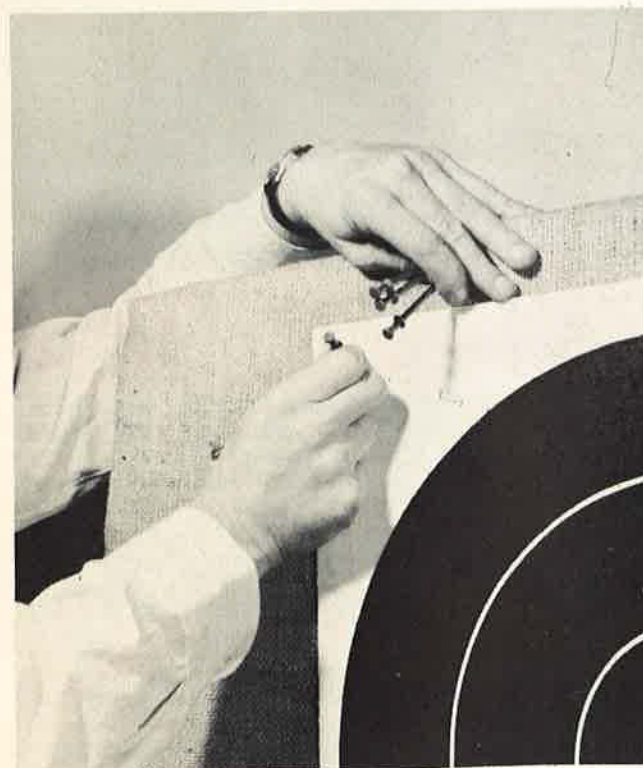


Cardboard laminates are held, compressed by steel bands.



A fastener is applied to the bands to hold together.

These "pull" nails are used to hold the target in place.



Finished product provides effective, inexpensive butts.



... AS A
SHOOTING
HOUSEWIFE,
SHE
RAISES
KIDS —
AND
TOURNAMENT
SCORES!

By Joe Higgins



If a forty-year-old Huron, Ohio, woman, one Mildred Zimmerman by name, were asked to describe her occupation on a form, it would be:
"Housewife and mother."

That in itself is quite an accomplishment, for it's MRS. Zimmerman, and she has a husband, George, and four children, Kay, 17, John, 16, Jim, 14, and Larry eight, to care for.

Taking care of a husband, children and home is a full time job for any woman, but some are exceptional.

There's no question but what Mrs. Zimmerman falls into this category, for in addition to her role as "housewife and mother," she happens to be the National Field Archery Association's Women's Free Style Champion of the United States!

Her start in archery is based, to some extent, upon her interest in her husband's activities; he began shooting ten years ago and she became intrigued with the sport. So she adopted it, practiced, became adept in the use of the bow — and then some happy news came along and she stopped. Larry was on his way and it is quite obvious that pregnancy and archery are

a difficult combination. Further, with a small boy and other children in the house, motherhood and archery don't quite hit it off and Mrs. Zimmerman is not the kind of a woman to borrow time from basic and essential duties.

But children, happily, have the inevitable tendency of growing up and about a year and one half ago, Mrs. Zimmerman realized that she had time on her hands. The archery spark had not died and back she went into the sport.

Her move was productive; under coaching from her husband, George, a member of the Professional Archers' Association, and a man who placed third in the instinctive division at the Nationals in Arkansas in 1962, her natural abilities hit their stride and she placed eighth in the 1964 Ben Pearson Open Tournament at Detroit, with scores of 782-761.

No one was happier than her husband and just as enthusiastic were her sons, Jim and John, who have taken Ohio State instinctive intermediate honors. John has been the Ohio instinctive intermediate champion for the past two years. It goes even further —

Profile Of A Champ:

Mildred Zimmerman.....

Gil Boenig, president of the NFAA, presents Mildred Zimmerman with her championship trophy following annual shootout for 1964, which was held at Watkins Glen, N.Y.



she and her husband and the children are members of the Bellevue Archery Club of Bellevue, Ohio. While Kay has evidenced an interest in the sport, she is not an avid follower. But eight-year-old Larry is cut from the archery mold; he now owns his own bow and shoots with the family.

"And," says Mrs. Zimmerman fondly, "he's showing a lot of promise for such a youngster."

Husband George is employed by the Standard Oil Company in Huron, shoots frequently with — and against his wife.

"At first," says Mrs. Zimmerman, "he was charitable. He used to give me handicaps of several hundred points." But the handicap is growing smaller as her skill increases and it may be nip and tuck from now on.

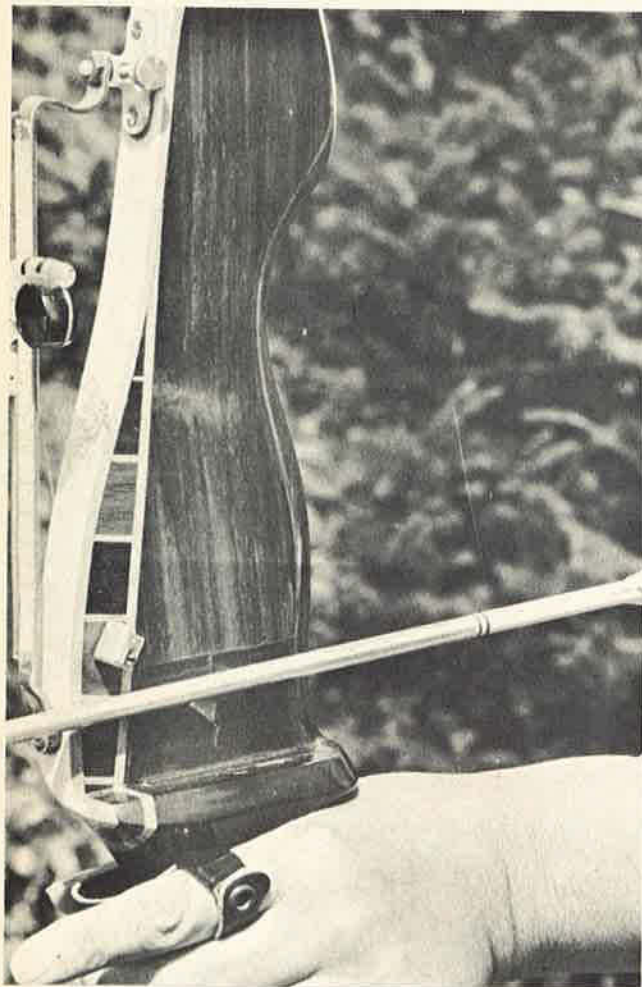
Both use a Hitt Black Ace bow. Both work with sights now. Mrs. Zimmerman's choice is a 68-inch, 30 pounds at 28 inches, and her arrows are Easton 1616 (three-fletch spiral), 27½ inches long. She uses a Scram Sight with pin, mirror, draw check and bubble level on the hood. These, plus a natural grace of movement and outstanding physical co-ordination, constitute championship caliber.



Line drawing illustrates the form, developed over her years of archery, with which she won her current title.



Above: This winner receives congratulations from husband, George, and three sons, John, Jim and Larry at the end of the course. (Below) Mrs. Zimmerman's Hitt Black Ace bow is equipped with a level, Schram sight with pin and a mirror. She shoots Easton aluminum arrow at 28 inches.



Her championship win was a close one, for she won by one point over Carolyn Johnson of Arkansas at the tourney at Watkins Glen, New York. But that one point was enough, for it equals a yard for distance runners, a second for a dash man, a foot for a discus thrower, a nose for a jockey.

Both women actually wound up with a tied score, but the contest was awarded to Mildred on the basis that she had the highest twenty-eight field round, and the award was made according to National rules.

All winners, all champions, have positive thoughts on what helped them make the grade. Mildred prac-

tices a great deal when time affords and she credits those hours. In the recent past, she has been able to shoot at last three nights a week with her husband, and plans on continuing this kind of schedule, even with the advent of cold weather.

"There are more and more indoor ranges coming into existence in this area," she explains, "and we'll probably be able to shoot the year 'round."

Along with practice, she reads archery books a great deal, and feels she has absorbed many helpful shooting hints from this reading, all of which she puts to good use in her practice and competitive sessions.

No champion merely breezes through competition without some trouble. She had a bad moment in the Nationals, as she recalls. And it was the kind of trouble that could visit any archer; it occurred on the forty-five-yard target during the rain storm on the last fourteen of the field round.

She drew carefully, sighted — and blanked the target. Understandably she "felt very bad about it." Her final score in the Nationals: Field, 454-412, for 866; Hunter, 448-457, for 905, and Animal, 488. Total: 2,259.

The new champion reacts well under pressure, but predicts she may run into trouble as time goes on. Competitive pressure never bothered her up to the Nationals.

"But," she explains, "now the situation is a bit different. Once you've won a major title, a lot of folks expect you to continue winning. And this applies even to your own thinking; you can't quite eliminate the feeling that you should be doing your top shooting constantly, and this is where the pressure will come into the picture. It hasn't affected my shooting so far, and I don't expect it will, but it's going to be something to fight."

Strictly a target archer so far, Mildred has not done any hunting — although, she says, "George and the boys go for that end of the sport." Her husband and John and Jim all got a deer last year, and were planning to equal that record this season.

The new champion has come a long way in a comparatively short time and it hasn't been an easy road. Probably her greatest problem in starting the sport was in judgment of distances. She still hasn't surmounted it yet, and distance marking by stakes has helped a great deal.

"I was pretty discouraged at first," she recalls, "but I learned one good thing from shooting — don't let a problem discourage you. I don't think I can emphasize that enough for the beginner — discouragement kills incentive and enthusiasm, and it has no place in archery. I know the phrase is old and time-worn, but it's fitting — you've got to crawl before you can walk and you've got to walk before you can run. Archery is like that. With a good bow, with good arrows and other equipment, you're ready for improvement, and if you've got the makings, practice and more practice will do the rest."

"I get tips from reading and observation of other archers, but I also have received a lot of help from just plain listening. During the years when I wasn't shooting, I'd be with George a great deal of the time when he sat with his archer-companions. And they'd talk. And I'd listen. You'd be surprised how much you can learn just by being observant and a good listener."

Eventually, Mrs. Zimmerman hopes to compete in money tournaments against both women and men. One such is conducted at the Bow'n Arrow Archery Center at Lorraine, Ohio.

And when this occurs, the "housewife, mother — and National Champion" — will be right in her element. For after all, shooting against men will be no new experience. Aren't there four in her family who have fired her incentive and tempered her experience? •



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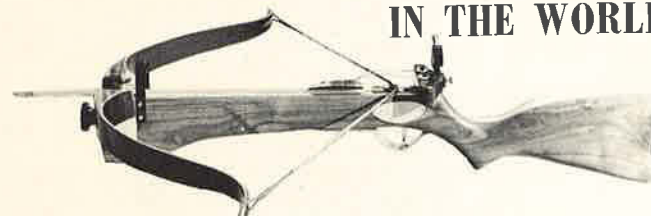
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TACKLE TIPS

(Continued from page 13)



Using the Trajectrocaster, which releases the arrows automatically to avoid possible human error, author shot this typical six-arrow group at measured 180-yard range.

still day to get any honest and constructive results from our testing.

The following day, we again went to the basin and it was an absolutely beautiful deadstill day, perfect for testing. We again shot twelve test arrows, alternating between the helical fletch and the straight clamp angle fletch so that if there were any increase or decrease of air movement during the time it took us to shoot the twelve arrows, we would get a better average.

Harry was watching with the binoculars and he said, "Boy, they're all hitting on top of each other!"

We went out and as we got closer to the group with the naked eye, it did look like they were all sitting in one small group about a foot in diameter. However, the left and right spread was about a foot and a half but the lengthwise spread was eight or nine feet. The arrows that were fletched with the straight clamp at the slight angle were consistently ahead of the ones that were fletched with the helical. However, the difference between the center or average of the two groups was only about four feet. Now when you consider four feet in a distance of a hundred and eighty yards, you are talking about a small percentage difference in performance. We went back again and shot another group of twelve arrows while we still enjoyed the very still weather. This time we got a similar group and to further the accuracy of the test, we pulled the long and short arrow out of each of the different fletchings and then averaged the remaining four. Again, we got a difference of three or four feet. Then we decided we would drop the angle down to about fifteen degrees so as not to have the arrow travel so far up into the air, reasoning that we would have less disturbance of the arrow through air movement. This time we again had a similar performance except everything was tightened up. The width of the group was about six inches and the overall string was about four feet. The difference, again, was in favor of the straight clamp angle fletch. This time the difference between the two groups was only about two feet. All told, we shot four groups of twelve arrows each. In all instances the straight clamp fletch went slightly further than the helical.

In summation, I would like to say this. It is easy to see why there is a large controversy between archers as to which flies the flattest, the helical or the straight clamp angle fletch. There is so little difference between the per-

formance of these two types of fletching that there is no man alive who could shoot well enough to tell the difference. (This statement applies only to the two sets of arrows that we were testing. It is possible to fletch arrows so different that the average archer can readily tell the difference.) In the case of our test arrows, you would have to find an archer that could shoot less than an eight-foot group at 180 yards to prove the difference between these two sets of arrows. Now if an archer was capable of this, he could shoot a perfect clout round and nobody yet has done this.

After doing the practical tests, I had to find out why the helical went slightly less than the straight fletching. Consulting several eminent engineers on the subject, I came up with the following conclusions. The slight loss of distance on the helical was caused by increased frontal area.

Frontal area in the jargon of the design engineer is any surface that you can see when looking directly along the travel line of the missile or object. Frankly, I expected to encounter a lot more difference between the two fletchings and I asked these engineers why there wasn't a larger amount of difference, as the frontal area on the helical was considerably more than the frontal area on the straight clamp angle fletch. An arrow travels approximately 180 feet per second, and at these lower velocities, frontal area isn't as important as if, say, the arrow was travelling 3000 feet per second as a bullet does. Then an increase in frontal area to the extent of the difference between the helical fletching and the straight clamp angle fletch on our test arrows would make a very large difference. As far as accuracy went, I could see no appreciable amount of difference between the helical and the straight clamp angle fletch.

Whether you shoot helical or straight clamp angle fletching is a matter of personal preference. As far as a practical difference in performance, we could find none. ●



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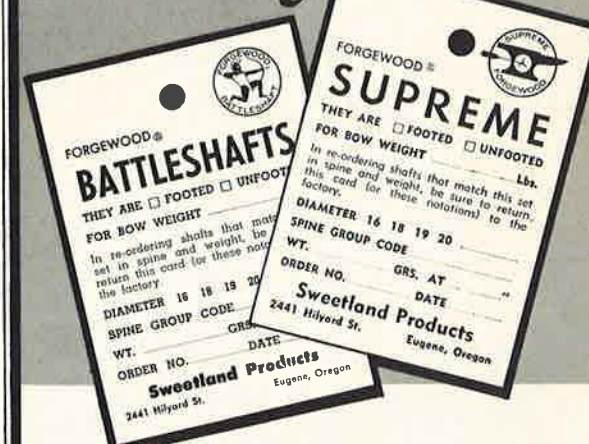
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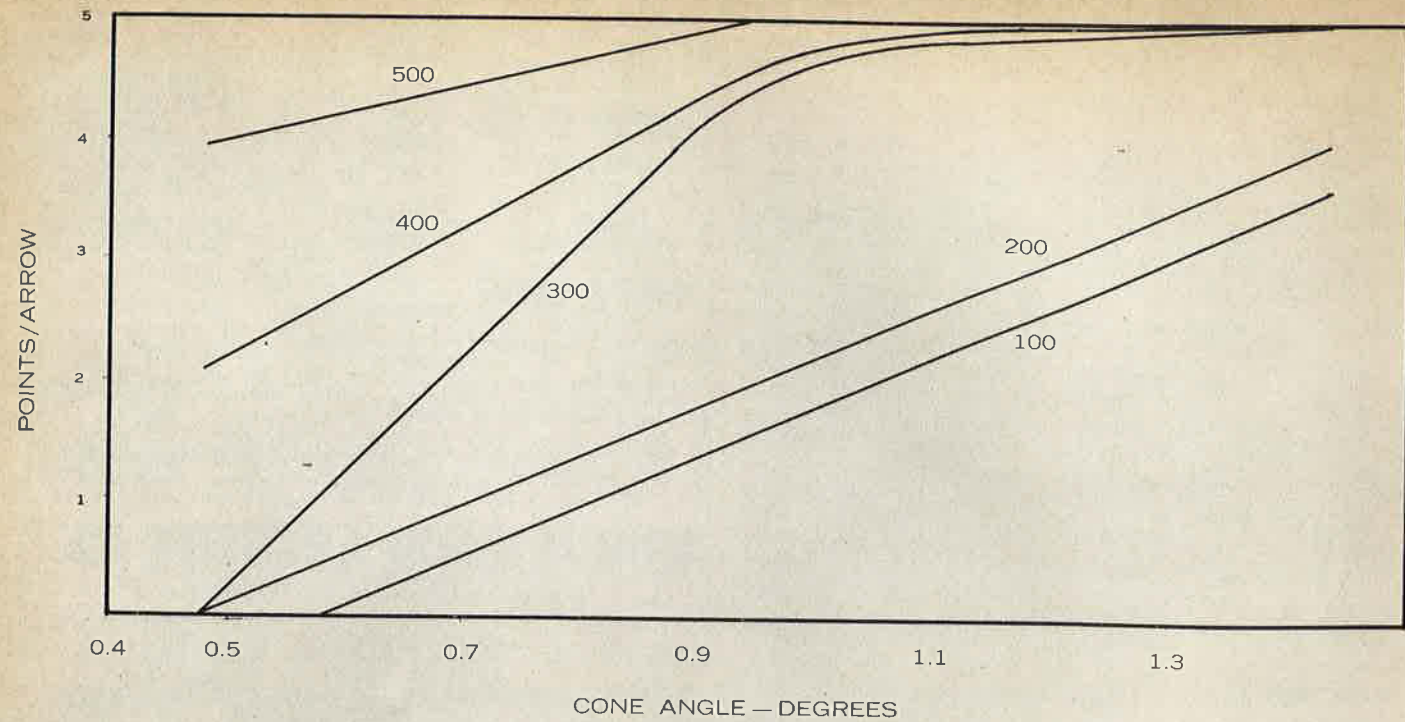
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Archer's Score Versus Cone Angles

By James R. Moser

Here Is Practical Knowledge That Can Improve Your Shooting!

James Moser has a B.S. degree in chemistry with minors in physics and mathematics from Wilkes College, Pennsylvania. He subsequently obtained a master's degree in physical chemistry from Alfred University in New York and is presently employed by Pratt & Whitney Aircraft in East Hartford, Connecticut, as a research chemist in electrochemistry.

In a recent issue of BOW & ARROW an article was presented entitled, *The Hardest Field Target to Hit* written by Robert A. Ghelardi. While reading through this fine summary of cone angles, several points came to my mind which I thought might be interesting to put to the test of experiment.

The one question that I had was, "Do archers statistically obtain less score on smaller cone angle shots?" To test this point I was fortunate to obtain all the score cards from the New England Free-

style Championship Tournament held in Columbia, Connecticut. From these cards, a sufficient cross-section of scores was available to perform a statistical analysis on the score obtained at various cone angles.

After spending considerable time at calculations, it was found that by plotting the average points per arrow at a specific cone angle against the cone angle, rather characteristic curves began to evolve. By interpolating the many curves that were available, it was possible to arrive at the representative curve shown herein.

It is of importance to point out that all these curves have been derived from actual shooting scores and not obtained by theoretical means. The theoretical analysis of R. Ghelardi is being tested in practice.

Looking at the curve, it can be seen that, indeed, all archers do have more difficulty in hitting the small cone angle targets. At the same time, it can be seen that archers shooting less than 300 also have considerable difficulty in scoring high on targets with cone angles

greater than 0.9 degrees. So, you archers in this scoring range, get busy practicing on the bunny, 15, 20 and 35 yard shots and your score will increase rapidly to push you into the 250 class.

After approaching the 300 mark, then it becomes necessary to concentrate more heavily on the other targets to increase your score. This procedure of working on the larger cone angle targets has a second beneficial effect on an archer: The archer has a chance to greatly improve his form and become easily familiar with his equipment. By improving one's form it becomes much easier to score on those longer shots.

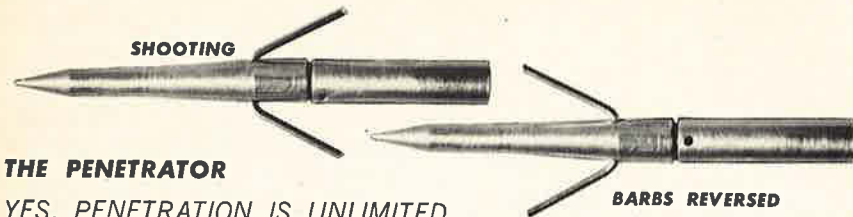
These curves not only apply to free-style archers but also to instinctive archers. Both types of shooting have been examined and no statistical difference is apparent. This is not unexpected since the curve shape is indicative of the quality of the archer and not of his method of shooting.

In explanation, the inscribed numbers on the graph are the score that one would have after shooting twenty-eight field targets.



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MAIL POUCH (Continued from page 6)

NOVICE TO SPORT

Although you have been complimented many times by those who have found your magazine terrific, I would like to add my compliments. I think your magazine is a credit to all archers and the novice like me.

Your second edition was the first of BOW & ARROW that I picked up. Since, I have asked the storekeeper to save each issue as it comes in so I don't miss any.

This magazine has gotten me interested in archery so that I now am saving for my own tackle. It has given me a few important tips on choosing the right and suitable tackle.

John Bouchard,
Hamilton, Ont. Canada

(Why not buy a subscription? Then you won't have to but your storekeeper.)

CROSSBOWMAN

I am compelled to compliment you on the splendid job you are doing with BOW & ARROW. Your magazine gives total and honest coverage to all phases of archery without prejudice.

Having been a crossbowman for many years, I can truthfully say that your magazine is the only one that has ever given as much space to the crossbow or treated it as a vital forbearer of modern archery.

As a crossbowman, I have been denied membership in archery clubs, have been charged excessive target fees when admitted, have been promised substantial coverage or space in so-called archery publications and never saw it materialize after many subscriptions were obtained.

I have seen the crossbow banned as a hunting weapon in many states and the reasons given by some of the State Game Commissions were absurd, bordering on the ridiculous.

If the present policy of your magazine continues, it can do much to correct the many myths and false impressions connected with the crossbow. Perhaps, one day, longbowmen will stop fighting the battle of Crecy and learn what really did happen there!

The articles by Colonel Rankin and Tommy Bish have been especially fine.

Larry Valentine,
Johnstown, Pennsylvania

(We're confused, admittedly. What really did happen at the Battle of Crecy? As for coverage, B&A will continue to cover whatever stories we feel are of interest to readers — without prejudice.)

LEGAL SECTION

After reading your recent issue, I noticed an article on crossbows. I have been wanting one for a long time and was wondering if they are legal in California. I live in an area that has rabbits galore, and would it be legal to shoot them with a crossbow? I was planning on getting a 45-pound bow.

L. Allen,
Duarte, California

(Crossbows are legal to own and use in the State of California, but there could be individual city restrictions. We'd suggest you check your city police department for the regulations. This state does prohibit the use of crossbow for hunting any "game" animal such as deer, cottontail rabbit, etc., but they may be used for hunting any non-game animal such as predator — including coyote, fox, bobcat — jackrabbit, ground squirrel et al.)

CROSS BOW BUILDER

I want to try and build myself a crossbow. I would like to know how the length of the string is figured and how the draw in inches is determined. I'm planning on using a 20 or 22-inch bow, or slightly longer; and on a pistol-type crossbow, about a 12 or 14-inch bow — or slightly longer.

Could you explain how these are figured; the length of the string and the length of draw each will use, recommending the length of a bolt that I could use?

Eugene S. Watters,
El Paso, Texas

(The easiest method might be to order a set of plans from the National Crossbow Association. They have such sets at \$5 per.

(Without knowing the material and design of the particular bow, it is impossible to advise the draw length. With short bows such as you describe, you will only be able to draw them a few inches: About seven inches with the 22-inch and about five with the shorter 12-inch model. Length of the string will be two to three inches shorter than the bow. Bolts of 8 to 12 inches should be satisfactory, depending upon the length of the bow.)

WHERE IS IT?

I and several friends here in central Ohio are interested in archery primarily from the hunting standpoint and are looking for happy hunting grounds.

I read an article somewhere sometime ago about a state-owned game preserve which is open only to archers; no guns. It seems to me this was either in Kentucky, Tennessee, the Carolinas, or even Georgia. As I recall, they have deer,

(Continued on page 51)

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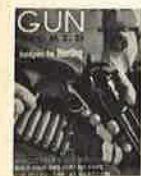


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THE DANGEROUS CLARK GANG!

IF YOU
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WITH THIS
FAMILY,
BE PREPARED!

On the premise that one never is too old to learn, Jack Clark works with daughter, Debbie, to improve anchor.

Right: The entire family was excited when a story on Dave Keagey, Jr., appeared in a recent issue of BOW & ARROW. Keagey and Debbie represented the U.S. in the World Championship Archery Tournament in Finland. From left are: Debbie, Diane, Sherry, Ann.



By Jack Lewis

FOR the Clarks of Cincinnati, an evening at home is not simply watching television, reading a good book or even relaxing. Instead, it's archery all the way. Over the years, the Clarks — Jack, Ann and daughter Debbie — have won nearly every major archery title and a good many non-major crowns. Needless to say, perhaps, this didn't just happen. Instead, it has been a matter of working together, helping each other over the hurdles of form and attitude — and living archery together.

Each of these members of the Clark family is an expert in his own right and each is known throughout the archery world for his or her ability. When a new title is acquired by the Clarks, a new trophy added to the collection, it is shared by all and each one feels he has contributed to the achievement.

While Jack and Ann Clark are well known as frequent competitors and champions, it is Debbie who has become the subject of their interest. Jack Clark, for example, has been an archer since 1952 and became qualified as a professional in 1960. In fact, he has served as vice-president of the Professional Archers Association. In 1963, he was the National Indoor Flint Round champion, and he never has placed lower than fifth in any national competition in which he has been entered.

Ann Clark also has a lengthy record of wins. She

was the National Target champion in 1955 and again in 1960 and holder of the high aggregate record. In 1957, she was a member of the U.S. FITA team in Prague, placing second in that event. This, incidentally, was the first time that both men and women representing this country placed first, second and third to take the team titles. And in 1961, she was the National Field Archery champ in the free style event.

As a freshman in high school, Debbie Clark followed in her mother's footsteps in 1963, when she qualified as a member of the United States FITA team, and competed against other nations' top archers in Helsinki, Finland.

But as suggested, this sort of thing didn't just happen for seventeen-year-old Debbie. To start with, she wasn't exactly weaned on a bowstring, but she did start shooting when she was only eight years old.

That sort of early training gave her the basis for becoming the Junior National champion for three successive years, from 1959 through 1961. In those same years, she won city and state championships for Cincinnati and Ohio respectively. In 1962, she left the junior ranks and went up against women archers who were older and more experienced than she. That year, she won the Senior Women's Amateur championship for the Brown County (Ohio) Open; the Senior Women's Amateur City crown in Cincinnati, which might well be considered the most archery happy town in the nation, then placed third in the Senior Women's National Target championships.

In 1963, the brown-haired lovely, who looks as much like a female Robin Hood as I look like Maid Marian, came into her own. In addition to placing high in the FITA finals in Helsinki, she started off the year by



Constant practice, even during family campouts, has helped the Clark offsprings to develop a fine edge. Diane (left) matches her marksmanship against sixteen year old Debbie.

Below: At the National Indoor Tourney held in Indianapolis in 1963, Jack Clark won the pro championship with 526, Debbie amateur crown with 523.



Photos By Chuck Elliott, Milt Lewis and John Horton

Ann Clark congratulates daughter, Debbie, after youngster won women's amateur title in 1963 Pearson Open.



As professional archers, both Ann and Jack Clark were big money winners in First Annual National Indoor Championships held in California in early 1963. Ann won second in women's scratch singles; her husband placed third in men's version of the same event. Bob Hendreckson, then president of AIAA, presents the pair with their checks.

winning the Senior Women's City and State Indoor Chicago Round in the amateur category, taking the Senior Women's amateur title for the National Indoor Flint competition. In 1963, she won the Women's Amateur championship in the Ben Pearson Open, then went on to become the youngest member of the FITA team at only fifteen years of age, placing tenth in the international contest in Helsinki.

Debbie, according to mother Ann, has done little in the way of competitive shooting in the past year due to an extended illness. In fact, the entire family has been in a state of semi-retirement during 1964. However, since New Year's Day, the practice sessions have been resumed with the hope that Debbie again will qualify for the bi-annual FITA contest, which will be



held this year in Sweden. She also will attempt to repeat her 1963 win in the Ben Pearson Open, when it is held in Detroit in April.

As might be expected, too, thoughts of a career and becoming an adult have had their effect. Debbie is considering a career in nursing, and instead of hitting the tournament trail during 1964, she attended summer school, taking special courses which would help her in nursing studies. She also has, at this writing, become one of five nominees in a school of 1200 girls for the post of Cincinnati's Mayor for a Day. And utilizing some of the poise that she has gained through archery, she has become interested in dramatics and was chosen from 150 candidates for the female lead in a local play.

But with the hope of again making the FITA team and representing the United States in 1965, it has been back to the target grind in recent weeks. She has been practicing at local indoor lanes some three nights a week during the winter months, and as tournament time draws closer, she will up this practice to a schedule of three to five hours per day.

Jack Clark serves as Debbie's coach — as well as Ann's — and a curious innovation is used in studying technique. The Clarks have adopted the technique used by college and professional football coaches and take slow motion movies of Debbie's shooting style, then study these at their leisure. This gives the entire family an opportunity to observe for any bad shooting habits that may have been picked up. Jack Clark's watchful eye invariably picks out the trouble area and careful supervision is maintained to solve the particular problem.

When Debbie first entered competition in 1959, she was using a sixteen-pound bow with nineteen-inch aluminum arrows. Today, she uses a sixty-four-inch twenty-four-pound working recurve laminated model and twenty-four-inch aluminum arrows. Because of her amateur status, no mention may be made of the trade names involved, but she uses this same bow for all rounds.

When asked what she considers the toughest contest in which she has ever shot, Debbie works on the philosophy that all competition is rough. She deliberately shoots in tournaments in which she knows she will be up against top archers; this was her reason for entering the senior women's classes at such an early age. As Ann Clark aptly puts it, "She has found that there is only one person she cannot beat and that is herself."

For the present, Debbie wants to continue to maintain her amateur standing, but she makes it



Even in her recent adolescence, Debbie Clark displayed a form similar to that of her top-rated parents. (Below) In the Clark home, an idea of an evening together is to sit around the table and fletch arrows for next tourney.



hand. As expressed earlier, when most families may be gathered about the television set, the Clarks spend many a long winter evening in fletching areas around the kitchen table or getting their equipment in shape for the coming tournament season. As is the case with most competition archers, Debbie's arrows are fletched with plastic vanes rather than feathers, using only one jig.

There is the possibility, of course, that the youthful Debbie might eventually outstrip both of her parents in the matter of trophies and crowns, but there is certainly no jealousy involved here. As Ann puts it, "Debbie's wins thus far are certainly a tribute to her father, since he spends far more time in teaching us than he does in his own practice."

Both Jack and Ann also are accomplished bow-hunters and have taken their share of deer during legal bow and arrow hunting seasons. To date, this is a facet of archery in which daughter Debbie has shown no great interest. She seems much more content in putting her arrows in the gold to add to the family's collection of trophies which are on prominent display in their home.

But what of the other Clarks? There are two more daughters, Sherry, 19, and Dianne, who is 18. Both of these daughters have been interested in archery, of course, but Sherry now is Mrs. Terry Meyer and lives in Seal Beach, California, where she has interested her husband in archery. There may yet be another top competitor attached to the Clark Clan. Dianne, who also has spent her share of time on the range, is perhaps best described by her mother, as having entered the age where she is "more interested in beaux than in bows."●

known that she eventually would like to follow in the footsteps of her mother and father, going on to become a top pro in the Professional Archers Association. She has expressed a growing interest in the entertainment archery field and has developed an act which incorporates precision and trick shooting which has caused her to be in demand among service clubs and other organizations in the Cincinnati area.

As for equipment, her arrows are fletched by her mother and father with Debbie offering a helping

MAIL POUCH

(Continued from page 45)

black bear, turkey and wild boar.

But now I can't find that article. If anyone can put us on the right track, we'll be grateful.

William J. Sulceberger,
Greenfield, Ohio

FAMILY MAN

I found your magazine interesting and informative. I have enjoyed the sport of archery for many years and my son has also been interested. Both of us enjoyed quite a number of days afield with our bows and arrows this past hunting season. Next season I'll have two additional members of my family in the archery fraternity, but not to hunt. They'll start on targets — they should be able to pull a 20-pound bow by fall: A set of twins, age 10!

Ted Groszkiewicz,
Marietta, Georgia

CANADIAN OUTLOOK

I feel that this magazine is one of the greatest promoters of archery that the sport has received and given to the general public who are not receiving the regular archery magazines and have nothing to cultivate a growing interest.

Thomas Mack,
Trans-Canadian Archery Sales,
Hamilton, Ont., Canada

(That is one of the basic aims of BOW & ARROW: To bring new blood into archery, and the only way this can be accomplished is through a newsstand publication such as ours.)

ARROW MATCH

Does one tell by the weight of the arrow if the arrow matches with the other arrows one has? If not, how can you find out if his arrows match?

What does under-spined and over-spined mean, and how can one tell if his arrow is either?

Bob Irmen,
Cathay, North Dakota

(Normally, arrows are matched by both physical weight and spine: Stiffness of the shaft. The less costly arrows are sometimes matched for spine only. How close the arrows match in these specifications reflects the cost involved.)

(An arrow too stiff is over-spined. The degree of spine can be told with a Spinometer, available at any archery supply house. The recommended spine depends upon several variables: Bow weight, arrow length and the weight of the head used. Recommendations for your particular specifications can be had at any archery dealer, assuming he is proficiently cognizant of the products he sells.)●



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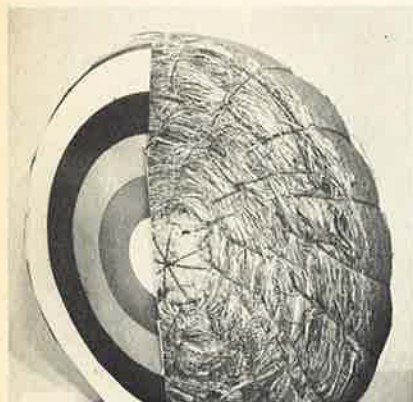
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BOW BITS



STRENGTHENED TARGET

A new Johnson grass target with an improved center core of wood excelsior for longer life, more target wear has been introduced by Ben Pearson, Incorporated.

According to Walter Maupin of the firm, "This new Johnson grass target was designed to add tournament quality to an economical target. Shooters may expect to get a longer lasting target for their money, as it is strengthened at the most vulnerable point: The center core."

The targets are available in three models: The No. 408 is forty-eight inches in diameter with a ten-inch core; the No. 406 is three-feet in diameter with an eight-inch core, while No. 404 is twenty-four inches across with a six-inch core.

For full information, write to Ben Pearson, Incorporated, (Dept. BA), Pine Bluff, Arkansas.



HUNTER'S TREE STAND

Albert Janwich up New Jersey way has been telling us about his new tree stand that he says can be installed above the line of sight and smell of your deer or other quarry. Then, if you don't get air sick, all you have to do is wait them out. We won't even mention what happens if you accidentally fall asleep.

This platform folds into a small six-pound package, since it is of aluminum construction, and according to the maker, it can be installed in less than a minute.

For the seat and one step, it sells for \$29.95 postpaid. If you want additional steps, they're \$3.25. To order, write to Tree Stand Company, (Dept. GW), 23 Main Street, Matawan, New Jersey.



STABILIZING GRIP

A new type of handle, termed a Stabilizing Grip because of its claimed ability to keep a bow steady in the archer's hand, is now included among the top line bows of Darton, Incorporated.

This grip is achieved in the manufacturing process, thus giving the directional action wanted by archers without the necessity of added weights and other devices. According to Ralph Darlington, Darton's president, "We are adding this feature on all of our bows starting with the *Classic* model at no added charge. On the *Electra* and *Thunderbird* models, this stabilizer grip will be checkered."

Full details are available from Darton, Incorporated, 3261 Flushing Road, Flint, Michigan.

FIRST FOR INGLEWOOD

What is probably the first city-sponsored automatic archery installation is now in operation at Centinela Park in Inglewood, California.

Don White, who has been designated as range master, reports heavy attendance at the indoor installation. Thus far, hundreds of youngsters have utilized the ranges instituted by the City of Inglewood.



FOLDING BUCK KNIFE

A quality folding knife weighing six ounces with a four-inch blade is being introduced by Buck Knives, known until now for their hunting blades.

When folded, the new model measures 4 $\frac{3}{4}$ inches. The handle, fashioned for hand fit, is of golden-grained Macassar ebony imported from Indonesia. The knife comes in a leather sheath with flap and may be carried on the belt.

Double spring construction insures positive lock to prevent the blade from closing when open. Known as the firm's Model 110, the knife will not corrode or rust and the hand-tempered blade of high carbon content incorporates the features of other Buck models. It sells for \$16 with the sheath. For information, contact Buck Knives, Inc., (Dept. GW), 6588 Federal Boulevard, San Diego, California, 92114.

PEARSON LOOT SHOOT

This year's Ben Pearson Open Tournament, the seventh shooting of the annual event, is slated for April 10-11, with the prizes being boosted to a healthy \$12,000.

As in several seasons past, the tourney will be held in Detroit, Michigan, at Cobo Hall. The round that will be shot will be the same Official Professional Archers Association face — sixteen inches — that has been used in past contests. The PAA, according to Jack Witt of the Pearson menage, has come up with an official round which will be adopted for the open. This round is shot at twenty yards with twelve ends, divided into three games of four ends each. In each end, only five arrows will be shot. The scor-

ing for this round is — from the center of the targets — 5-4-3-2-1. This makes each end with a perfect score count twenty-five points. Each game of four ending with a perfect score thus will count a hundred points, and each complete round of three games would have a perfect score of three hundred points.

"We are also going back to something used in the first Pearson Open," Witt added, "because of many requests. In the team event, the teams will shoot on the same target together, and all teams will shoot a PAA round together on Saturday, another PAA round on Sunday."

He said that some 1,300 archers are expected to compete in the tournament.

BIKE TRAILER

A new trailer for hauling your bike to where the trail begins is being introduced. The transport is compact, lightweight and boasts a carrying capacity of eight hundred pounds.

A loading ramp attaches to the rear of the trailer, and after loading, the ramp can be stored on the tongue of the trailer. Straps tie down the front wheel of the bike. All along the track, there are tie-down cleats to assure that the bike is held securely.

Price on the rig is around \$225, and full info is available from American Trailer and Manufacturing Company, Dept. GW, 12222 South Woodruff Avenue, Downey, California.



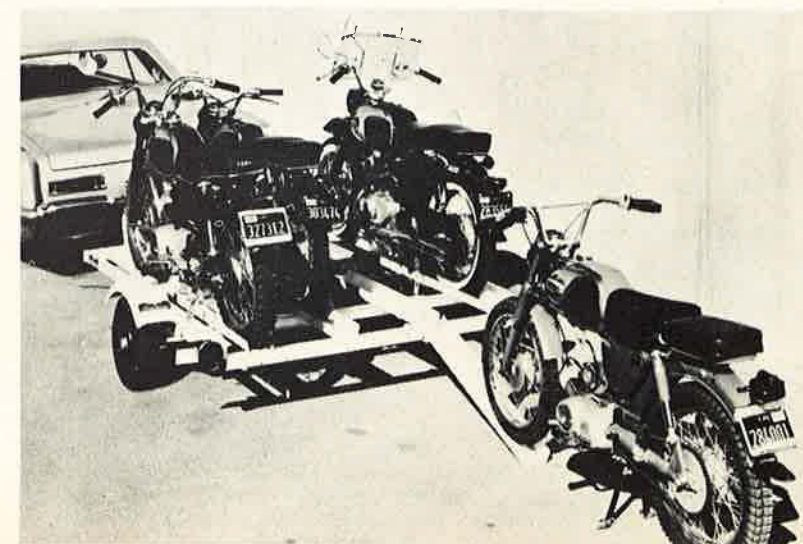
HOYT CATALOG

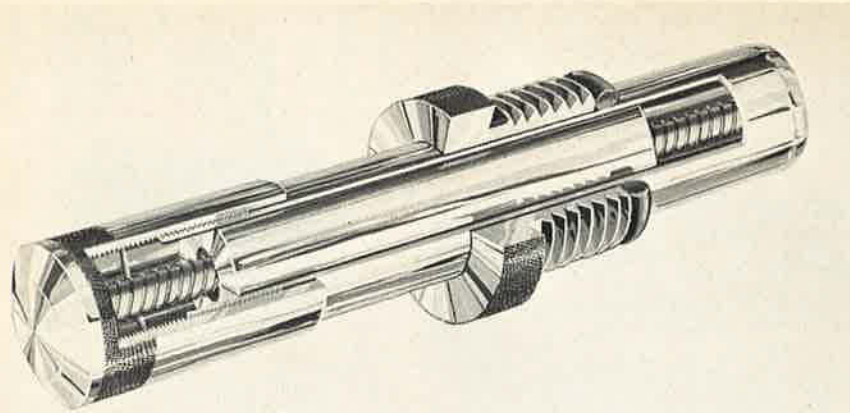
In a new color catalog, in addition to the full line of Hoyt bows and arrows, the firm's hundreds of other archers accessories are displayed. Top of the new line of five Hoyt bows, the *Pro Medalist*, is featured. This new bow has removable torque stabilizers and has a unique built-in adjustable rest, called the *Micro-Rest*.

This precision-made arrow rest allows the archer to dial the infinite degree of center shot best suited to his individual technique. According to Earl Hoyt, Jr., "The adjustable rest provides the arrow clearance needed to realize the ultimate potential of torque stabilization and high velocity shooting. With the higher scores shot today, and the ever-increasing competition in tournaments, the need for precision adjustment for exact degree of center shot has become vital."

Other Hoyt bows featured in the catalog include the new *Pro Custom* designed in bubinga and rosewood; the improved *Pro Hunter* with full thumb rest pistol grip and many others in all price ranges.

The catalog is available at dealers or by writing Hoyt Archery Company, (Dept. BA), 11510 Natural Bridge Road, Bridgeton, Missouri, 63044.





HOWATT'S LATEST

This artist's cutaway conception illustrates the intricate workings of Howatt Archery's latest development, what is called a "variable thrust compensator." This unit is meant to permit the adjustment of feel, action and balance in a bow to the archer's personal requirements.

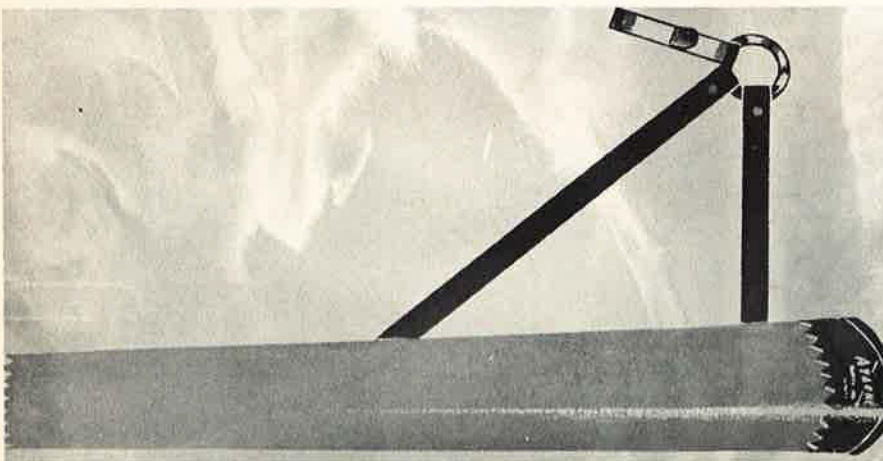
A new bow, the Matador, in 66 and 70-inch lengths has been designed to accommodate two of these VTC units. This new bow, with the mechanisms included, will be available from Howatt early this year. But if you're in a rush to know more, write to Howatt Archery Manufacturing Company, Route 8, Yakima, Washington.



DISTANCE MEASUREMENT

When time, terrain or circumstances prevent range measurement, there is now a pocket-size instrument to do the job. Distances from 40 to 500 feet can be read directly off the scale of the *Rangefinder*, using a six-foot reference height.

This item is made of durable plastic and sells for \$2.98. Further information on this compact measurer is available by writing Vexilar Engineering Company, Dept. BA, Box 6286, Minneapolis, Minnesota, 55424.



APACHE QUIVER

The new Kolpin extra-heavy T-13 Apache green-camouflaged belt quiver is now being introduced. This quiver is of waterproof vinyl leatherette with a molded leather bottom. It comes equipped with a

leather strap and a metal belt clip and is priced at \$2.49.

It is available from Kolpin Brothers Company, Incorporated, Dept. BA, Berlin, Wisconsin. And upon request, they will send you, too, their new catalog of archery accessories.

NEW INDOOR FACE.

A new indoor round to supplement the Flint round now is available to clubs, according to Chuck Saunders of Saunders Archery Target Company. The first printing of this new face, developed by the National Field Archery Association and Saunders, is an experimental run. Changes will be incorporated as club reports and comments come in.

NFAA and Saunders, on the theory that a miss is not fun, made the indoor face big enough "so the novice can score most of the time." New color combinations brighten the target to get away from the somber black-and-white face.

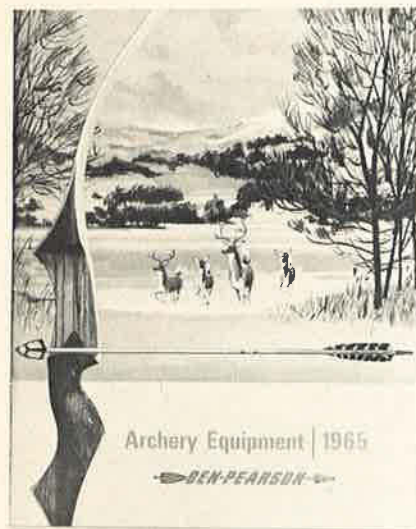
To encourage clubs to try the new target, NFAA and Saunders are absorbing part of the production cost, making them available at four cents each. Clubs are urged to try this new round and report back quickly so that changes can be made. The new face can be ordered directly from Saunders Archery Company, Columbus, Nebraska, but include fifty cents for handling and mailing costs.



SPORTSMAN COMPASS

This compass has a so-called "built-in" memory in the form of what the maker terms a Memory Dial, which guides you toward your destination, then automatically back to your campsite.

It is made of tough styrene plastic for rugged abuse, and is precision engineered with a jewel bearing for accuracy under all conditions. The compass measures only 1 3/4 inches in diameter and comes with a rawhide thong and instructions at \$2.98. You can order it from Tonka House, Dept. GW, 3430 Robinwood Terrace, Hopkins, Minnesota 55343.



1965 PEARSON CATALOG

Featuring a striking hunting scene painted by Tom Henton, the new 1965 catalog of Ben Pearson's archery equipment is now available.

The catalog contains twenty-eight pages of colorfully illustrated bows, accessories and leather goods. According to Walt Maupin, general sales manager, all you have to do to receive a free copy is to write to Ben Pearson, Incorporated, Dept. BA, Pine Bluff, Arkansas.



FOR BRUSH HUNTING

Here's some protection in that wet brush. It's a new parka-type coat of Reevair fabric that allows body vapor to escape, yet is waterproof.

The knee-length coat has an attached hood and raglan sleeves with elastic wrists. There also are pockets and a nylon zipper opening. It is light enough — twenty ounces — that it can be stored in the glove compartment of your car. Of nylon, it is strong and will not rot, crack or stick together.

It is available in blue, red, yellow or dead-grass green — whatever that is — and comes in a matching bag at \$27.50. It may be ordered from Charles Ulmer, Incorporated, Dept. GW, City Island, 64, New York.



COMPACT LIFESAVER

The Cutter Suction Snake Bite Kit features all the life-saving essentials for the emergency treatment of snake bite in the field.

The equipment is small enough to fit into the palm of the hand, since the kit measures just three inches and weighs only 1 1/4 ounces. It is available from Cutter Laboratories, Fourth and Parker Streets, Berkeley 10, California, for \$2.65.

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TECH TALK
(Continued from page 8)

produced superior results, the word would soon get around among better bowhunters and this style would command the bow market. Such is not the case.

("In purchasing a recurve, do not buy too short a bow, nor one with thin, flimsy recurves if you want dependable stability.")

GATES' GAME GETTER

I would appreciate any information regarding a story in BOW & ARROW'S Jan-Feb. '64 issue, Africa's Top Trophies With A Crossbow. I am keenly interested in the crossbow for hunting here in Canada, as we do not have any restrictions against crossbow hunting — yet. Does Gates manufacture crossbows for commercial use? Is there glass in this bow or is it metal? What poundage is the bow?

Byng Mayor,
Barrie, Ont., Canada

(Elgin Gates used one of the popular Powermaster crossbows, which sells for \$29.95 and has a pull of about eighty pounds. Or if you are looking for a custom bow, you might write to Dave Benedict, 20601 Covello Street, Canoga Park, California. He builds crossbows with draw weights ranging from 20 to 100 pounds and uses the latest recurve designs.)

BROAD QUESTION

I find that there are some rumors as to the width of a broadhead. As far as I can find out, the correct width is three-quarters of an inch across the blade. Can you shed any light on the subject for me as well as a host of others?

Larry E. Reed
Williamson, West Virginia

(You can obtain the correct regulations for broadhead width in your state by contacting the fish and game department in your state capitol.

(To check your own broadheads, cut a circle of the diameter prescribed by the state in a piece of stiff cardboard or sheet metal. If your broadhead will not pass through this circle, it is legal to use.)

COME NOW

I understand there is a repeating crossbow being made some place in California. I would appreciate information about where to get same.

Herbert Zuege,
Wisconsin Rapids, Wisconsin

(This sent everyone into the bar across the alley to discuss the possibility that someone was pulling our leg. But we still weren't certain that there really hadn't been a repeating crossbow. So we referred the letter to Doug Kittredge, who

knows about such things — or we thought he did.

(Back came his answer: "The repeating crossbow is not manufactured at the present time." Now we wonder if he's pulling our leg.)

BIG INJUN

I am interested in the way the Indians made their bows. I was wondering if you could help me. I am interested in the type of wood they used, or what would be best if used, the size and how they got the poundage. Also, how did they glue the wood and what was the size of their bows?

Steve Hanson,
Harlan, Iowa

(To start with, the composite bow was a stranger to the American Indian. He invariably started with a straight stave, going from there.

(The way of making bows as the Indians did it is a long story of considerable interest. We would suggest that you obtain a copy of the book, "Ishi, The Biography of the Last Wild Indian in North America," by Theodore Kroeber. This volume should be available through your local book shop. If not, you can order it by mail from: Kittredge Sporting Goods, P. O. Box 598, Mammoth Lakes, California. Price is \$1.95, plus eighteen cents postage.)

POPE & YOUNG SCORING

I have heard a good deal about the Pope & Young Club, but am confused as to their methods of scoring the racks of deer. I would appreciate it if you could explain this to me or direct me to a published source. I am not sure whether this is related, but I also have read articles in which the authors refer to a deer as having so many points, Western or Eastern count. Could you explain how the number of points on a deer is figured?

Richard W. Smith,
Long Island City, New York

(Pope & Young scoring is generally the same as the Boone & Crockett, the gun club. It involves a great number of factors, differing with different animals. In the case of deer, it is the number of points, length, width of spread, circumference of horn, etc., all added as points or subtracted if a detriment. There are persons appointed by the club as official scorers. A detail of methods used can be obtained from the NFAA Bowhunter's Manual, which is priced at \$2.

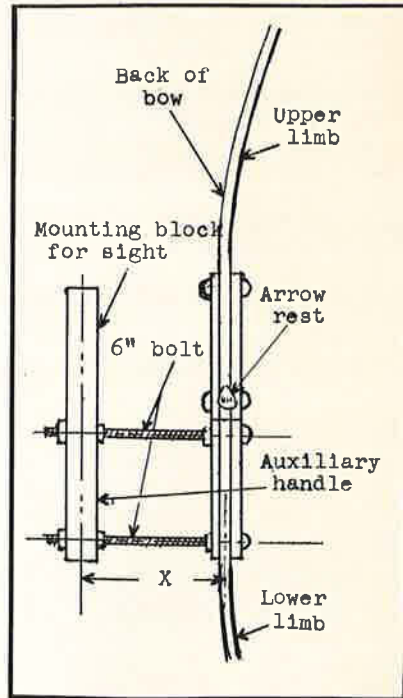
(Here in the West, we count the points on only one side of the deer's rack, but in the East, they count both sides. Thus, a four-point buck in the West could easily be an eight-point in the East.)

ALL PURPOSE BOW?

Some of your readers might be interested in an old modification of my bow that I recently made.

A number of years ago, I broke my left arm at the elbow. This has made it difficult for me to pull much more than 32 to 35 pounds at a twenty-eight-inch draw without tiring rapidly.

I have a forty-one-pound bow with aluminum alloy limbs, originally riveted together, two rivets in each limb. In place of the lower two rivets, I have substituted two one-quarter-inch bolts, each six inches long. I attached a movable handle that can be adjusted to a position up to 5½ inches in front of the back of the bow, thus allowing a full twenty-eight-inch draw with varying amounts of flexion of the limbs.



The accompanying table indicates selected draw weights for different positions of the handle. As the chart implies, quite a variety of people can use the bow. My wife, my children and I can all find an appropriate draw weight.

PULL WEIGHTS FOR DIFFERENT DRAW LENGTHS WITH VARYING DISTANCES OF AUXILIARY HANDLE:

Distance X (in inches)	Draw Lengths		
0	28"	26"	24"
1	41#	37#	32#
2	39	35	30
3	37	32	28
4	35	30	26
5	32	28	24
	30	26	22

Stephen R. Best,
University City, Missouri

FOR THE REAL THING

When I bought my bow, I did not know too much about the sport. My bow has been used constantly, and the imitation leather on the handle has come off and the section beneath was not lacquered. The bow is of laminated hickory. Would it be wise to sand this part and put on a clear coat of lacquer?

Chris A. Chord,
Baton Rouge, Louisiana

(You can go either to the local hobby store or your shoemaker and obtain a piece of leather from which to fashion into a hand grip, gluing it into place with Plio-Bond cement, or you can sand the bow handle and finish the wood with any lacquer obtainable at hobby or paint stores.)

HORSEBACK HUNTING

I am five feet, eight and weigh 150 pounds. This might give you some idea of my structure and help with the questions I ask.

If you were to purchase a bow and use it for ninety-five percent hunting and five percent for target shooting, what would be the ideal length for all-around sitting, standing and kneeling positions, also hunting on horseback in high brush country? What would be the best weight for this type of bow? I want to use it for hunting deer, elk and bear.

Pat Munyan,
Columbus, Ohio

(You mention horseback hunting in brush country. This indicates the need for a short bow. One to choose might be in 52-inch length. As for weight, you should choose no more than you can easily pull and handle. A weight of 50 pounds is ideal for any type of bowhunting. We don't recommend you drop below a bow with a 45-pound pull.)

OLD APPROACH

Last fall, I resumed the interest in archery I had as a youngster. Little did I realize the progress made in the sport. I credit most of my information to your magazine.

However, I have a problem. As a youngster, I developed a two-finger draw. I can't seem to change to the three-finger style. My percentage of hits seems to be adequate, but wonder if it would improve if I could change. I have never heard of or seen anyone else use this kind of draw.

Milton Keesler,
Utica, New York

(There are some archers who use a two-finger draw, feeling it gives them a smoother release. The major disadvantage is that it does not offer the same holding strength of three fingers. But as you seem to have no difficulty, why change?)

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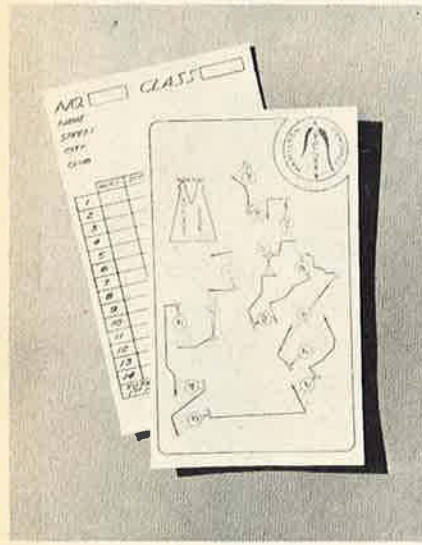
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CLUB CALL!



AID TO ARCHERS

RAYMOND M. ALBERTI of Granby, Connecticut, a member of the Hamilton Standard Field Archery Club in Windsor Locks, has sent along a score card which should prove of interest to other archery clubs.

On one side of this pocket-size card is the standard scoring arrangement with blocks for the archer's number and class, as well as his name, street and city, and finally, club affiliation. But on the other side of the card is the course layout — a virtual map — covering the entire fourteen targets. Such an aid as this can be of excellent help to visiting archers who may not be familiar with the terrain on which such a course is located.

LOOKING AHEAD

Ronald Polaske, publicity director for the Profile Bowmen of Strafford, New Hampshire, writes to report that his club sponsored a successful shoot back on October 4, and that a similar outing, drawing from other clubs for competitors, is planned for the coming spring.

"We have around thirty members

and are growing all the time," he reports. "Our aim is to promote archery in this area and we hope it is true and on target."

Such tournaments, preceded by proper newspaper publicity can do a great deal to draw those interested in archery to the tourney grounds as observers. From there, it is only a step to developing that interest into active participation.

CROSSBOW TOURNAMENT

G. R. Millard of Whitehall, Ohio, has been kind enough to send along the results of the 1964 American Crossbow Association's National Tournament held at Huntsville, Arkansas. The tournament was held atop Governor's Hill, and while a beautiful setting, the changing winds were strong and affected scores.

Placing first in the American Round was Bee Corbell of Odessa, Texas, with 634; Joe Linam of White City, Kansas, garnered second place with 595 and Arlis Coger of Huntsville, Arkansas was third with 472. The Ladies' Division was won by Corine Linam of White City, Kansas, with 296.

An outstanding event of the tour-

nament concerns the use of the rapid fire repeating crossbow. Five quarrels — or bolts — are loaded into the magazine, are fired, then the bow is reloaded with five more and these are shot. A total of ten shots must be launched in less than one minute.

Winner in the men's division of the Rapid Fire Repeater event was Joe Linam, while Corine Linam won the women's event. Mrs. Linam also won the Repeater Slow Fire category while Arlis Coger topped the male archers. In the Repeater, Novice Class, Gilford Millard of Whitehall, Ohio, was the winner.

FITA BOOSTERS

The Riis Park Archery Club will hold a shoot on their newly built indoor range at 6100 West Fullerton Avenue, Chicago, Illinois on February 6-7. Proceeds of this shoot will be donated to the FITA Fund to help send the U.S. archery team to Sweden this year. Pre-registration is mandatory and must be accomplished no later than January 25. Individual fee is \$1.50, while fee for a club team is \$2 additional.

CLUB RECORDS

We've mentioned this outfit before, but there's a special offer that certainly should prove interesting to club officials, since it is designed to help reduce their work loads.

Club Records Company is offering a free catalog of what they term "time-saving work saving Club Record Forms." The brochure illustrates forms for recording minutes, dues, membership, committees and financial reports. These forms are of the fill-in type and come in numerous types and styles.

To receive the catalog, write to Club Records Company, Dept BA, P.O. Box 93, College Park Station, Detroit 21, Michigan.

WORK OF ART

If you have ever ruined your eyesight by scanning some of the poorly mimeographed or otherwise repro-

duced results of tournaments, you are certain to join us in commending the Pennsylvania State Archery Association for their presentation of the results of the 1964 Annual Championship Tournaments in that state.



The scores and results are packaged in a neat printed binder that is excellent for permanent retention in the club's files. Although mimeographed, the work is neat and concise, and the results of the 19th Annual Field Championship tourney is on peach-colored stock. This section was arranged by the Defender Bowmen of Philadelphia and the Keystone Federation of Bowhunters after the shoot was completed at Fairmount Park in Philadelphia.

The section of this volume dealing with the 30th Annual Championship Tournament of the Pennsylvania State Archery Association is printed on grey stock, pleasing to the eye and easily readable. The statistics here were arranged by the Outdoor Sportsmen and the Conference Center, Pennsylvania State University.

And printed on the back of the folder are reminders of the dates and locations of the major tournaments to be held during 1965.

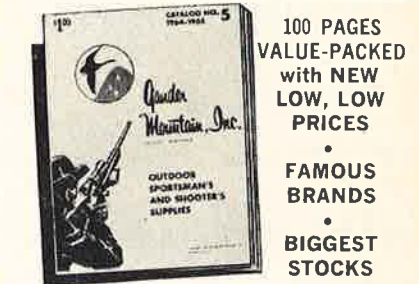
We'd say that even the national archery organization could take a lesson from this package and do something to make their results a little more readable and pleasing.

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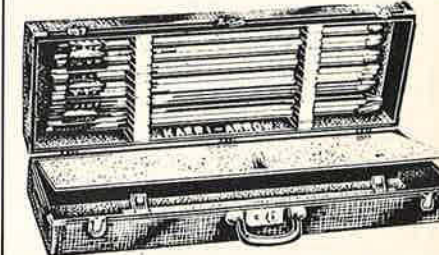
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COMPLETE FIELD GUIDE TO AMERICAN WILDLIFE by Henry Hill Collins, Jr., 683 pp., \$6.95. Published by Harper & Row. There is no doubt that this is a scholarly work and was meant to be just that. Generally speaking, it covers every species of bird, mammal, reptile and amphibian, food and game fish that occur regularly in the United States and Canada east of the Rocky Mountains and north of the Carolinas and Oklahoma — although not necessarily in that order.

Some idea of the degree of labor that went into its preparation is reflected, too, in the fact that there are more than 2000 illustrations and maps designed especially for this book. Some 700 species are pictured in full color.

THE COMPLETE BOOK OF ARCHERY by Robert Gannon: Coward-McCann, \$4.95, 256 pp.

In early chapters, as it should be, the author discusses the basic needs in the type of equipment needed by the beginner as well as that favored by the experienced archer. As the book progresses, the information becomes increasingly aimed toward the individual who is progressing in form, competence et al.

There are complete sections on field and target archery, tournaments, strings and stringing, and useful tips on how to avoid the more common shooting problems.

THE YOUNG SPORTSMAN'S GUIDE TO ARCHERY by G. Howard Gillelan. Thomas Nelson & Sons; \$2.50; 96 pp.

This thin volume is put together in eight easy-to-read chapters that will give the young or beginning archer full insight into the sporting aspects of the bow and arrow.

PROFESSIONAL AND AMATEUR ARCHERY TOURNAMENT AND HUNTING INSTRUCTIONS AND ENCYCLOPEDIA by George Leonard Herter and Russell Hofmeister; Herter's, Incorporated, Waseca, Minnesota; \$2.57; 288 pp., with 263 illustrations and photos.

THE BIG GAME ANIMALS OF NORTH AMERICA by Jack O'Conner. Published by Outdoor Life and E.P. Dutton & Company; \$10; 264 pages.

O'Conner discusses his hunting exploits with his usual relaxed style and good humor.

And nothing seems to have been left out; in these pages, the author takes us from the glaciers of the Yukon on a Dall sheep hunt to the jungles of Southern Mexico, where he hunted jaguar. In between, he discusses at length another twenty animals in the big game category and all of them native to this continent.

It's a top book, whether it's for your own hunting reference shelf or it's an educational project for the kids.

COLT'S BOW TEST

(Continued from page 27)

were reluctant to do much in the way of offering accommodating targets. Spooked by the breeze, they held too tight and what shots we were rewarded with were generally bouncing out behind them. One does not turn around fast while in the middle of a cactus patch more than once.

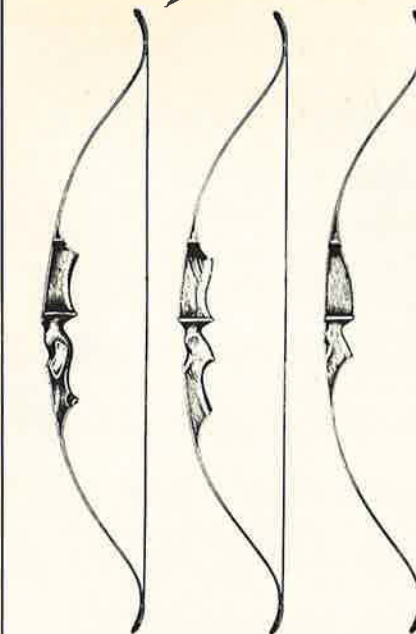
We did bust a couple and also worked over a covey of buzzing valley quail. The skimming top knotters were a real kick to fling away at with the flu-flus and once again the fast handling of the bows was apparent. On bigger game, our hits would have been assured, as many of them for a heart-stopping fraction looked like meat on the table. My *Plainsman* certainly got the shafts out to the mark in a hurry — not necessarily on the mark, but then you can't have everything. If I can come close, for me this is pretty good.

Although we did no long range shooting with either of the bows, there is no doubt that they will stay right with most hunters. Long shots are not really any criteria for a hunting bow anyhow. At fifty and sixty yards, instinctively pulling down on high balling bunnies and releasing laid the arrows right in there. Neither is a tournament bow and neither should not be expected to act like one. They are both compact bundles of energy designed for a purpose and I would say designed quite well. If I were to make any sort of choice, I would favor the *Plainsman*.

As I've said before, I do prefer a bit longer bow, and the sixty-inch is as short as I would care to shoot. For the reader considering a bow for the price, this is also a good reason for such a decision. The *Hi Power* is a bit more expensive at \$59.95, but the quality of the materials extra care and perhaps engineering all enter into these things. The *Hi Power* is designed with two tapered laminations in the limb and has a fast recovery. Ron found that the limbs are not tricky and have no tendency to twist. The *Plainsman* has one parallel and one tapered lamination, which should account for its slightly stiffer limb.

The Colt people have come a long way in their bow development in the past couple of years and these new bows, as well as the other in the line that includes all types and designs, indicate that they have given the subject much contemplative attention. An organization with their reputation is certainly not going to stand idle and attempt to attain prominence in a new field on past performance. The *Hi Power* and *Plainsman* are testimony to this point. ●

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NEW GUIDE TO BETTER ARCHERY, Second Edition, Revised and Enlarged by Thomas A. Forbes. This is an authoritative reference which deals with all phases of archery from how to select a bow to how to stage a tournament, including interesting chapters on bowhunting and woodcraft. Containing 343 pages, there are some 68 line illustrations by Ned Smith. A must for the serious archer. \$5.50.

MODERN BOWHUNTING by Hiram J. Grogan. Here is a book that is loaded with practical information; the kind you can use in the field. In the text, the author uses his own experiences to illustrate his various successes in hunting everything from crows to alligators, not to mention deer. Information on special equipment and advanced techniques for various game are spelled out. Contains 163 pages, center section of exciting hunting photos. \$4.75.

BUCKS AND BOWS by Walter Perry. The author is an ardent and successful deer hunter as well as an enthusiastic target archer. As suggested by the title, this book is devoted exclusively to hunting of deer with bow and arrow, and it includes full information on types of tackle, as well as best ways and means of downing your buck. Has 223 pages, 72 illustrations by author and Edward B. Hagey Jr. \$4.95.

LIVING OFF THE COUNTRY by Bradford Angier. This book has all of the information needed for staying alive in the woods, whether you be survival buff or simply the hunter who wants to be prepared against the possibility of being lost or running out of food. The information is practical and tried by the author and others. Contains 241 pages with humorous practical illustrations. \$5.00.

ALL ABOUT CAMPING by W. K. Merrill, U.S. Park Ranger. This book covers the field with facts and sage advice on every possibility from trailer camping through survival, touching on safety and first aid. It is certain to make your trip happier, safer, and more interesting. Has 262 pages, over 100 illustrations. \$3.95.

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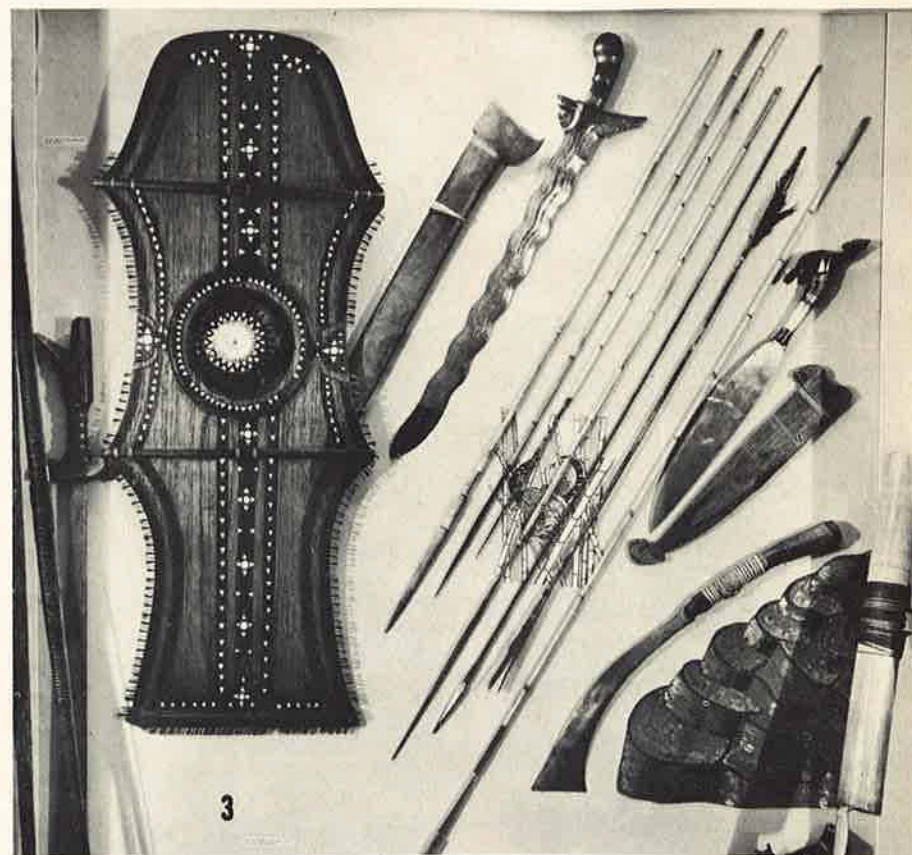


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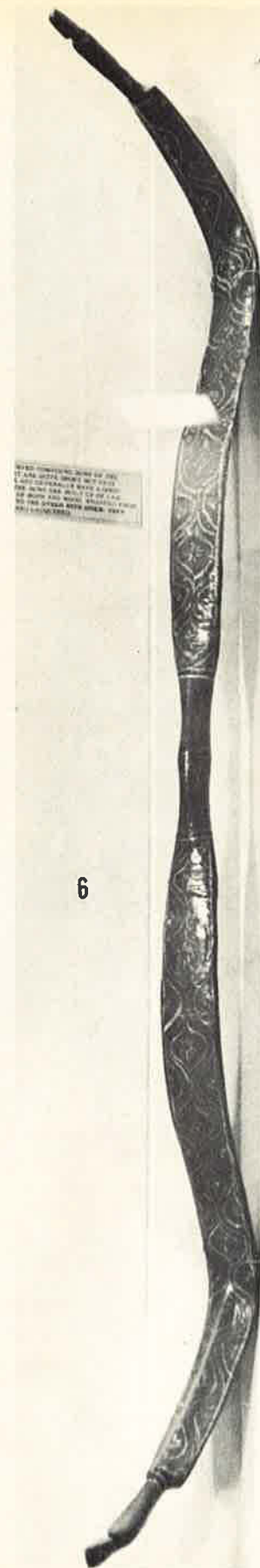
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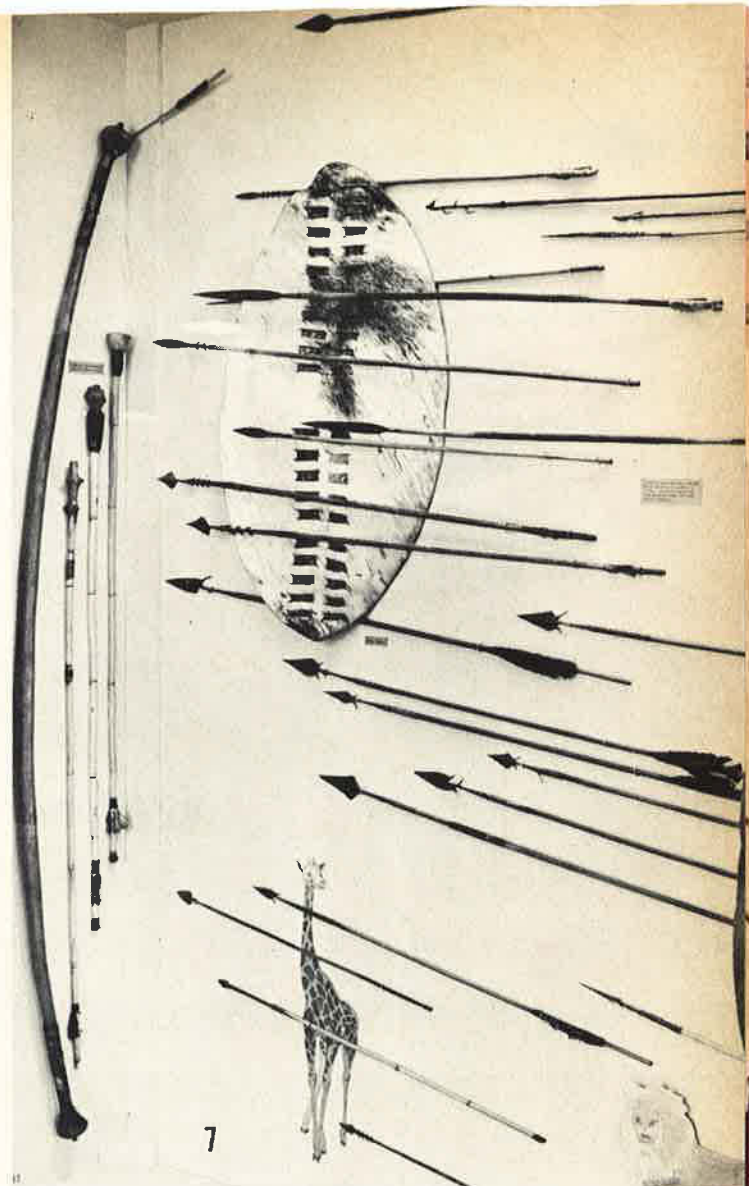
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archery around the world

By Steven Barde

A desire to see the American West, combined with failing health, brought English jeweler Joseph E. Jessop to San Diego, California in 1889. He had read of the American Indian and became very fond of the Indians in the Southern California area, as well as throughout the Southwest. When he first arrived in California, he bought a ranch northeast of San Diego, but soon moved to town and re-established his jewelry business.

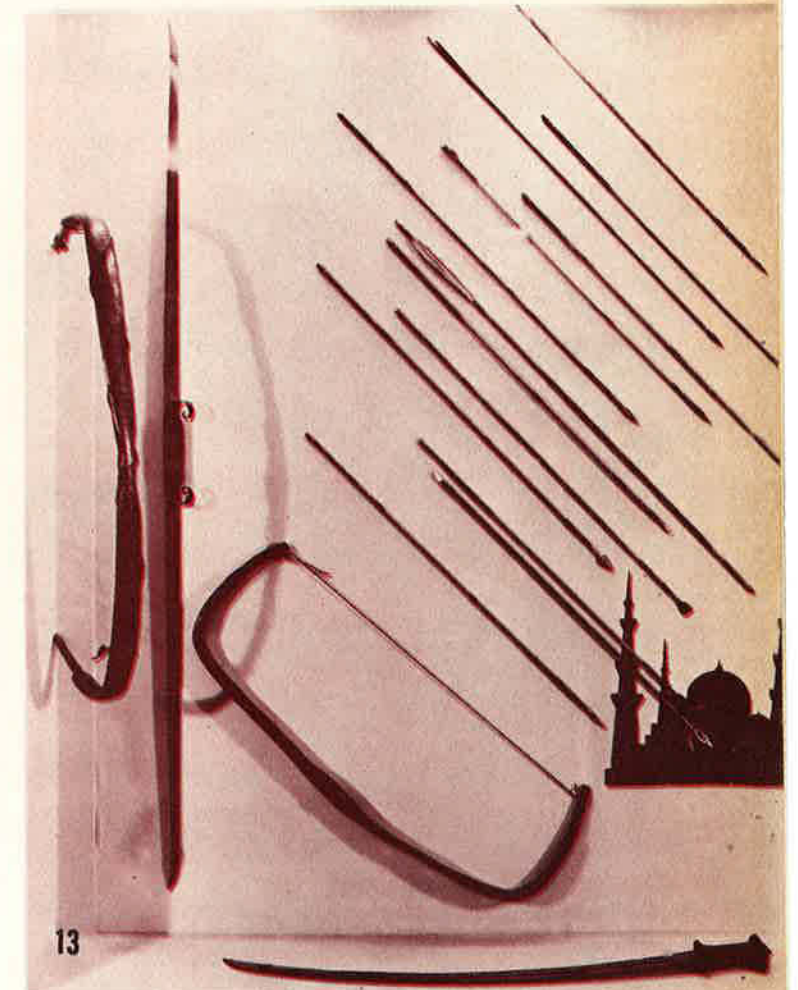
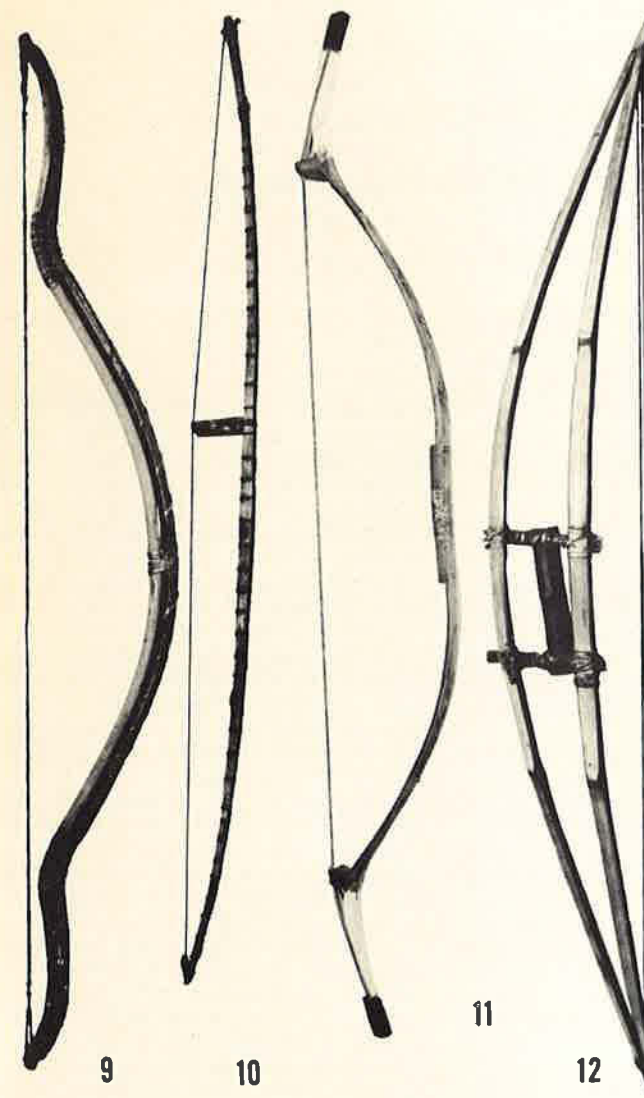
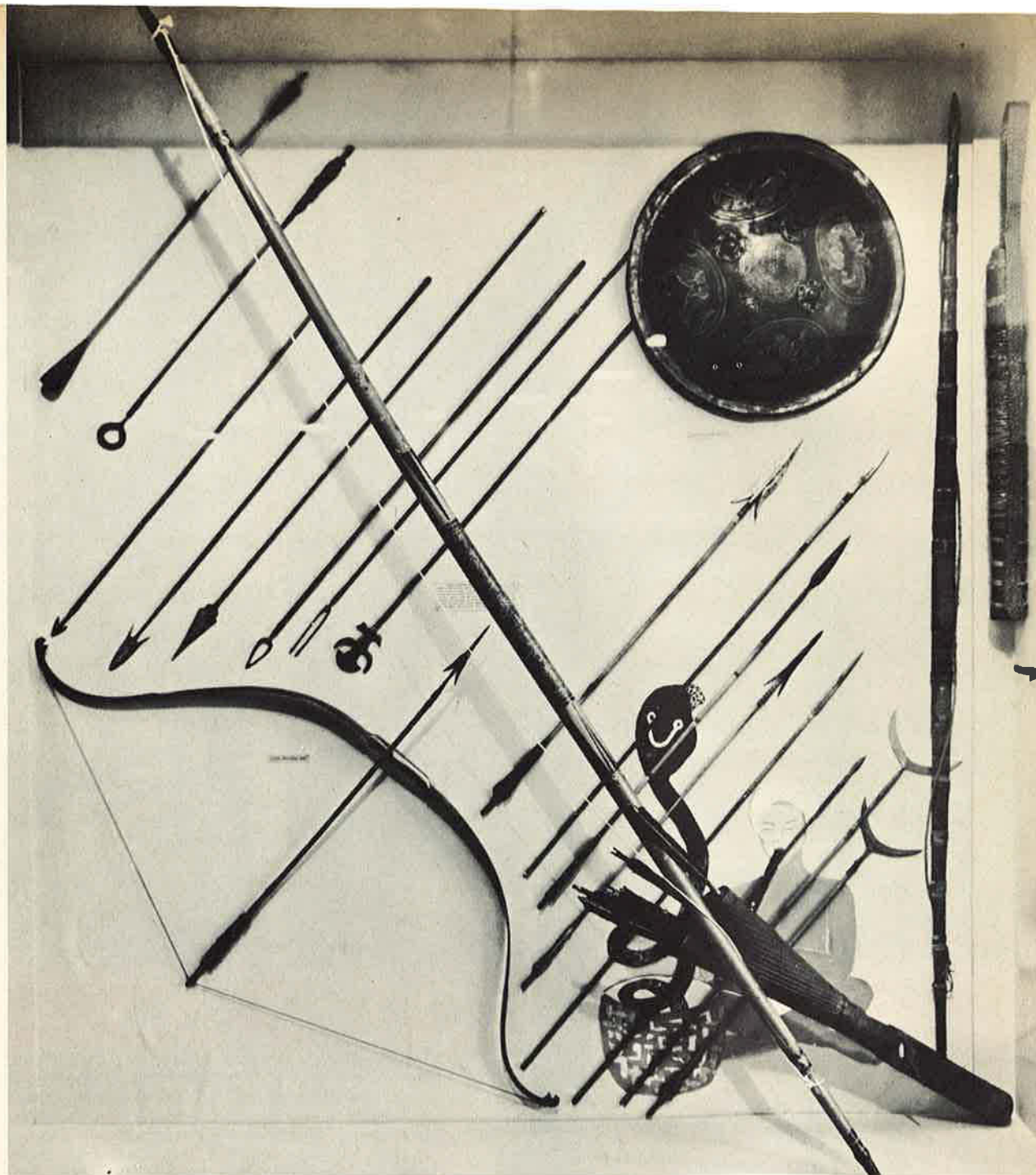
While traveling the Southwest, Jessop started collecting bows and arrows of the different Indian tribes. As he became older and his sons took over the jewelry business, he became semi-retired and moved to the island of Coronado in San Diego harbor, where he built a ten-room home. In 1910, he took up the sport of archery, which he continued to enjoy until he was eighty-five years old, and became the first man in the San Diego area to start in target archery. The public, driving by, would stop and watch Jessop during his practice sessions. Over the years and through a natural ability, Jessop became an excellent archer.

As the sons grew up and moved from the big house in Coronado, the ten rooms became filled with archery tackle that he had collected and some that he had purchased. Jessop paid a fellow jeweler in England \$2000 for a collection of African archery tackle. Between Jessop's travels and his purchases, the rooms



5

1. San Diego's Museum of Man has an endless flow of visitors, many of whom are interested in seeing the extensive collection of weapons. 2. Clark Brott, curator of the North American collections, examines a new acquisition. The bow is of willow with a sinew string and was used by the Kaliwa Indians in Santa Catarina, Baja California. 3. The Philippine Islanders used the bows on the left. Arrows are of bamboo, some fletched, some not. The shield is beautifully inlaid. 4. Indians of the Northwest made this bow from cedar and yew. These bows sometimes have a slight recurve. Arrows are fletched with arrowheads of steel or iron. 5. The intricate carving on these arrowheads of hardwood is evidence of their South Pacific origin. 6. Close-up of this Persian bow shows the intricate decoration and the width of the limbs. 7. This display of African weapons shows the iron-tipped arrows used for hunting and warfare as well as blunt-tipped shafts used for downing small game.



eventually became stacked with archery equipment. The boys would help him tie the iron tips to the shafts, polish the bows and other primitive weapons their father had collected.

When the collection became too large, Jessop hired people to tabulate and file the collection which he loaned to the Museum of Man in San Diego.

Jessop didn't hunt with the bow but he did take some of the collected bows and test them for shooting distance and draw weight. Some bows were too old to string but those that he thought strong enough to shoot, he tried.

Jessop helped his sons make spending money with his archery hobby. The island that became Coronado was formed from the silt of the San Diego River. The soft, loam soil was ideal for the gopher and they made it their happy home, much to the chagrin of the towns-

people. The city paid five cents for each gopher delivered to the city hall. The Jessop boys would make some of their spending money catching gophers. Their father would stand in the yard and wait for a gopher to stick his head out of the hole he was making, then would shoot him with an arrow. The boys would collect the gophers and take the day's shooting to the city hall to collect their bounty.

At present, there are twenty-one cases of archery tackle from around the world in the Jessop Weapon Collection in the Museum of Man, located in Balboa Park in San Diego. One Alaskan Eskimo bow is about 140 years old. The collection came from Japan, China, Persia, India, Ceylon, the Philippines, South America, the far north land of the Eskimo, the warm climates of the South Pacific, and many from the American Indian tribes. Joseph E. Jessop even collected the

boomerangs of Australia, the one continent that had no archers.

In addition to the tackle that is displayed, there is an overflow in the museum storeroom. New cases and more displays are planned to enlarge the collection to show more weapons and weapons of different types. Since the Jessop collection was loaned to the museum, there have been other bows and arrows donated by other people and many that have been picked up by anthropologists while studying the people of the different continents. These will be added to the collection in the future.

The next time you come to San Diego to compete on the field or target range, allow a little time to stop in the Museum of Man to look at this interesting collection. ●

8. India fostered these bows and unique arrows. The bow at lower left is a full recurve made of steel. Arrows are fletched with as many as ten feathers. 9. This Eskimo bow is probably made from driftwood, hardly the most suitable material. 10. Another Eskimo bow has a wooden stop to prevent the string from hitting the archer's arm. These bows are backed with twisted or braided sinew, the sinew, in turn, tied to the bow with wrappings of the same material. 11. This is a laminated bamboo bow of Chinese origin. Note the string stops at upper and lower ends of the limbs and the built-up handle riser section. 12. This is a pebble-throwing bow from Southeast Asia. It has a double string and double limbs, with the handle in the center. 13. These bows, of Persian design, are laminated and covered with designs. Bow in lower left center is strung incorrectly. As a recurve, the string should go around the outside of the curve. Arrows are steel-tipped. 14. Other arrowheads of the South Pacific tribes are not as viciously barbed and are highly decorated.

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books for bowmen



WILDERNESS COOKERY by Bradford Angier. The Stackpole Company; \$3.95; 256 pp. When one considers such a book as this, one first wonders just how is the author qualified to write on such a subject.

Brad Angier, is a former Boston newspaper reporter and magazine editor, but he resigned to devote full time to outdoor living and writing. He now lives near Hudson Hope in British Columbia on the remote headwaters of the Peace River. An earlier book, **How To Go Live In The Woods On \$10 A Week**, turned out to be a minor best-seller. It stands to reason that a man who can do that successfully has to know something about cooking game he may shoot or taking advantage of nature to keep his weight up.

But while this contains cooking directions rather than out-and-out cut and dry recipes, this can hardly be considered a cookbook *per se*. After all, it's doubtful that there is a cookbook anywhere that contains humor and anecdotes.

In an introductory chapter, Angier tells one exactly what he can expect in living in the wilderness or "silent spaces," as he chooses to term them. He describes the type of equipment one will need for cooking and eating, then launches into a series of chapters dealing with preparation and storing of various types of game. There's even a section on how to cook moose muzzles . . . even how to prepare jellied moose muzzles.

That may not be a recipe you'll use every day, of course, but it's not one you'll be likely to learn every day either. And it's included here.—MH.

PHEASANTS IN NORTH AMERICA by Durward L. Allen; The Stackpole Company; \$7.50; 490 pp. The average pheasant hunter who treks into the nearest cornfield to get his limit of these colorful cocks is going to be dubious as to whether any man can fill an entire volume on this bird. Or he is going to ask why.

However, this is another in the publisher's series of books produced in conjunction with the Wildlife Management Institute of Washington, D.C. In this age when preserve shooting is becoming more popular and certainly more necessary due to rural lands being gobbled up wholesale by housing developments, the potential preserve operator must become an expert in many fields. One of these facets, naturally, deals with knowing pheasants from birth to shoot.

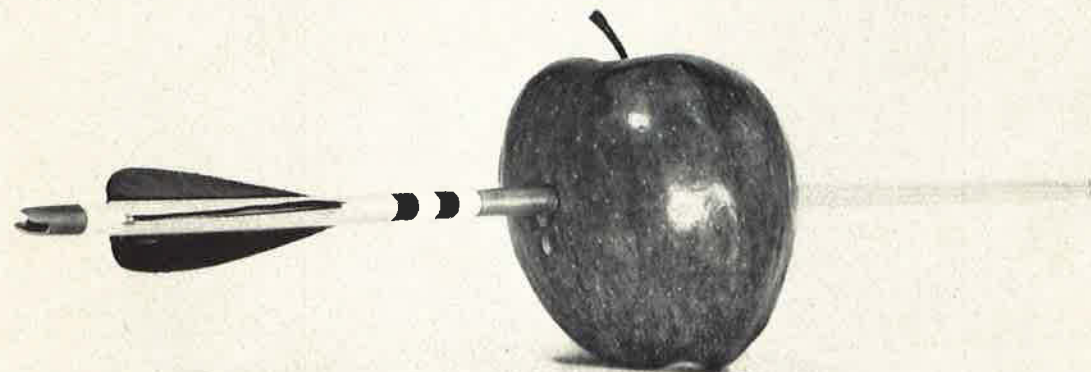
This volume actually was edited by Allen, who is associate professor of wildlife management at Purdue University and the former chief of the branch of wildlife research for the U.S. Fish and Wildlife Service. The individual chapters, broken down to cover species and specific regions where the birds are most plentiful, have been written by other experts in the field of game management. However, Allen has reserved the final chapter for himself. The chapter is titled **The Management Outlook** and brings to light many interesting facts that have been gleaned over his years in this field. For example, he points out that "you can take those regions that support pheasants and set up a fertility scale of farming areas, from the poorest to the best — and you also will have a scale of pheasant numbers from lowest to highest populations."

The requirements in the type of soil, the effects of weather and the problem of predators all are covered in this volume. If you have trouble finding pheasants, you'll know why after finishing this volume.—MH.

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