BOW & ARROW

50 CENTS

SEPT.-OCT. 1963

THE NEW MAGAZINE FOR THE ARCHERY ENTHUSIAST

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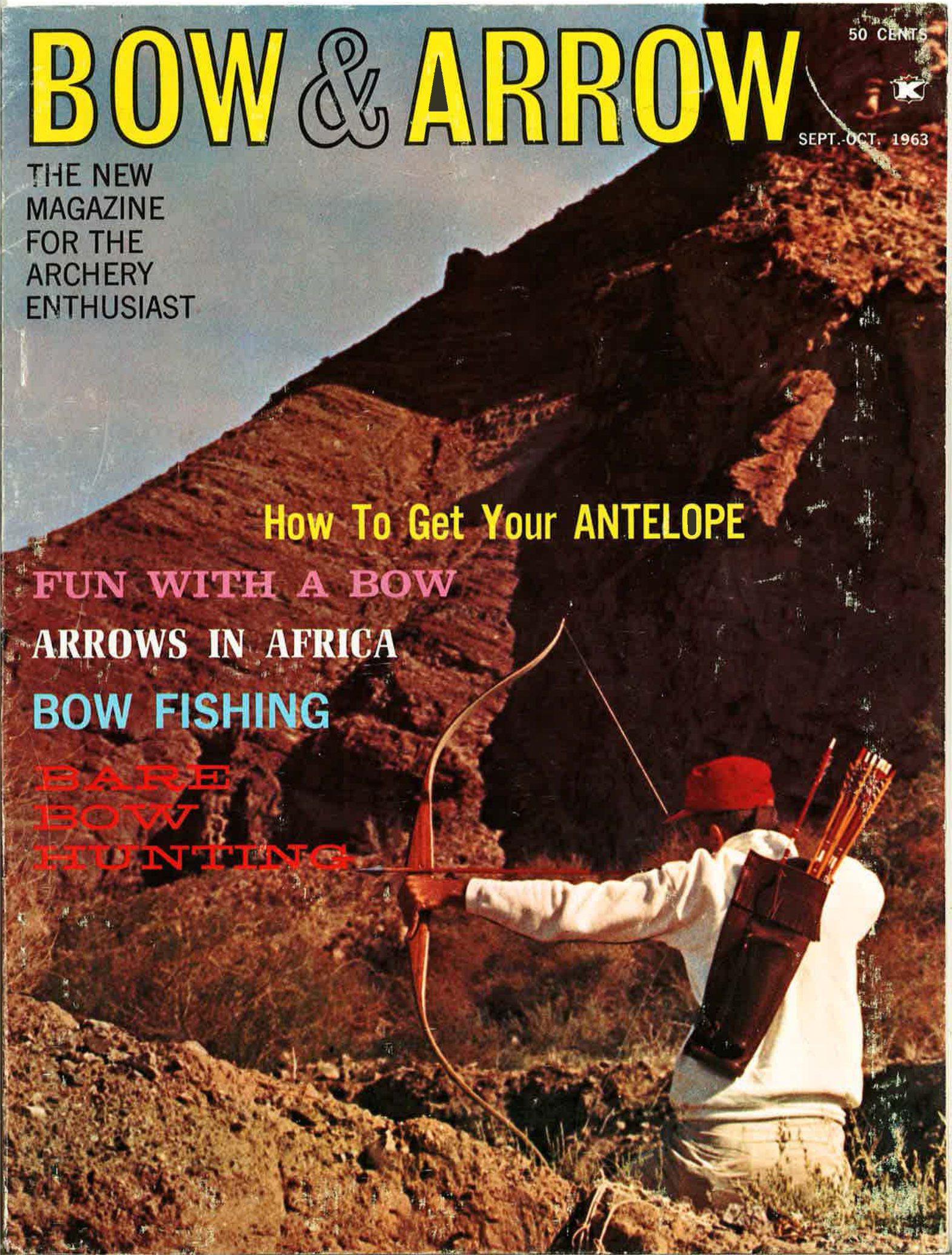
FUN WITH A BOW

ARROWS IN AFRICA

BOW FISHING

BARE BOW HUNTING



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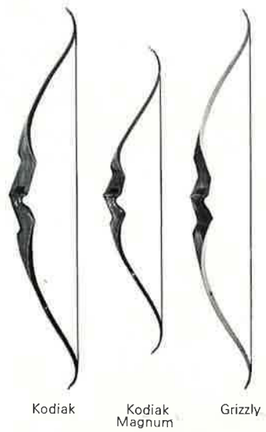

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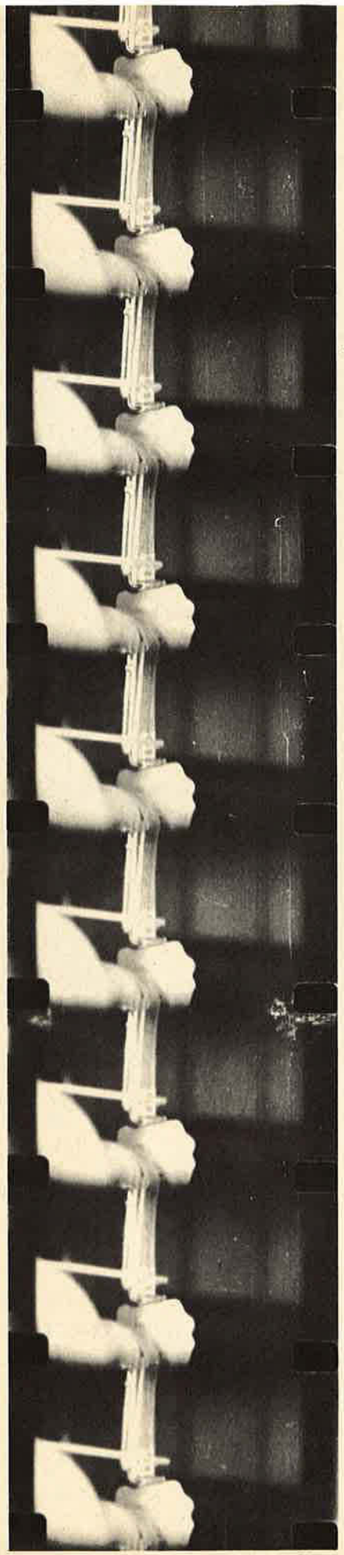

BOW & ARROW

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VOL. 1, NO. 3 SEPT-OCT, 1963

ON THE COVER: Harold Ferguson draws a Colt arrow in a Colt bow during a hunting trip in the New Mexico badlands. Quiver is by Ben Pearson. Cover Photo by Ray Rich.

BOW & ARROW is published bi-monthly by Gallant Publishing Company, 550-A S. Citrus Ave., Covina, Calif. Business and editorial offices: 550-A S. Citrus Ave., Covina, Calif. Single copy price: 50 cents; subscription rate: $3 per year. Application to mail at second class postage rates is pending at Covina, Calif., with additional entry at Rockville, Md.

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Mail Pouch

OLD COLLEGE TRY

I am a student at Everett Junior College. Today, I bought your first edition of BOW & ARROW and read the whole book before I laid it down. I sure found it interesting and full of useful information.

I especially liked the *Tackle Tips* by Corky Johnson on canting the bow. I cant my bow and I shoot instinctively. I have a woman archery teacher at college and she is trying to get me to hold my bow straight up and down, and I can't shoot this way. Yet, she still wants me to hold the bow straight, so I am going to take your magazine to my next class and show her the tips by Corky.

I enjoy archery very much and have been shooting for quite a few years. In fact, it's the only thing I've gotten an 'A' in in college. Another article I liked was on the *Bow Birds*. The shark shooting also was very good.

Congratulations on a fine magazine; you've made me a steady customer already, and I'm going to tell my archery class about your book. I'll be waiting for the next edition.

Dennis Kjolso,
Everett, Washington

(Well, looks like we've gained a class — and lost a teacher.)

FROM ALASKA WAY

This is the first time I have ever written to a magazine, but I am so pleased with B&A that I have decided to drop a line commending you on your efforts. I think that by far, it is the finest for the average archer and that it will remain so.

Of the few names I recognize in archery, Doug Kittredge, Corky Johnson and John Duncan stand out right away. I expect to learn much, especially from *Hunting Hints*.

Of my own interest, I hope to see varmint bow hunting, making a bow, tests of equipment, big game hunting and cedar and glass shafts among the articles in the coming issues.

Laurence Meyers,
Clear, Alaska

(Most of Mr. Meyers' suggestions for articles have been covered in our initial two issues, but there'll be more in this and future numbers.)

AND FROM CANADA

Hooray from London, Canada!

I must say that both my wife and I found the first issues of B&A something that long has been needed (in Canada by all means). The story on the Japanese archers certainly warrants a pat on the back to Colonel Rankin.

Hoping to see more of this caliber of article.

Herb Ewart, President,
Ca-Nu-Pa Archery Club,
London, Canada

(You'll be seeing more of Colonel Robert Rankin's writing in forthcoming issues.)

I've been an avid archer for many years and I've read ALL the archery magazines, both Canadian and American.

They all have something missing, making each one incomplete in itself. You have the answer to the versatile archer's need: Information on all phases of archery.

Len Gensens, BSc.,
Don Mills, Ont., Canada

TECHNICAL VIEWPOINT

The authors of *Operation Experiment* (B&A, June-July 63 issue) are to be complimented for their informative and stimulating article.

Several discrepancies and apparent inconsistencies attracted my attention and resulted in the following analysis.

It should be understood that the bow is a non-linear spring system and behaves in a predictable manner. A plot of velocity versus arrowweight is a smooth curve with no discontinuity.

The published results do not form a smooth curve. The most apparent deviation is the 1916 aluminum arrow (355 grains) and the 2114 (352 grains). These arrows are almost the same weight, yet their velocities are markedly different, 181 ft./sec. and 193 ft./sec. respectively. A fairly good speed is about 180 ft./sec. and a fast arrow has a velocity in the area of 190 ft./sec. If the velocity of the 1916 arrow is correct, that of the 2114 should be about 182 ft./sec. (From a velocity-weight plot of author's results.)

The reported 181 ft./sec. and 163 ft./sec. for the 1916 arrow, using feather and plastic fletch respectively are unreasonable when considering the equal weight of the arrows. Regardless of the fletching, there is no significant difference in velocity close to the bow.

Error has been introduced into the experiment. A look at the method of breaking the circuit shows that:

(1) The arrow must pierce the first grid — energy is lost here. The amount will depend on the resistance of the material, tension and size of the tear.

(2) Tension in the grid and size of tear will yield random values for the same arrow.

(3) In the case of the feather and plastic results, the tear will be the indeterminate variable. Feather, being much less stiff, bends through the hole, while the plastic fletch must force its way through, causing more energy loss and resulting in lower velocity.

This article is a noble achievement. More articles of this nature should be published to clear out some of the misconceptions some archers have been entertaining.

Lawrence Luterman,
Westinghouse Electric Corp.,
L/T Engineering Mechanical Division,
Lester, Pennsylvania

(We had already come to realize some of the variable about which Mr. Luterman writes; but we wish we could afford this man on our staff. He, too, is noble in the manner in which he tells us of our errors!)

PRESIDENT SPEAKS!

I really appreciated your first issue and after reading your statement of editorial policy, I think I am going to like it even better. There is too much editorial policy now and not enough real effort to promote all archery instead of each special group. Give us just the facts, plus those interesting articles and your publication will do all right.

Ned Rudd, President
Kentucky Archers Assn.,
Ashland, Kentucky

A FRIEND INDEED!

I was impressed when I walked into my favorite book store and ran into your BOW & ARROW magazine. I bought one and took it over to Great Falls Sports Goods, who sell a lot in the line of archery equipment and showed your magazine to the management.

They were happy to see it, and the next day I noticed they had a large supply of BOW & ARROW on their book shelf.

I think your magazine will become very popular and helpful to us archers.

Al W. Rossmiller,
Great Falls, Montana

(With this letter, we know we have a champion in Great Falls!)

ACCIDENTAL APPROACH

I recently became acquainted with your magazine by having it loaned to me by a friend. I don't have to tell you how long we, the archery-minded public, have been waiting for a magazine such as yours to reach the market. Needless to say, it meets all the standards we expected of such a publication.

Getting back to the copy of BOW & ARROW which was loaned to me — hold your hats — my son spilled something all over it and effectively cemented the first ten pages together. My friend has

(Continued on page 55)

HUNTING WITH Dovg Kittredge

Who's the greatest bowhunter you know of? Is he also the most accurate shooting archer you can think of? Do you know of any archer-hunter who is a better basic hunter, or knows more about wildlife in general?

I think you'll find in answering these questions that the best bowhunter is not necessarily the best archer, but probably is the man who excels in hunting technique. The crafty old Indian hunted with the most primitive of equipment almost impossible to shoot with any degree of accuracy, yet he filled his game bag regularly through his highly developed ability to get in close to wild game. Accurate shooting ability is a big advantage to the bowhunter, but skillful hunting technique is a must!

With archery deer hunting season opening up all around us, let's take a gander at a few of the ways the successful bowhunter goes about filling his tag.

To know where the deer are is knowledge many archers leave to luck. It's surprising, but at least half of the less experienced bowhunters hunt areas where there are no deer. They choose their hunting area because it appeals to them, rather than because it appeals to deer. Naturally, the more deer that inhabit the area you hunt, the better are the chances for success.

The knowing bowhunter keeps his ears open whenever he happens upon a conversation about good deer hunting. He is not afraid to ask "where," anytime a speaker mentions quantities of deer, especially big bucks, or particularly easy hunting. Whenever a speaker seems cooperative, follow through and find out exactly "where" he is talking about. Ask if he would pin-point the area on a map and carry an assortment of maps in your car so you can take advantage of such willingness to help. Be sure to get detailed information as to the best way to get there, where to camp, and what specific little canyons, etc., seem to be the best to hunt.

Keep a file of all such hunting area information you obtain. Date when the informant was there last and show the date you obtained the information. Hunting areas have a habit of changing year by year and you will want to be sure to check out any old information before planning a definite trip.

Gun hunters are one of the best sources of hunting area information for the archer. Normally hunting during a different season, the knowing gun hunter often will pass on good hunting spots to an archer, where he wouldn't breathe a word of them to his fellow gun hunters. Areas that are good during the gun season, can prove to be truly a hunter's paradise during the archery season when the deer are not yet alarmed and the bowhunter may find other archers don't yet know of the spot.

Take time before the hunting season to scout the potential areas you consider hunting. Do this reasonably close to the season; some deer herds move into, or out of, an area during the early fall and you will want to see the area as it will be during the actual hunt. If you plan to hunt with a buddy or two, each person can take a different area over a weekend and then, by comparing notes, decide just where to go during the hunting season.

A rifleman's spotting scope of twenty-power or so will be worth its weight in footsteps during a scouting trip. It enables you to scan vast areas of hillside and valleys without walking through them. Look over the hunting country during the early morning and late evening hours when the deer normally move about, feeding. Pay particular attention to feeding areas, brushy hillside slopes, oak and aspen patches and the edges of meadows. Try to get an idea of the overall concentration of deer and how they are working in that area.

Take a walk into the hunting area looking for deer trails and other sign. Fresh tracks on well worn trails are a good guide to deer hunting area. Where trails are little used and you see but few deer during the feeding hours, the hunting will be sparse. A few such scouting trips made before the season will insure you of a choice of areas with the odds strongly in your favor for success.

Arrange to get into hunting camp a few days before the season opens. This gives time to set up camp, to become acclimated to a change in altitude, and most important, gives time to scout the hunting area in detail. Time spent before the opening is worth more than the hunting season itself. It is better to sacrifice a few days of hunting to be in the "right" place on opening day.

Beware of making too much noise around camp. In some manner, deer apparently can transmit a feeling of fear and unrest for the entire herd, making all of the animals in the area jumpy. In hunting areas where vast numbers of hunters congregate, just the preliminary driving on local roads, voices, and noise of establishing camps can alarm the local deer to the point where they are difficult to approach, even on opening morning. It is best to try to pick hunting areas where there will be few other hunters.

There are three major methods of deer hunting with bow and arrow: Stalking on foot, hunting from a blind or stand, and organized drives.

By far, the most popular is stalking. The ability to pussy-foot up on a wary wild animal without his being aware of your presence is a woodsman feat to be proud of! This is the hunting style of most beginning bowhunters, and ironically, it is the most difficult to master. To have repeated success, the stalker must have a thorough knowledge of deer, their habits, and how they can be expected to react under various situations. The stalker must know where the deer are to be found; he must be skilled in moving slowly and quietly at the right time, with a knowledge of wind, and a trained ability to see game in the field.

The Indian said — "Move a little, see a lot," and this is stalking in a nut shell. The key is to stalk in an area where you know there are deer. During a morning or evening hunt you are not going to cover a great deal of ground when you move as slow as you should. Your previous scouting the area will pay off real dividends when stalking.

The best time to sneak up on deer is the time of day when they normally are moving about. After they have bedded down, all of their senses are tuned to hear, see, or smell an intruder. With such hunting, the archer sees only the north end of deer going south . . . affording running shots of the worst possible type. With deer moving about feeding or to and from bedding grounds, chances are good that an animal will move towards the hunter. Small noises and slight movement is not as alarming, as it is expected during the hours game moves. Once the woods are quiet, and movement stops, the hunter is at a definite disadvantage with every movement he makes.

Game usually moves early morning and late evening. The first three or four hours of morning and last hour or two before pitch dark are the best times to find game afoot. The stalker should be into the hunting area just as the sky begins to grey during the morning hunt. This often can

(Continued on page 60)

TACKLE TIPS

Corky JOHNSON

Just how big a part does luck play in bowhunting? After analyzing my own kills and talking to other successful bowhunters, I would have to place the luck element at about fifty percent.

Some of the bowhunters that I asked this question of, put the luck element at from seventy-five to ninety percent. There will be some eyebrows raised at these figures, especially by some of the more ardent bowhunters, but when you break bowhunting down into parts, you get a much clearer picture of the luck element and just how actual skill does pay off.

Let's take the moving aspect of bowhunting: Most of the bowhunters that I talked to put one hundred percent luck in this category, while others put it at ninety percent. When you think of the things that have to be right to hit a moving animal, it is a wonder that any are hit at all; yet almost twenty-five percent of my big game kills have been while the animal was on the move.

It would be easy for me to stick my head in the air and proclaim myself quite a bowhunter, but I am not that naive, and I know that I may not hit another moving animal for years to come. The lead has to be perfect, and just how do you figure the lead on a deer bounding along at about fifty yards, with a few trees or bushes thrown in to complicate matters? I do not even try to figure this lead, but merely judge the distance real fast, then swing ahead and let fly. In the case of one of my running shots, the deer was heading for an opening in the bushes and I held on the opening until the angle looked right, then I released my arrow. Fortunately everything was in my favor and the broadhead hit the deer in the hams and sliced through the femoral artery and the deer bled-out within one hundred yards.

Luck? I would say so, even though I meant to do just what I did. My other three moving kills ranged from thirty-five to eighty yards and I would have put the luck tag on all of these moving kills.

Again, there may be a question raised that to make one such moving shot could be luck, but to make several then it may border on the skill aspect. Again, I will stick to the luck theory; an archer could practice all year on moving targets, but when he finally got that running shot, it would in all probability differ in every way from his practice.

But the archer that did make use of this type of practice would have a much better chance of connecting than one who shot at only still targets all year.

How about the shot that is made while the game animal is standing still, and as the arrow is released, the animal moves right into the path of the arrow? It would have been a clean miss except for this movement and this kind of hit is not too rare according to some bowhunters who have witnessed it. This is a case of just plain luck and no other tag can be put on it.

Now where does the skill element enter into bowhunting? This starts by knowing your games' habitats; their feeding, drinking and bedding areas — the importance of knowing from what direction the wind will blow in early morning and late evening. It deals with the ability of the archer to make a stand and hold it until the game has quit moving. The art of using camouflaging and constructing or making use of natural blinds must be known.

To have the ability and practice to pick a spot on your game and to shoot at this spot instead of just at the animal in general, this one point probably causes more misses at game than any other single item. I know of one archer who shoots in the champ class on the field range and has at least thirty deer to his credit, yet has admitted to missing a big buck at right around eight yards. When I questioned him, his answer was that he had literally thrown an arrow at the buck instead of picking a spot at which to shoot.

The buck still was standing and he had plenty of time, but he felt that it was a cinch shot and paid for his mistake in not hitting the deer at all. I have noticed, while roving with archers who cannot come within one hundred points of myself on the field range, that they make as many good shots at small game as I do and even outshoot me at times in the field.

I lay this to the fact that, when shooting at a small object, one's concentration point is much finer. Where these archers run into trouble on a large object is that they fail to pick a concentration point and so fail miserably in their consistent hitting. I have put some archers to the test, who did not go along with this theory, and have received many apologies when the final analysis was reached.

Here are the basic steps we used to come to these conclusions. Step off about fifty yards and put up a small object at which to shoot. Then have each archer shoot five or six arrows so as to have some kind of arrow pattern from which to work. After marking each archer's hits, put up a large target and let them reshoot their arrows. You will find that the arrow patterns on the smaller target will be much closer to the center than on the larger target.

I shot with one archer in an Animal Target Shoot not too long ago and he was having a miserable time of it. He was shooting two and three arrows to almost every target. I finally asked him what was bothering him, but he could not come up with an answer even though he tried to dope it out mentally. He was on the verge of actually quitting — he was that disturbed. So I suggested that he pick a spot on the next target and shoot at the one spot, forgetting about the rest of the target.

He tried this and got a one-arrow hit in the animal, and from there on out he would pick a spot and shoot at it. He did not come from behind and win or set any records, but he did improve considerably and his outlook was much brighter than before. It takes practice and lots of it to make yourself pick a spot at which to shoot; especially if you have been generalizing on your targets or game; but if you discipline yourself rigidly it can be accomplished in a short time. Picking a spot on moving game is real difficult, but it does enhance your chances for a hit.

As a parting thought for this month make doubly sure that your broadheads are as sharp as you possibly can get them. The edges will vary in sharpness from the honed edge to the serrated edge. Each will do a great job in its own right, if properly placed.

There is much controversy concerning the various edges, but I have had good results from all of the different kinds. I have used the single-blade broadhead with serrated edges and have had excellent results. I have used the three-bladed head with and without the razor blades attached and had equally good results. The main thing is to have them sharp and get in close to your game, so that you can place them in a kill area. One oldtime archer hit the nail on the head when he said, "Hit them anywhere with a broadhead, but make darn sure that the head is sharp. Luck or skill, the meat on the table tastes the same." ●

THE WORLD'S
LEADING
BIG GAME
HUNTER WRITES
OF THE
FUN AND
FRUSTRATION OF

HUNTING IN AFRICA!

BY ELGIN GATES

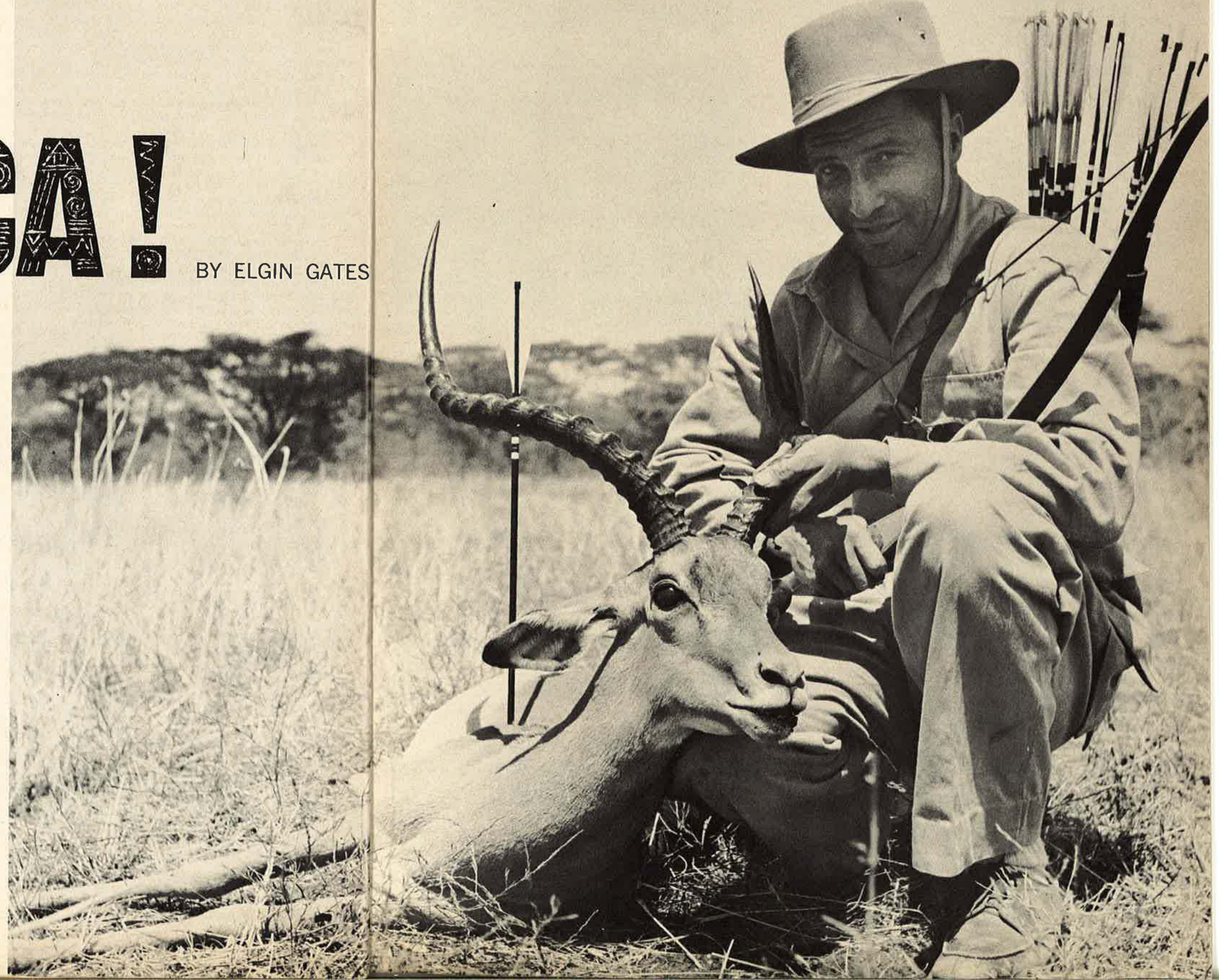
AFRICAN SAFARI! These words spell magic. They suggest stalking wild game in unfamiliar surroundings, waiting for just the right moment to release a feathered broadhead and bring down a magnificent trophy — the dream of all bow hunters.

The dream began long ago and began to materialize when I planned a safari to Africa to collect elephant, rhino and buffalo. For this game I took a heavy rifle since I had neither the equipment or the intentions of shooting these animals with a bow and arrow. It was my intention however to use the bow on any of the smaller game animals that chance allowed.

The fun began soon after I landed in Nairobi, the capital city of Kenya, in East Africa. Going through customs at the airport, all of my equipment had to be unpacked and inspected. The native porters at the airport were of the Wakamba tribe, great bowmen themselves and as soon as they spotted my equipment they began jabbering excitedly and examined the bows and arrows with delighted grins. One persistent native — after interpretation by my white hunter, wanted to trade a leopard skin for one of my bows.

I was pleasantly surprised to find that my white hunter was an archery enthusiast, himself. His farm in the Keyna highlands is located on the edge of the great mau forest and he keeps several families of Wanderobos on his property. They are without peers when it comes to tracking and bow hunting. From the time they are able to crawl, a tiny bow and

"A fine impala ram that didn't see the arrow coming."



arrow is put in their hands. Their very life is spent hunting in the forest.

My first trip into the forest with them was a revelation. My white hunter and I and two of the Wanderobo warriors with the unlikely names of Meesta and Wambua set out about 4 p.m. one evening armed with bows and arrows. I had examined the Wanderobo equipment with great interest and although quite crude in comparison to my own, it was quite effective as I was soon to find out. Their bows were about 5½ feet in length, completely round and tapered to a point at each end. They were pre-set by being strung all the time, but averaged about forty pounds pull. Their arrows were carried in a skin quiver about two inches in diameter which was slung at the waist and was capped with another piece of skin. The arrows were of all different lengths, diameters and weights with no two being the same. The feathers were about 4 inches long and about a quarter-inch in height and extended all the way back to the nock. They were bound to the shaft with hair from a giraffe's tail. The tips were soft barbed iron or hardwood fitted into a hollow socket at the tip of the shaft. When shot into an animal the point would remain embedded while the shaft dropped away.

I wondered about the accuracy they achieved with this crude equipment, but after watching them operate I noticed two things which indicated that neither accuracy, trajectory nor penetration were of any importance. First, their arrows were tipped with poison,

"The Cape buffalo is one of Africa's most dangerous. I wasn't about to shoot him with the bow."

Another scavenger falls from the African skies, this time a vulture. Author used broadhead and 40 pound bow to shoot this winged victim. His bow outdid the native's.

fatal within minutes to man or beast. Secondly, they are such clever stalkers that their arrows are fired from distances averaging fifteen to thirty feet.

The poison they used was black and sticky like tar and was carried in a little pouch around their necks. Certain members of the tribe make the poison from a formula handed down from generation to generation and the hunters either buy or trade for it. I watched Meesta test the potency of his poison by putting a little daub on the palm of his hand and then, holding his hand in an upright position he made a little cut with a knife on his index finger. As the blood trickled down on the poison I could see the black stain creeping up the blood. Just before it reached the cut in his finger he wiped it off and grinned. The purpose of this maneuver I learned was to find out how fresh or active the poison was. The speed with which it melts and mixes with the blood tells the story. After the poison is exposed to the air for some time it becomes rather firm and will not melt and act as rapidly as when fresh. As we walked along they would breathe on the poison every few minutes to keep it soft and moist. When introduced into the bloodstream it affects the heart, and even though the arrow makes only a scratch on an animal the exertion of running causes the blood to circulate faster and as soon as the poison reaches the heart, down he goes!

They offered some of their poison for my broadheads and were disappointed when I declined.

In addition to their poison arrows, they are master stalkers and trackers. They can look at a single track and not only identify the animal that made it but tell how long since it passed and whether it was a male or female.

We eased along through the forest with the two Wanderobos about fifty feet ahead of us. After about a half mile of silent stalking, Wambua suddenly froze with one foot in the air like a bird dog. A split second later a bushbuck burst out of a clump of undergrowth in front of him with a shrill bark. As quick as a flash Wambua, who had been carrying his bow at half draw, and while still on one foot snapped an arrow that caught the bushbuck in the neck. It was a pure instinctive reflex action, but a marvelous shot just the same. A hundred yards further on we found him. The poison had acted almost instantaneously.

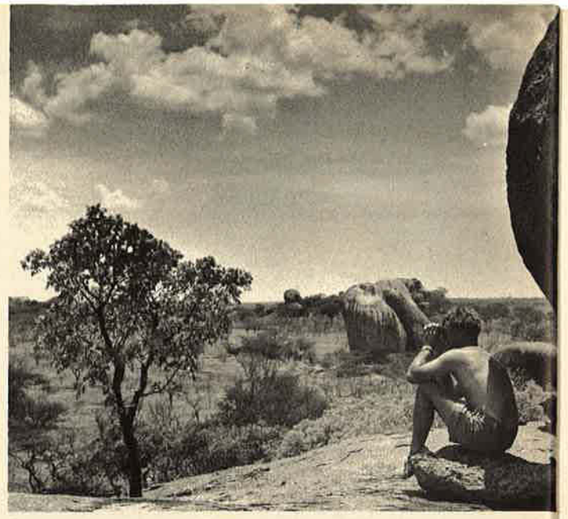
On the way back we spotted some colobus monkeys high in the trees. This time my superior equipment held an advantage for their arrows were not accurate

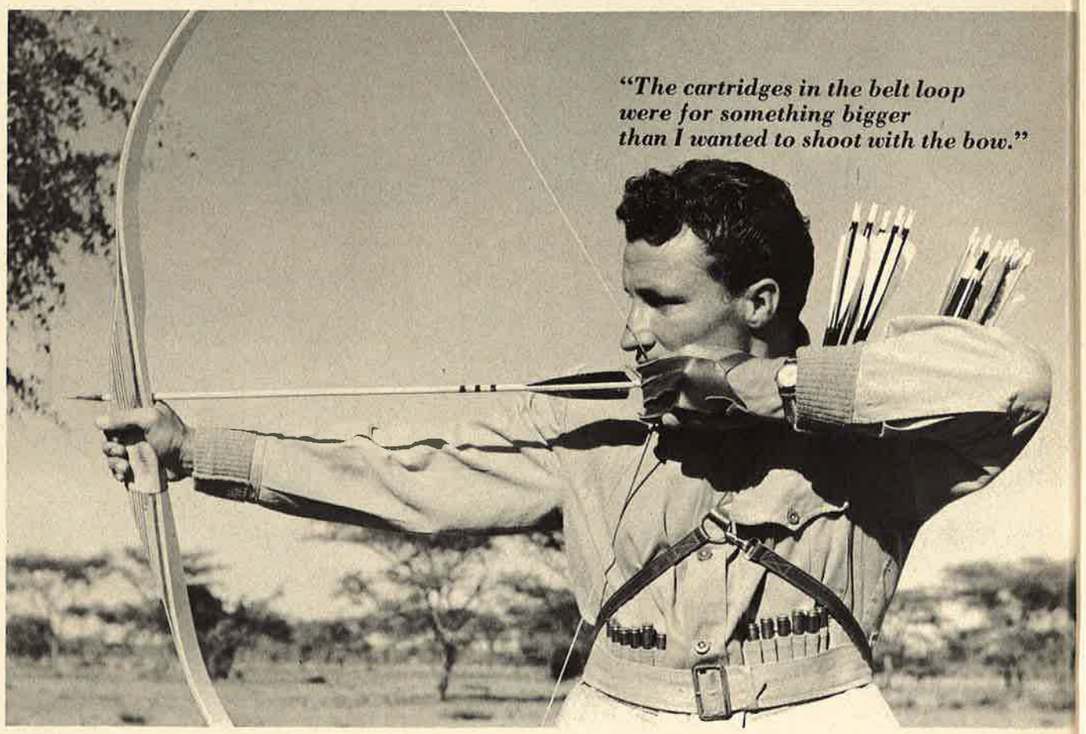
Map shows area in which Gates' safari concentrated its hunting efforts. He took 16 trophies with bow.

Left: Among African native archers, techniques obviously vary; note the differences in how bows are held.

Right: These two Secuma bowhunters use crude bows and poison arrows.

Right: Guide gets some sun in late afternoon while glassing the African countryside, seeking out likely game. Below: The Land Rover is the best transportation for the African plains. Note arrows protruding above the dash.





"The cartridges in the belt loop were for something bigger than I wanted to shoot with the bow."

at that distance — about 75 to 80 feet. We all started shooting and I missed twice then brought one down with the third arrow and another with the fifth. Wambua and Meesta missed several shots each. Later when we hunted the plains country of Kenya and Tanganyika I had ample opportunities to use the bow and great sport it was, too. My equipment consisted of two Bear bows of 40 and 75 pounds pull and the arrows were fiberglass and aluminum tipped broadheads.

After leaving Nairobi, we drove three days down into northern Tanganyika and finally arrived at our first hunting camp late one afternoon, which was located near a small stream. While camp was being set up the cook's helper went down to get some water and I went along with my bow. My white hunter had mentioned that we needed some fresh camp meat and told me to shoot a reedbuck if I could, as the high grass along the stream was full of them.

As we reached the stream bank which was about a hundred yards from camp I saw the head of a reedbuck sticking up out of the high grass on the opposite side. It was an easy shot at about twenty-five yards but with only his head visible it was impossible to tell

"This was Hyena hunting; we drink scotch and soda and wait for them to get closer."

whether his body was turned to the left or right. I guessed right and dropped him.

A few days later, I had an interesting encounter with an impala ram at the same place. He was standing in a little open spot right on the bank of the stream as we came up. The distance this time was about forty yards. When I drew back and released the arrow he jumped stiff-legged about ten feet and froze, still watching us. The arrow passed through the space he had occupied a split second before. He had actually seen the arrow coming and leaped out of its way. I shot twice more with identical results. It was an amazing yet frustrating experience. After the third shot, I decided he had earned the chance to go on living and didn't shoot again. With his attention concentrated on me, I doubt If I would have ever hit him anyway.

Later that afternoon, I stalked another impala and got him with a fifty-yard shot when his attention was concentrated on two other rams that were coming towards him. I soon discovered also that the performance of the first impala wasn't unique. Most of the antelopes could — and did — dodge arrows in flight, usually with the same stiff-legged bounce. In a country inhabited by lions, leopards and other predators who were masters at the art of stalking, most of the antelopes had developed hair-trigger reflexes.

Warthogs were an exception to this rule and provided a lot of sport with the bow. One belligerent boar used to come to a water hole near our second camp every day and would raise a big fuss snorting, grunting and charging any of the smaller animals that came along until he had finished drinking and grubbing in the mud.

Several stalks failed until I caught him pushing another boar around one day and pinned him down with a heavy fiberglass broadhead from the seventy-five pound bow. He struggled a little and the other boar, not realizing what had happened but knowing an advantage when he saw it, pressed the attack. He slashed his dying enemy unmercifully then stepped back and grunted a challenge. When it wasn't answered, he gave him a final slash and stalked away the victor.

Warthogs are like ice cream to leopards, so we hung this old boy in a tree for bait. Three days later when he was getting ripe and tasty, I shot a big leopard out of the tree just as he was reaching for his second mouthful.

Another source of sport was the flocks of guinea fowl and francolin we encountered everywhere. I had brought along two dozen flu-flu arrows and managed to keep the table supplied with these birds.

There was one animal in Africa that I hated with

THE AUTHOR — Elgin Gates: A newcomer to the pages of BOW & ARROW, Gates (pictured at right with Roy Rogers) is one of the world's best known big game hunters. He is holder of several dozen world's records for big game and is a past winner of the Weatherby Big Game Trophy, having been selected for his hunting history and contributions to conservation. However, he also is an ardent archer and his bow and arrows usually go with his big bore rifles whenever he is off around the world to hunt.

a great passion, the hyena. The natives call him *fisi*, a fitting name for this ugly animal. In recent years the hyena and other scavengers have been put on the protected list, but on this safari they still were classed as vermin. I could not stand the sight of these slope-backed, shuffling, horrid, stinking, carrion-eating creatures and I never missed an opportunity to do one in.

Fisi will follow a calving antelope, and when the mother lies weakened by birth pangs, will snatch the baby and make away with it. He will follow the great herds, waiting for a sick or lame animal to drop out, then he will pull it down, tearing out and eating chunks of flesh from the still living animal. He has carried babies out of native huts and eaten them. He eats the old and mortally ill natives that are put out in the bush to die. He will eat other scavengers when he can. In short, he eats anything. He is a cannibal that devours his own mother, brother or sister when they weaken. To the natives he represents all that is evil, dirty and rotten in the world. He is the symbol of death, this destroyer. Sooner or later, everything in Africa ends up in his belly from the mighty elephant down to the lowliest reptile.

Now the average African native simply cannot understand a white man's joke, and while they will not shoot or even touch a dead hyena for superstitious reasons, just let something happen to a hyena and they will scream with laughter and roll on the ground in ecstatic delight. I shot hyenas with the rifle, but enjoyed it more with the bow. A razor sharp broadhead was better medicine for these slimy, arrogant, cowardly beasts.

They would gather around the camp at night attracted by the smell of the skins and horns we had drying in the trees. Early in the safari, they made away with a choice set of kudu horns one night that the boys had forgotten to put up in the trees. We never did find them. The war was on then with a vengeance!

The next night they were back as usual and more arrogant than ever. They thought they had found easy pickings, but I waited patiently until a big dog *fisi* sidled up about thirty feet from the camp fire and sat down licking his chops then I shot him with a broadhead. He snarled and snapped at the arrow and rolled on the ground in a frenzy. In a few seconds the rest of the pack was on him slashing and tearing. Within a few minutes they had devoured him, hair, hide, guts and all. The boys went hysterical with laughter over the whole affair.

A rifle shot would scare them away for about an hour, but with the bow they never quite realized what was happening and as soon as they had disposed of their luckless brother, they would be back for more and I did not fail them. It meant the loss of an arrow for each *fisi* as they would chew it to bits in the scramble, but the price was cheap.

One day, coming back to camp, we caught a *fisi* on the open plain. I got out on the hood of the Land Rover as we followed him and placed an arrow square in his behind. He rolled over snapping at the arrow then ran about fifty feet and repeated the process. We followed him for two miles trying to get in another shot to put him out of his misery. The two gun-bearers and trackers with us simply cracked up with laughter over this performance. For four hours after we returned to camp they kept the boys in an uproar by acting out the whole thing in pantomime over and over again.

Anything *fisi* did while in pain was a colossal, side-splitting funny to them. When an arrow bit into his vitals and he screamed in pain, they would scream with laughter. When he snapped madly at the arrow they would slap each other on the back. When he rolled on the ground in mortal agony, they would roll on the ground in a dilerium of delight. When the rest of the slavering pack mobbed him and slashed him to ribbons they would be reduced to incoherent, eye-streaming ecstasy.

It was the Saturday night carnival, the three-ring circus come to town, the Bob Hope, Milton Berle, Jerry Lewis and Jackie Gleason shows and every other funny thing in the world all rolled into one. They danced and snickered in anticipation when *fisi* came to the bait. They giggled, hee-hee'd and yowled when *fisi* was eaten by *fisi*. Afterwards, they chuckled and chortled with glee and when one would pantomime *fisi* in his death throes they would go through it all again until finally they would all be stretched out on the ground exhausted, helpless, quivering, sniggering, blubbering wrecks.

Personally, I thought it was more nauseating than funny, but however and wherever the source of African mirth and comedy was dammed up, the flood was released and all inhibitions with it the minute they saw anything bad happen to *fisi*.

The second night I used the seventy-five pound bow instead of the forty. Quite by accident, the first arrow I released cut through the vitals of one hyena and went on to impale another one behind him. Thereafter the seventy-five pound bow became the object of the boys' affection. They fell in love with it on the spot. Where previously they had called it *"Uta M' kubwa,"* the big bow, they named it *"Uta m'kubwa mungu kufa fisi mbile ya m'shale moja."* The great king bow, killer of two hyenas with one arrow. It became a magic, supernatural weapon, a *fisi* fetish. They would rub it with respect, roll their eyes in reverence and croon incantations over it. Seldom, if ever, has a bow received so much attention or adulation. Wangi, our number one tracker, appointed himself personal guardian and cared for it like a baby.

In the days that followed it became a ritual. We would finish supper at dusk just as the hyenas began to appear, and the boys would build up the camp fires so there would be light enough to see. Their own fire was about thirty feet away from ours and they would put some of the horns and skins in the ground between the fires as bait. The hyenas would edge slowly closer and closer, licking their chops all the while. When Wangi, our head gun bearer and camp boss, decided they were close enough he would string my seventy-five pound bow and bring it over with some arrows.

"Bwana" he would say with a grin, *"Piga fisi pamoja uta m'kubwa."* Shoot a hyena with the big bow.

"Eko ni mingi?" I would ask him. Are there many?

"Ndio Bwana, mingi kama inzi" he would answer. There are many, like flies.

I would shoot one and the fun would begin. The boys never tired of it and they appreciated seeing *fisi* shot with a bow and arrow. This was something they understood better than a rifle.

At the end of the safari they expressed their regret at my leaving, mainly, I think, because they never had seen their hated enemy *fisi* disposed of in such a delightful way. They would miss all the fun and pantomime and laughing they said, and urged me to come back again and be sure to bring *Uta m'kubwa* — the big bow.

All things considered, it had been a wonderful safari and I assured them I would be back. The elephant, rhino, buffalo and other game I wanted had been bagged, and not counting the hyenas, I had taken sixteen of Africa's big game trophies with the bow.●

One Man Claims, "The Recurve Bow Is Too Sensitive For Accuracy" . . .

Another Says, "Modern Designs Are Far Ahead Of The Old."

LONGBOW VERSUS RECURVE

Friends on competitive front, Doug Kittredge (left) and Howard Hill, both veteran archers, disagree violently on the best type of bow for the top performance we all seek.

By Howard Hill

A bow for hunting must be durable, steady, accurate, gentle in the hand, and smooth on the draw, yet with enough speed of cast and follow-through to throw a heavy arrow. Of these qualities, durability and steadiness are the most important. If a hunting bow is not durable, it is likely to break while the archer is making a shot at game.

If a hunting bow is sensitive and unsteady, it is all but impossible for anyone to shoot it accurately. Most shots in the bush are made quickly, oftentimes while in a precarious shooting position, while the archer is excited, or while under definitely adverse weather conditions. Then, too, the hunting archer does not get shots often enough to be warmed up, and he is usually carrying a bow that is heavier to pull than the one he ordinarily shoots while practicing. Considering all the difficulties which confront the hunting archer in the field, it is imperative that he recognize what he needs in the way of a weapon and unerringly select the proper one for his needs.

A straight-end longbow that follows the string slightly, with good cast, carries a heavy string, is pleasing to draw, and is comfortable to the hand, can be shot much more accurately under hunting conditions than a sensitive bow. It also has much more durability.

Among the hundreds of hunting archers I know, there have been perhaps twenty-five who were really successful bow-and-arrow hunters. Every one of these during his years of hunting has tried short bows, as well as short recurved ones, some composite and some self wood, yet all were forced to admit they were unable to shoot these sensitive bows under hunting conditions with any appreciable degree of success. All the successful hunters I know now use the straight-end longbow, at least for big game hunting.

In 1938, with a couple of friends, Fred Woodley and Bob Faas, I planned a three-weeks hunting expedition into British Columbia. I built a five-foot four-inch bamboo bow for myself. It was of six pieces of bamboo laminated, had recurved ends and a sinew back, and pulled eighty-five pounds.

The bow was so fast it made little difference whether I was seventy or forty yards from the target. The difference in the trajectory at seventy yards was no more than eighteen to twenty inches higher than when shooting at forty yards. The bow had speed and carry-through to burn. It mattered not whether I was shooting the heavier broadheads or the lighter blunt-pointed ones, the bow drove them through the air with exceptional speed and flatness of trajectory.

Finally the day came that found us seven hundred miles up the Fraser River in North British Columbia. Beyond, few white men had ever gone. It was wild and untamed country. There were lots of bear, moose, deer — and more grouse than I had ever seen before. In the bottom land there were hundreds of ruffed grouse, while high on the ridges and mountains there was an abundance of blue grouse and fool hens.

I had gone less than a mile when I ran into a flock of twenty or more fool hens. They flushed from the ground and lit in a thicket of dense spruce trees.

I felt this was going to be easy picking for me and my new bow. It was hard for me to take a natural stance or to shoot without having to squat, stoop, or kneel, because the birds were perched high in the branches of the thick spruce.

After an hour of shooting, gathering arrows, and shooting again, I had shot thirty-eight times had lost every blunt-point in my quiver, and had a bag of four hens. I had done the poorest shooting I have ever seen any decent archer do. I felt like wrapping the bow around the nearest tree, but, instead, I went on the double back to camp, got "Gran-pa," my treasured old straight-end longbow, and a new supply of blunts and came back to the spot where I had left the fool hens.

They were gone, but I ran into a big full-grown mother with twelve young about the size

(Continued on page 23)

By Doug Kittredge

THERE is no doubt that the greatest name in modern archery is Howard Hill. Here is a man who has accomplished archery feats that well may never be equalled. A man with a forceful, vibrant personality who it is impossible not to enjoy being around. A man who has visited every American household through countless movies, books and articles. A man whose successes in the sport of archery make him the recognized leader.

It is a very human trait to follow the leader. To do, ourselves, exactly what the leader does. To use the same equipment. To hope that by such mimicry we too will achieve a similar success.

The controversy of Longbow versus Recurve has come about because of the unusual case of a leader acclaiming the value of a type of equipment which, in actual practice by the majority, is found to be inferior and has thus been rejected.

I personally don't believe this controversy ever will be really settled as long as Howard Hill remains the symbolic leader of archery prowess. There always will be those archers who are not satisfied with their skill and who, in their quest for better results, turn to the leader for his recommendation.

The fact is that the average archer who has been in the sport for more than two years has owned an average of three different bows during his quest for superior performance and increased archery skill. During this beginning period, the archery very likely has owned or seriously tried a Longbow.

Yet the proof of which type of equipment actually proves itself the better performer is the fact that better than ninety-seven percent of the archers who have shot two years or more use a bow of modern recurved design. Ask yourself, "Would this archer have decided on a recurved bow, had a straight end longbow given better results?"

Furthermore, if a longbow design actually were superior in performance, wouldn't at least some of the bow manufacturers recognize this sales potential and have at least one longbow in their line of bow models? The fact is that today there is not even one major maker who produces such a bow design. In the past 10 years several manufacturers have produced longbows commercially, including Howard Hill. Is there a better proof than the fact that none are made today?

Let's take a look at the reasons why this amazing rejection of the "master's" style of equipment occurs.

Howard Hill comes from the old school. He was weaned on archery in the days when to shoot a bow was to show the world that you were some kind of a nut who played around with kid's toys . . . or simply didn't know any better. In that era, equipment as we know it today was non-existent. There were practically no manufacturers of archery tackle, so you made your own. Bows were made of wood and wood as a material demanded that it not be overstressed or fracture would occur. The age-old English longbow design had proven of its worth, was reliable, easy to construct and did the job well.

However, compared with modern fibreglass materials, wood is a grossly inefficient spring material. In the old days, when a man wanted to hunt with a bow, he needed to use a bow weight of at least 65 or 70 pounds — and preferably more — to get the power needed for reasonable flatness of arrow trajectory and deep penetration.

To hold a bow of such high weight requires more than just a loose grip . . . the shooter holds on rather tightly. This bow grip pressure makes it difficult to shoot without twisting the bow limbs out of line slightly with the bowstring, and the bow design which is least sensitive to this bowstring alignment gives the most accurate results.

Through the years, much experimentation was carried out. Short length bows were found to be faster

shooting because the short limbs were bent into a tighter arc with the same draw length. But it also was found that the extra finger pinch formed by the narrower angle of the bowstring made shooting a short bow with dependable accuracy difficult; the extra speed normally was not worth the chance of missing the object being shot at.

Recurved bow designs were known to give great speed. The ancient Turkish bows had the greatest efficiency of any bows known to man and a search always for more speed and flatter shooting trajectory has been a compelling sales argument with archers as it has been with gun enthusiasts. Thus, recurved bows made of wood were developed. It was found, however, that with the heavy weights needed for hunting efficiency and the tight grip needed to shoot such equipment, the early recurved bows were lacking in maximum accuracy.

With the tremendous development of plastics and fibreglass during World War II, bows underwent rapid changes.

Fibreglass on bows was introduced by Frank Eicholtz. The technique of making a bow by gluing several laminations together enabled the bow maker to make whatever shape of bow he wished. The as yet unattainable performance and speed of the old Turkish bows acted as a carrot in front of a rabbit's nose and all sorts of highly curved and stressed bow designs hopped onto the scene. At first, results were poor, but as materials and construction technique advanced, results were astonishing.

Archery was a rapidly growing sport. Many new people were taking it up, but there was a serious lack of real engineering talent as the sport had not yet developed to a point that it would financially support such high priced design assistance. Everything was developed by the "cut & try" method. As today, all bowmakers proclaimed their product to be the greatest. Recurved bows had great speed and flat trajectory, but they often lacked stability and accuracy when shot under hunting conditions. It is no wonder that Howard Hill remained wed to his firm belief in the dependable longbow.

But times have changed. Archery as a sport has become big business. Enough archers now buy equipment for large, well financed firms that the latter can employ the best in engineers to design their products. It has become known what makes a bow stable and dependable, what makes a bow fast, or what makes a bow sensitive to shooting technique variations.

To remain in business, today's bow manufacturer must produce a salable product. The most salable bow is the one that looks the best . . . but even more important, performs the best.

All modern bows are a compromise of desirable features. If a bow maker designs a bow to shoot as fast as possible, he sacrifices the service life, or he makes it difficult, if not impossible, to shoot with accuracy. If he designs only for maximum stability and accuracy, he loses speed and convenience of size.

Today's archer is invariably interested in different phases of the sport and in his equipment; he wants the features most important to success in the particular archery activity in which he is interested. As no one bow can do everything the best, we see a wide variety of bow designs offered the archery public, so the archer can select a bow with features designed specifically for his interests.

Some bows today are designed with the tournament shooter in mind entirely. Competitive shooting demands the utmost in accuracy and the ability to shoot exactly the same shot after shot. The tournament archer can take all the time in the world to make his shot, he can establish his stance, he can aim deliberately. Score is the thing and a few points at the end of a tournament can spell the difference between winning or losing.

His needs in equipment differ from those of the bowhunter, who asks for reasonable speed, but more important, a bow which will be ultra stable so it can be shot with dependable accuracy under the varied conditions found in the field. This shooter doesn't have a chance to warm up before the shot is made.

Archers today can choose between hundreds of different kinds of designs of bows. They can select a bow with any feature desired, or a bow with a blended combination for all purpose use. There are long bows or short bows, fast bows, ultra stable bows, bows physically heavy or light . . . but all of them are recurved!

It's the recurved bow that gives the results. This design feature makes the bow faster and smoother than it is possible to make any straight end longbow . . . yet depending upon the rest of the bow design, it also can be ultra stable and suitable for any bowhunting need.

Take a look at the Jack Howard *Gamemaster,* or the Smithwick *Citation,* both bows built for dependability in the hunting field. A fifty-pound bow in either of these makes gives the flatness of trajectory of an eighty-five-pound bow in the old wood style, yet both have a stable quality that makes it almost impossible to shoot erratically.

Compare these hunting bows with the smooth shooting, ultra fast Hoyt *Medalist,* or Wing *Presentation* . . . tournament bows which are perhaps sensitive to shooting error, but give great speed and flatness of trajectory when used with light weight aluminum tournament arrows.

Today, the archer buys a bow for the purpose he has in mind . . . he may want a hunting bow, he may want a tournament bow, he may want an all purpose bow, but chances are better than 9 out 10 that he will own a bow of recurved design.

The archer who switches to the old fashioned longbow is a man who usually has not achieved the results he wants. He feels that the teachings of the recognized leader, Howard Hill, are worth a try. He soon finds out that what was best in the past, is not necessarily best today and he is amazed to see that the longbow does not have nearly the speed of his modern recurved bow, it is rough in the hand, it does not draw smoothly and his accuracy actually does not increase.●

Kittredge and Jack Howard with Utah deer

Hill with Florida bobcat

(Continued from page 20)

of fry chickens. They lit in another patch of spruce. In less than twenty minutes, I had made eleven shots, had bagged nine birds, had found the two arrows I missed with and was hunting again.

During the remainder of the trip, I never strung that recurved bow again. While on the Canadian hunt, I killed a moose, two deer, more than a hundred grouse, several ducks, a bald eagle and lots of squirrels and rabbits, all with reliable old "Gran'pa."

This experience convinced me of one thing: I am not a good enough archer to shoot a recurved bow successfully under hunting conditions. No recurved or other sensitive bow is the correct weapon for hunting purposes.

There are three distinct types of bows: The straight-end longbow, the short flat bow, and the composite or self recurve bow. Besides these main types there are many bastard designs that may have some feature of one or all of the other types. Of all the varying designs and combinations of features, there has been only one bow developed in modern times that makes a better hunting bow than the conventional English longbow, and that is the American semi-long bow.

This modern type is not quite so long as its English prototype, but is a little wider and considerably flatter. At that, the American semi-long is not so flat as the American Indian short bow, and many times bowyers make the semi-long with recurved ends. However, the recurved ends make it too sensitive for a good hunting weapon.

I know many hunters who swear by the recurved bow for hunting and once in a while these fellows kill a deer, a wild boar or maybe a bear, but for every deadly kill, they have a dozen misses. Any archer who does not make a clean kill once out of every four shots is not doing very good shooting. A good hunter, stalker and shot should do considerably better than that. I am speaking of shots at standing game, of course.

One of the fellows I met had been a state field archer champion for three years straight, and he told me he had made no less than ten shots at deer, none farther than twenty yards away. Three of them he said, had been nearer than twenty-five feet. I could not for the life of me figure what was wrong with his shooting until a few days later, he showed up backstage where I was appearing, with all his hunting equipment.

He had one of the most beautiful, delicate bows, with almost if not quite the fastest cast of any it has ever been my pleasure to examine. It was a lovely recurved osage with a glass back and plastic belly, four feet ten long between the nocks and pulling sixty-nine pounds at a twenty-seven inch draw. The string was as thin and delicate as a flight bow string. His arrows were just as lovely and well made as his bow, but entirely too light, and the broadheads were too short, too wide and too thin for accurate shooting. They were 1¼ inches wide and less than two inches long, with three cutting edges.

I shot some of the broadheads out of his bow into several thicknesses of celotex which we found backstage in the theater. The wide, short, three bladed head windplaned so badly and the bow was so tricky and sensitive that I had trouble keeping the arrows in a three-foot-square target at fifteen yards. Each arrow ducked and dodged like a frightened teal, even inside the building, where there was no wind, not even a breeze. Once or twice I failed to get a perfect loose or I flinched slightly with my left hand, then the bow started going places and the arrows got out of the bow so badly they barely caught the edge of the target, even at that close range.

Now I knew what was wrong with the chap's shooting. No wonder he had never killed a deer! No man alive could call his shots with that equipment, at any distance.

I asked this archer to shoot his equipment for me, so I could watch to see if I could detect anything wrong with his technique. His results were little better than mine, yet his technique was flawless, so far as I could see.

Then, in turn, we both shot my equipment at the same distance and were seldom off-center more than a few inches.

The last time I saw this archer before I left the city, he told me he was making another bow and was getting some properly made broadheads for the next hunting season.

Why archers will go out year after year, get close-range shots, continue to miss their deer, and still stay with short recurved bows and improperly constructed arrows is beyond my comprehension. Maybe the beauty of such bows and the music of the delicate strings is more pleasing to such hunters than delicious juicy steaks broiling over the campfire, but I prefer the steak.

I have been asked this one question thousands of times: "Why don't you use a recurved bow?" I can answer without hesitation: *I am not skilled enough to shoot a short recurved bow accurately.*

This simple statement is not meant as a jest; it is the straight truth, and I am not ashamed to admit it.●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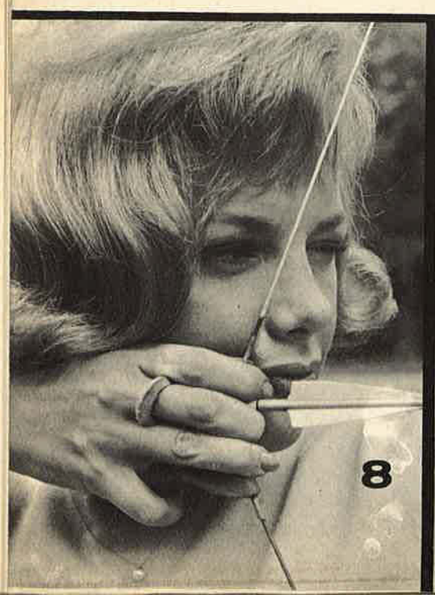
POSITION OF WRIST AND HAND prior to draw. In Figure 6, wrist and hand both are straight with the elbow level, causing draw to be made with back and shoulders. This rolls string and arrow against the side of the bow, rather than away from the arrow shelf, thus keeping arrow on the rest.

POSITION OF ELBOW during draw: Figure 7 shows that elbow should be level, in line with bow arm and shoulder section. This creates a straight line which, in turn, enables the archer to release in line; shaft necessarily flies in line.

ANCHOR POINT, HIGH AND LOW: Figure 8 shows the high or cheek anchor. This is attained by using the web or cup formed by thumb and index finger, placing this cup in the area of the jawbone with index finger touching the corner of mouth and the thumb rest under jawbone. Figure 9 shows low anchor. This is attained by drawing under the chin with chin and jawbone resting on top of hand and index finger, the string touching center tip of shooter's nose. This gives a two-point anchor that leads to stability and consistency.

TAKING A BREATH prior to the draw and elevating of chest, the shooter will note ease with which the bow can be drawn with powerful part of the body, the chest and back. This not only makes the draw easier, but definitely leads to fuller stability and control of shot by the archer.

ALIGNMENT OF BOW ARM AND RIGHT ELBOW: Figure 10 shows the importance of basic alignment. It is comparable to leaning against the edge of an open door. If we lean directly in line, the door will support our weight, but the moment we move to one side, it will collapse, throwing hand and body to one side. Situation applies to bow arm, elbow.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PHOTOS BY MILT LEWIS

METHODS OF RELEASE: Figure 11 illustrates the finger point method. This is easiest for beginners and is closely related to trigger squeeze in shooting a firearm. All the shooter has to do is point the index finger of release hand at target, causing other fingers to follow simultaneously.


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Figure 12 shows the relaxed forearm method. This requires concentration and is one of the fine points in obtaining perfection. Here we deal with transfer of thought command to muscles of the forearms, causing them to relax, and fingers, in their turn, to release the arrow in unison.

FOLLOW-THROUGH is shown in Figure 12. Two reasons of value in follow-through are assurance of no movement during shot to cause loss of line or elevation, and if you move out of position, you have lost all association with shot and have no way of knowing why arrow went high, low, right, left or in the middle. We learn more about form and technique after the arrow is gone than during shot, if we stay in position.

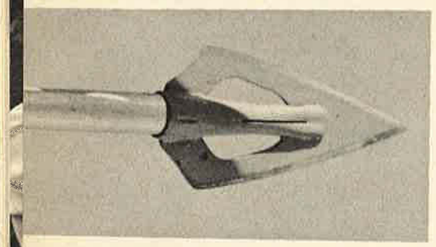
RECOVERY AFTER SHOT: When arm is in an up or loaded position with shoulder muscle under tension, we are burning the muscle. The only way this muscle, arm and shoulder can rejuvenate its energy is through circulation. A few seconds in the down, relaxed position adds to your strength and composure prior to lining up for that next shot.

NEXT ISSUE: BEGINNER PROBLEMS


12

A Bear For Tiger

The Striped Demon Is A Test Of Any Equipment — And Of Men As Well.



Used against the huge jungle cat was a Bear Razorhead arrowhead such as this, which was mounted upon a Sila-Flex fiberglass shaft.

(Fred Bear, president of the Bear ***Archery*** *Company in Grayling,* ***Michigan****, went to India for tiger,* ***but unlike*** *most hunters, he meant to score with bow and arrow. Now he's back, and his trophy is getting special care from one of the nation's top taxidermists. It eventually will join other Bear* ***trophies such*** *as a half-ton* ***kodiak****, a* ***grizzly*** *bear, mountain* ***goat****,* ***moose, elk****, caribou and a* ***variety*** *of* ***African*** *game, all fallen* ***to his*** *dauntless bow.)*

IT was the damnedest snarling and roaring I've ever heard.

That's how I can best describe the sound and fury of a mortally wounded Indian tiger.

First, Indian tigers are known as one of the world's most ferocious carnivorous beasts. Indians know only too well their man-eating proclivities.

Second, the tiger I'm talking about is a female — the deadlier of the species as any male knows. Third, this tiger weighed three hundred pounds — big enough to do in the biggest brownie or grizzly in about a half a minute.

I bagged this tiger in hilly, almost mountainous country about ten miles east of Bundi in the State of Rajasthan, some 130 miles southwest of Delhi. I was the guest of Maharajah of Bundi, who with his aide-de-camp, backed me up with a .375 double and a .375 Browning. Also a guest of the 43-year-old Maharajah was Bob Halmi, Life Magazine photographer.

After several false alarms and nine days of baiting, patiently stalking and waiting for tigers, we finally got our chance.

At 10 a.m. Saturday, we got word that a female tiger and two two-year-old cubs were feeding on a bait about ten miles away. We left for the area.

The tigers were at the head of a draw, having a canyon-like wall on one side and a steep hillside on the other. Unfortunately the tigers were sleeping too close to the *machans* (platforms) which had been erected when the bait was placed, so we had to build new ones.

I was alone in the first machan, nine or ten feet up on the stub of a thorn tree. A well-used game trail went near me to pass under the number two machan about thirty yards away and supporting Bundi and Halmi. Other trails passed on both sides — all through dense thorn bush about six feet high.

The beaters, about sixty, formed a semi-circle strung out part way up the mountain along the sides of the steep canyon walls. A few had muskets. The beat started. Much yelling, firing of guns and rolling rocks into the thick bush below. We were only about three hundred yards from the tigers. I fully expected them to come out on the trail almost under me. The beaters did not move much. Just yelled and rolled rocks.

After about twenty minutes, I saw the big cat sneak along at my right on the edge of the steep mountain about seventy yards away and start climbing slowly in a zigzag. It was too far for me, eighty yards at least, and I expected Maharajah Bundi's gun to blast out any minute as the cats must be killed. The only reward for the beaters is to have the cats killed to save their cows, camels and goats. Bundi had told me that he would not allow them to escape if it could be prevented.

Apparently her young were in the bush below. I could not see and she did not climb farther but paced back and forth at one spot. I could see her only momentarily through the brush. Fifteen minutes went by. Maybe this was the only shot I would get.

My first arrow looked good but struck behind her. She changed ends quickly as only a cat can do. We never went up there to see, but I think she chewed it up.

I really never expected to hit her at that distance — or through the brush, but my second arrow looked very good all the way and there was the damnedest snarling and roaring that I ever heard. She spun around two or three times and then headed straight down into the bush between me and the hill and stayed in that one spot growling and roaring.

About the time that she disappeared in the bush Bundi shot and I thought: blast it, there goes my trophy! I looked at His Highness then for the first time and he was shooting back of me at a cub that was streaking back toward the beaters. As I learned later, *nobody saw the cat I shot at any time.*

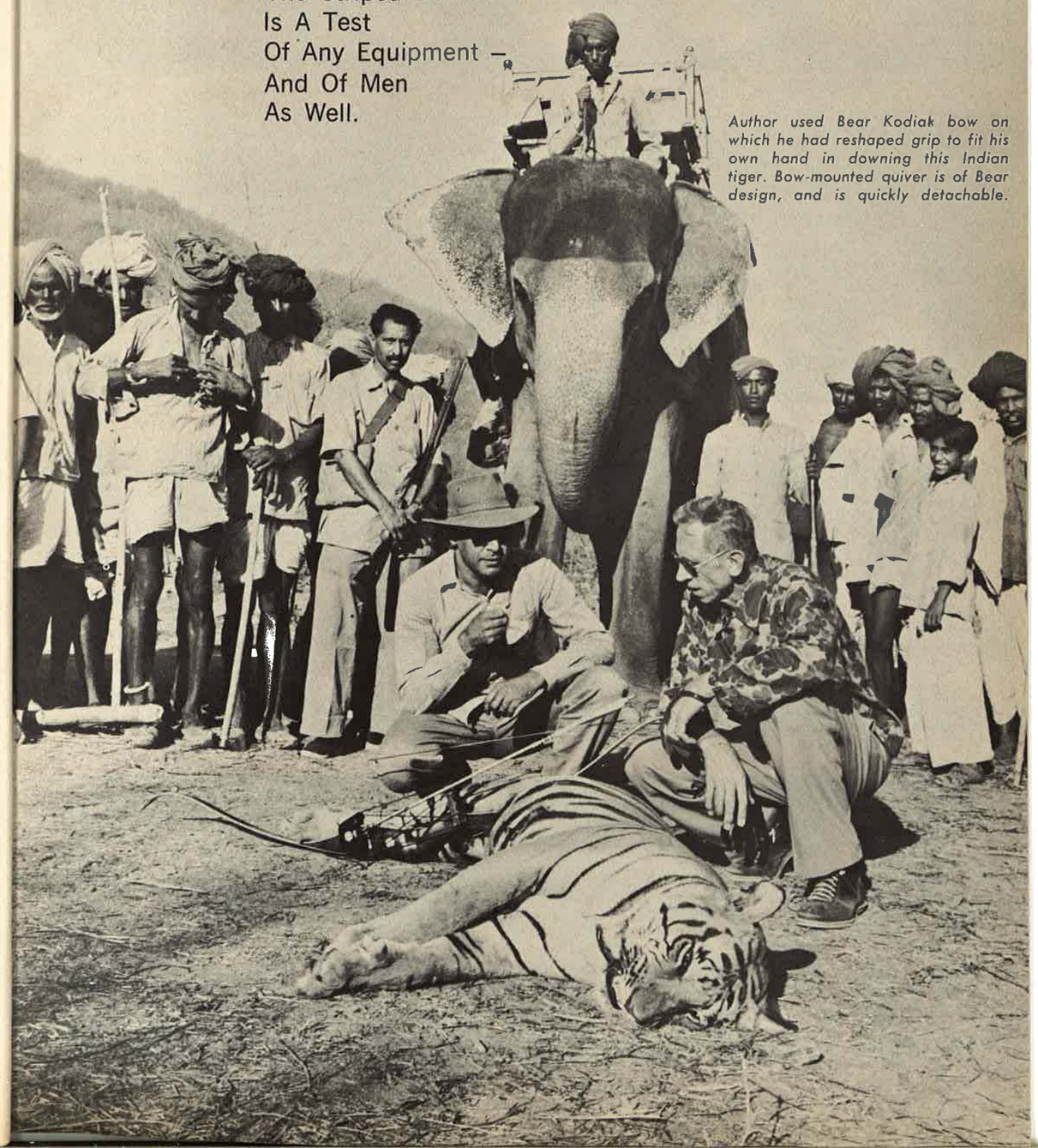
The rumpus she was making now left no doubt as to where she was, but happily nobody could see her (or a gun shot would have spoiled my bow and arrow trophy). Nobody ever goes into thick bush like that after a tiger in that state of mind. They are savage and would stop at nothing when worked into a frenzy.

After what seemed much longer than it really was, the terrible roaring stopped. Meanwhile the beaters had stopped; they would not advance. Much talking now between His Highness and the hunters in native tongue. I did not know it at the time and did not see him, but Bundi sent his top tracker into the bush with a big double. He found my cat dead. Word was flashed to the beaters that the big beast was dead.

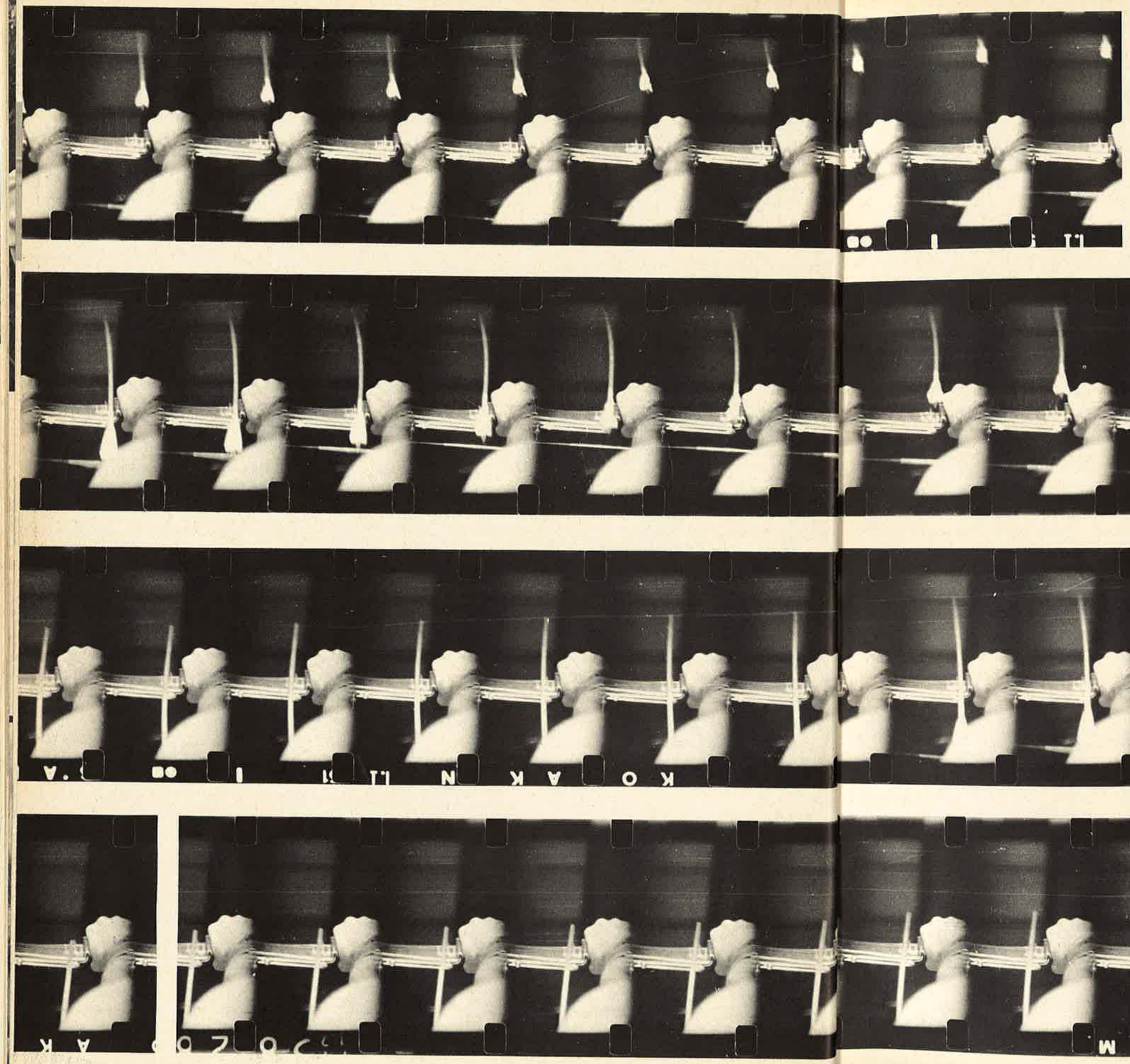
Now the beaters and hunters gathered around us. I picked my way down the thorn tree and was led into the thicket on hands and knees. Much blood about a small area, and between a rock and a tree, my tiger.

The tiger weighed about three hundred pounds. The arrow had gone through the liver area and was not found as the sun was settling behind the mountain and there was work to do before the light faded.

The tiger was carried out on poles and dropped in an open area where pictures were taken. Rosie, the elephant, took vengeance by several husky kicks, then trumpeted. Everybody was highly elated.



Author used Bear Kodiak bow on which he had reshaped grip to fit his own hand in downing this Indian tiger. Bow-mounted quiver is of Bear design, and is quickly detachable.



These high speed pictures, taken at 2000 frames per second in a space laboratory by the author, illustrate the flight of the arrow leaving the bow, and action of the string following the release.

SPINE & ACCURACY

SLOW MOTION FILMS SEPARATE THEORY FROM REALITY!

By Jim Easton

THE "spine" or stiffness of an arrow shaft is the most vital physical characteristic of an arrow. It is the amount of stiffness that determines whether an arrow will fly "cleanly" from a given draw weight bow. It is this initial flight, the first few feet after the string is released, that determines the direction and accuracy of the arrow that has been shot.

All of this, of course, is great so far as theory is concerned and can be proven with involved mathematical formulae. However, it seemed to me that actual study of the arrow and its characteristics in flight could do more to offer proof than technicalities not easily understood by the average bowman.

The obvious answer was slow motion films, but these would have to be *very* slow if we were to make a proper study.

Through the contact of Dave Benedict of Canoga Park, California, we had the opportunity to use the facilities of one of the world's finest space research environmental laboratories in conducting some preliminary tests.

These tests, however, were more to check out camera lighting and other physical aspects of the planned future tests than actually to obtain specific results. Dave also performed tests on his uniquely designed cross-bow, checking out the action of the string lock and string to nock contact.

But before attempting to explain the initial flight of an arrow, let us define the term *spine* as it is commonly used in the United States.

THE SPINE of an arrow is a measure of its stiffness. The degree of stiffness (resistance to deflection under a load) of an arrow shaft is determined by its cross-sectional configuration and shaft material. Given the modulus of elasticity of a specific uniform arrow material, and measuring the cross-sectional configuration one can compute this stiffness or degree of deflection for any load on the shaft.

Since the end loading of the arrow by the bow string when the arrow is released is related to bending it as an end supported and center loaded simple beam, spine

Jim Easton, who authored this technical article, is one of the modern proponents of a scientific approach to archery, utilizing new knowledge to improve the sport.

values are compared by the following method for convenience and simplicity:

A STRAIGHT ARROW SHAFT is supported at two points one-half inch from the ends of the arrow. A two pound weight is placed on top of or hung from the center of the shaft. The amount of the deflection caused by the application of the two pound weight is measured in thousandths of an inch. This value then is defined as the *spine* of that length arrow shaft.

All size shafts of any material can be compared with each other in this manner. A stiff shaft suitable for a heavy bow has a lower spine value than a week spined or limber shaft suitable for a light bow. Although different arrow materials may have the same spine reading, some variations in initial flight can be noticed due to different frequency of oscillation of the bending shaft for various materials.

The numerical values of the spine readings mean nothing in themselves but are merely used as a comparison, although some coincidental relationships appear that allow quick rule of thumb correlation with bow weight-arrow spine combinations.

An arrow shaft with a spine reading of .500" ±.030" generally is suitable for a 50 pound bow. For each pound of bow weight approximately .010 inches of spine should be added or subtracted. This over simplified rule only holds good for a narrow range of 10-15 pounds on either side of the fifty pound figure.

Beyond these limits, a lighter or heavier bow is less critical to spine values. Not every archer can shoot the same bow weight-arrow spine combination successfully. Many variables must be considered in explaining why spine can not be predicted directly from bow weight alone, and some will be listed below:

TYPE OF RELEASE — A clean, low draw release imparts more of the energy of bow to the arrow and requires a stiffer arrow. The amount of movement of the hand away from the face when releasing will also be an influence.

(The degree of build-up of a bow from a true center shot design will require differently spined arrows.)

SPEED OF THE BOW — The design of the bow limbs influences arrow speed. An extremely fast bow requires a stiffer arrow than a slow one would require. Also, the limb design and mass may cause variations.

GRIP ON BOW — A tight grip will slow down the speed of a bow and an open, loose grip allows the bow to operate at its full efficiency; a high wrist grip versus a flat hand grip changes the limb tiller or contour at full draw, and can require differently spined arrows. The torque put into a bow by various grips is necessary for proper arrow flight, but the degrees of different grips could require differently spined arrows.

The height of the string brace can be another cause of different spine requirements. There are also many other small influences on arrow spine requirements for a given bow weight and all these problems are related to the motion the arrow takes in order to leave the bow without striking it.

INITIAL ARROW FLIGHT is a complex series of events, but with the aid of some of the photos available and a brief description, some idea of initial flight can be visualized.

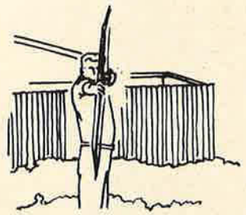
The problem of initial arrow flight has been studied as long as man has shot the bow. An excellent summary and comment on this is available in Dr. Robert Elmer's fine book, *Target Archery*, which is recommended for anyone interested in prior work on initial arrow flight along with a history of archery in the United States in general. Included in it are some of the 19th and 20th Century tests, along with mention of relics, showing experimentation on initial arrow flight of many centuries ago.

The initial flight of an arrow often is referred to as the "Archers Paradox." This paradox of an arrow's flight can be readily understood, if one visualizes a bow and arrow in a full drawn position and notices the angle the arrow makes to the line of aim when observed from directly above. It would appear that the shaft will fly to the left when shot. The fact that it does not is the paradox referred to as the "Archers Paradox."

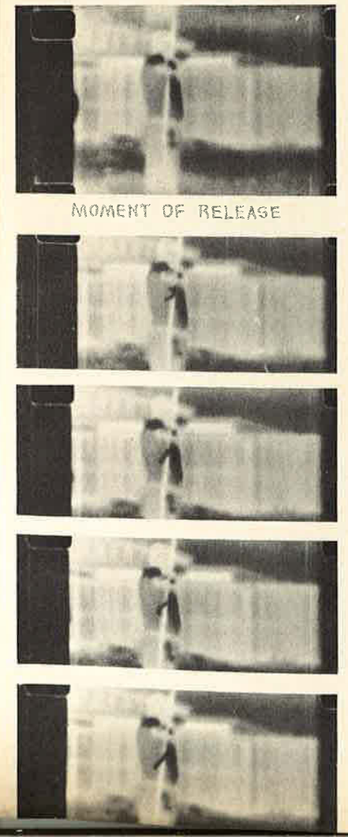
SEVERAL FACTORS are involved that cause the arrow to hit the point aimed at when shot. To explain these actions we will attempt to explain the first few feet of an arrow's flight

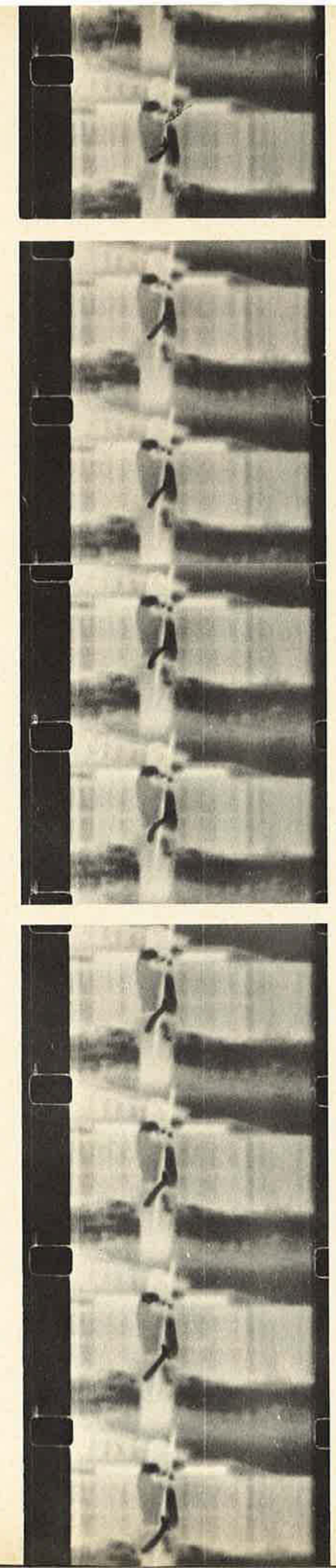
For a right handed archer, as the string is released, the arrow shaft will bend concavely left due to the motion of the string when it rolls off the finger tips and also due to the inertia of the shaft, itself, and the pressure against the side of the bow.

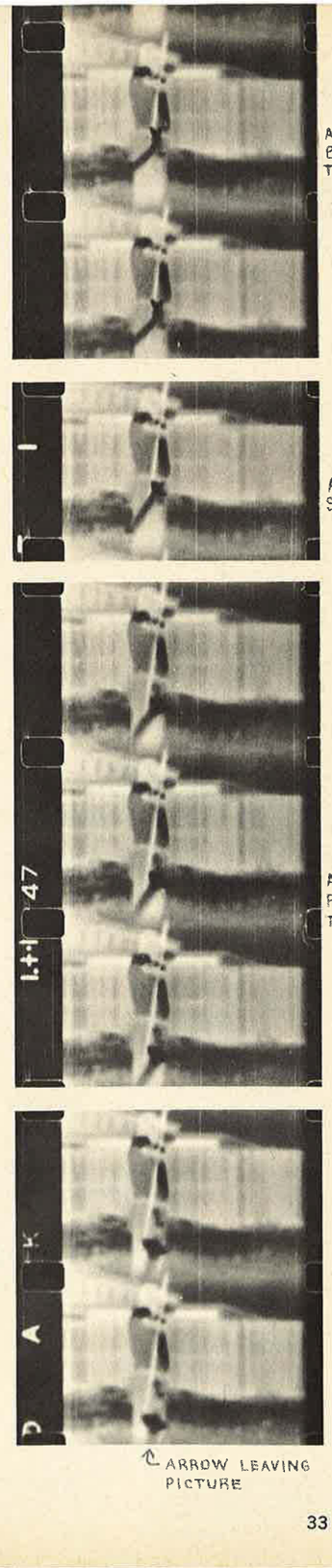
As the arrow continues in its path, it will continue its flexing and change to a concave right bend. After the initial side thrust at the moment of release, the shaft is clear of the bow, and only as the arrow leaves the string, does it in some cases (depending on its spine and method of shooting) touch the bow. *(Continued on page 64)*



This series, reproduced from a film positive, shows the action of an arrow after leaving the bow. Note the high degree of whip. Photos were taken at 4000 frames per second by Dr. Wayland Marlow to illustrate flexure of a properly spined arrow.

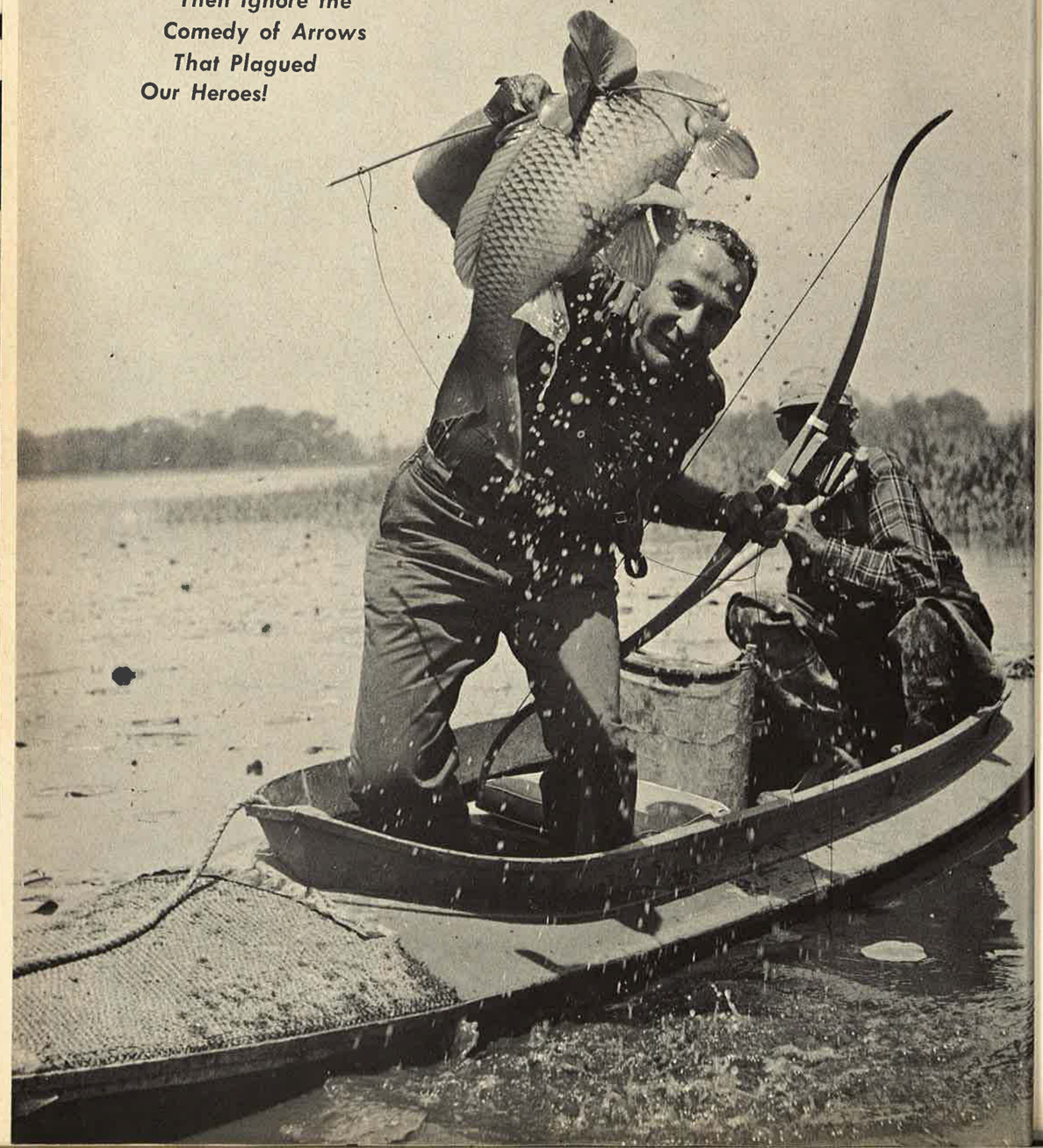






SHARP CARP, NARROW ARROW

If You Want to Shoot Fish, Glean This Article Carefully — Then Ignore the Comedy of Arrows That Plagued Our Heroes!



BY MARTIN HAYNES

IF you're a fisherman, you may not go for bow-fishing; the same goes for the avid archer. There is something about driving arrows into several feet of water at a two-foot carp, who may or may not be where you're aiming, that leads to major frustrations.

Jim Wallace is both an avid archer and an ardent angler, but never had tried to combine the two until Doug Morgan invited him along for what he promised to be an action-filled weekend on the Colorado River, which separates Arizona from California. The fact that the two states are constantly haggling in court, and out, would lead one to believe that this mass of water divides them emotionally as well as geographically, but that's another story.

The weekend was action-filled as promised, but a lot of it had little to do with impaling carp on the end of an arrow. In reality, it turned out to be a comedy of errors — or, more realistically, a comedy of arrows.

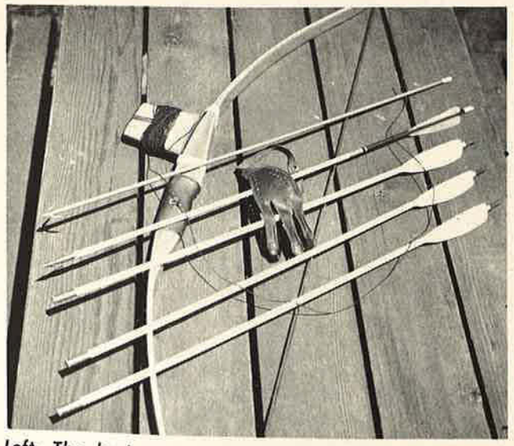
You may immediately wonder why one would choose carp as the targets for his arrows, since this is one of the most unpopular species found in fresh water and certainly is frowned upon for eating. The chief reason, of course, is the fact that this is the only fresh water fish that the California archer is allowed to take with bow and arrow. Also, this particular fish is fast, shifty and gives the archer a good run for his arrows.

In Needles, a California community virtually on the bank of the river, Courtney Boom, one of the town businessmen had told Wallace of the carp fishing potential in the back waters of the Colorado that lie on the Arizona side.

These back waters were formed when the course of the river was changed to channel it closer to the town. A portion of the original stream still seeps through some seventy-five square miles of channels, small ponds and a few small lakes.

Most of these channels, are about fifteen feet in width and from three to five feet in depth. There also are numerous beaver dams, and here the depth will run as much as fifteen feet and the waters bear bass and catfish.

Trying to make as much out of a two-day weekend as possible, Morgan and Wallace drove through the Colorado and associated deserts at night to reach Needles, where we put up at the Hyatt Chalet Motel. The next morning, Courtney Boom and a guide, Kenny Baldwin, met them for breakfast and over steak and eggs the latter told more about the back waters area

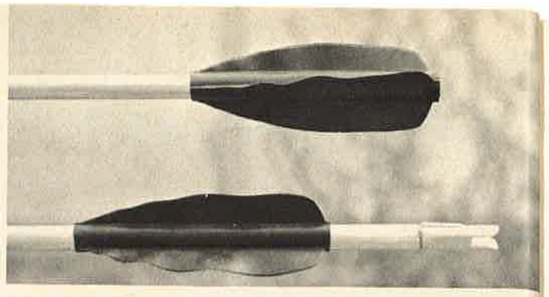


Left: The lowly carp presents a challenge to the bow fisherman and makes a tough target. (Above) A variety of arrows and equipment may be used in this sport, but the cost is still low after one has his basic equipment.

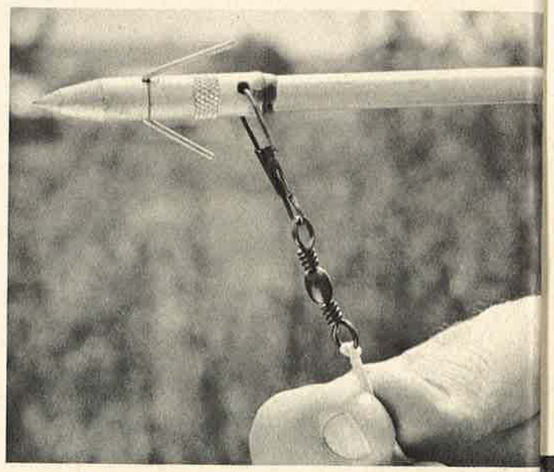
Doug Morgan, one of the heroes of this opus, has the look of a riverboat carp shark as he displays a portion of his day's take from backwaters of the Colorado River.

on the Arizona side of the river. They would be doing at least some of their bow-fishing in small but shallow lakes, he explained, and would be using a twelve-foot flat bottom boat of aluminum. There is little room to maneuver a larger, heavier vessel in the narrow channels, and they probably would have to carry the boat over the beaver dams blocking the way. Also taken along was a five hp. Johnson outboard motor, which he said was well adapted to the area.

The boat and motor had been hauled on a truck. Now began the chore of getting it into the water, and



Above: Morgan was trying a new type of rubber fletching that slides on over arrow shaft and is not affected by water. (Below) Aluminum shaft was drilled with tiny hole to discourage flotation, line was inserted in hole.



that was where Wallace made his initial mistake of the day — second mistake, if you want to include coming at all. The underwater walls of the channel are steep and slippery, and although the water was deep, it was icy cold!

In launching the boat, he was carrying the front of the lightweight skiff, moving backwards toward the waters edge. Then came that fatal step that sent him plunging into the shallow depths, the full weight of the boat on top. After several moments of breathless scrambling, he managed to get separated from the metallic bottom.

If you have ever tried to get three men, two bows, two sets of arrows, a pair of cameras, assorted lunches and a motor into a skiff this size, you know why they make larger boats.

Moving up the narrow channel, they saw fish moving away. It was almost as though they were herding them; as the boat moved up the waterway, all of the fish would move ahead.

At the first beaver dam, there were about twenty carp swimming in confused circles, and as the boat drew still closer, one huge carp — a leader, if there is such a thing as rank in piscatorial circles — darted

Although bow fishermen started off using reels on their bows, they soon found that they were unnecessary in the shallow dammed streams where shot fish couldn't escape.

through the water, making it past to safety. This started a stampede or whatever it is that fish do when they're in a hurry.

Finally, there was only one fish left and he seemed in no hurry to escape. This would seem an indication that he was lazy, overfed or just plain stupid. On the other hand, he may have been an individualist, who refused to conform and escape just because the others did.

This carp simply lay close to the bank until the bowmen were virtually on top of him. Then, he shot

Above: Morgan tries a shot while wading and stalking his fish. Note that lower limb of the bow has struck water. Below: Flat-bottom aluminum skiff is used in shallow water. Arrow is blurred as it leaves Browning 65 lb. bow.

to the other side of the dam, doing the same thing: Hugging the bank as though attempting to blend with the submerged growth. This went on for several minutes, until they tired of the chase and pushed the dam boat over the dam and into the next channel.

Once back in the water, Ken suggested that one of the immigrants get into the bow of the boat and try a few shots. Morgan scrambled for the position, and as he got into position, Ken cut the motor and used the oars, dipping them as lightly as possible as they slid toward the next dam.

As before, there were carp that moved downstream in a flood of silver scales. Morgan, meanwhile, was having his problems. Perched precariously in the bow, he was having trouble in maintaining his balance.

The largest carp of the expedition started past the boat, still swimming lazily as though daring them to take a shot at him.

Doug was using a reel on his bow, equipped with about fifty feet of line. In the confusion of getting the gear into the boat, his line had tangled on the reel. Now, as the big carp swam past, Morgan took careful aim at what appeared to be a cinch shot. The bowstring vibrated as the arrow was loosed, then pandemonium set in.

The arrow shot downward toward the target — but so did Morgan. The arrow drew the line tight on the reel, and Doug, already offbalance, was dragged into the shallows.

It took several minutes to get Morgan, cursing roundly, back into the boat. The laughter didn't improve his mood any, but it did improve his swearing. The fact that he had missed the fish, too, didn't help.

Several more shots were made with bow-mounted reels, but there was more line than there was pond. And since the water was shallow, dammed at each end by the beaver dams, the reels were unnecessary. They were removed.

Morgan was using a Browning bow with a 64-pound pull and Easton XX75 2020 aluminum arrows. He had drilled a hole near the tip of each of the shafts to release the air and relieve flotation. Wallace was using a Colt *Huntsman* and the same type of arrows. However, his shafts were equipped with standard hunting broadheads, while Morgan used special fish tips.

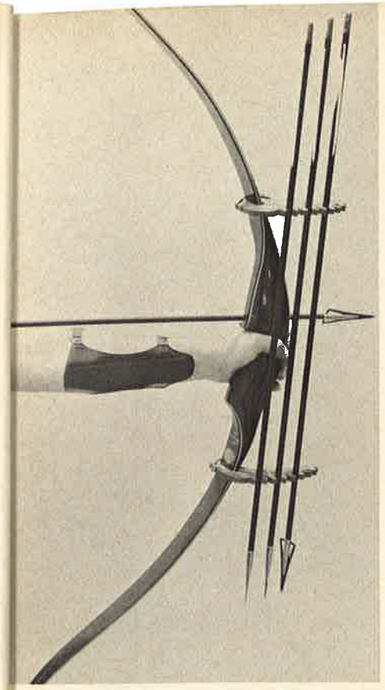
Moving up the channel, the bowmen could see several fish moving directly ahead of the boat, Morgan had a Kittredge hunting sight rigged on his bow, and came through by making a hit with his second arrow, then his third — and so on into the night.

(Continued on page 40)

BUYERS' GUIDE:

SILENT HUNTING QUIVERS

The new King Silent Stalker has that Quiet Earp look in that it can be tied down like a sixgun so that you know just where your arrows are at all times, or if you're creeping or stalking, let it hang; $9.95.

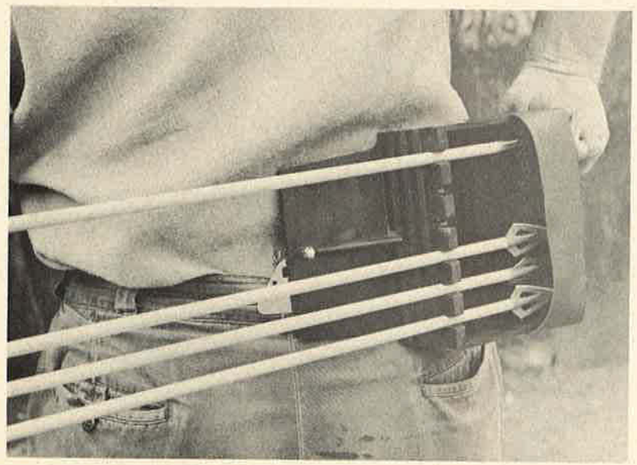


The National bow quiver is one that you can put on or take off without removing bowstrings. It holds four arrows even after removal for $2.95.

Karri Arrow Quiver was designed by Jack Meiling up in Provo, Utah, and is carried on back so arrows are drawn from side; no rattle $12.50.

Saunder's new "BQ-8" holds eight arrows. Features: adjustable length and arrow clips, rubber coated bow clamps, full guard, Price: $11.95.

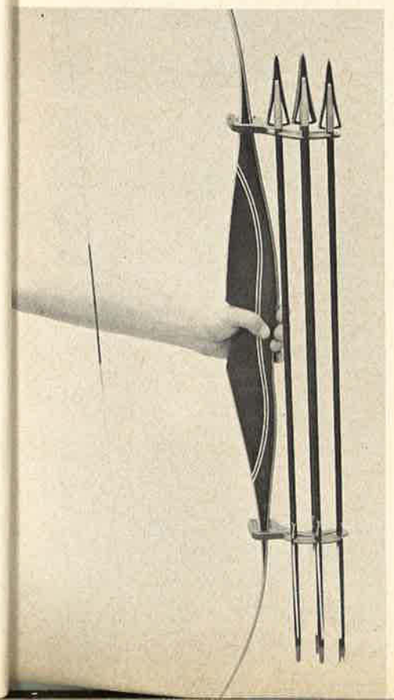
Jack Howard's new Brush Quiver hangs in the rear, where it is less likely to come in contact with underbrush, yet, as shown above, it can be easily swiveled in any direction as an aid to silent movement. $12.95



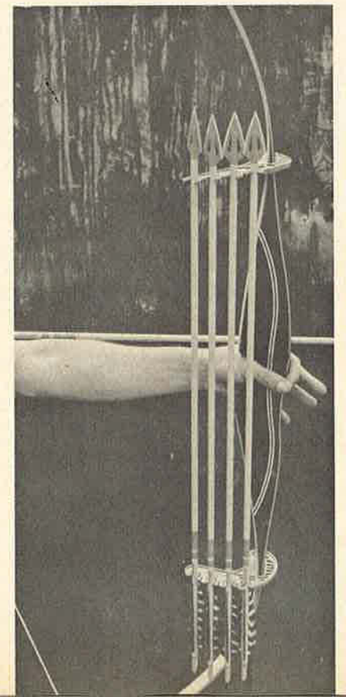
Farley bow quiver is held in place by thumb screws. Holds five arrows in metal clips; made of maple, saddle leather for heavy use. Price $10.95.

If Stalking's Your Meat, These Will Keep You From Heralding Your Approach

The Kwikee Kwiver requires no cutting or fitting. It's made of heavy Dupont neoprene for wear, and the spring clamp gives good grip. Price $3.50.



If you can pronounce this one, you may get one free. More seriously, it is the "Hush-h-h" and simply slides over the limb; holds four for $2.95.



And this one looks like a hood for a hanging, but it's the Bear St. Charles which enables you to carry arrows, protect fletching: $12.50.

BOW FISHING

(Continued from page 37)

It may have been his use of the sight, or simply the fact that he had done more of this type fishing, but Wallace found that scoring was not easy, and made several shots before hitting the first carp.

Depending upon the angle at which the sun is hitting the water, there is a deflection of light rays; they tend to "bend" upon hitting the surface. As a result, the fish is not actually where you see it. One has to learn to compensate or "lead" his game. Also, they found that as the arrow hits the water, it deflects upward; the deeper one is shooting, the more the arrow will deflect until it stops traveling.

Shooting most of the time into about three feet of water, they found that if one aims just *under* the fish, he is most likely to get a hit.

At the end of the second channel, the skiff entered a small pool that measured thirty-odd yards across and was about two feet deep. Here, Morgan and Wallace clambered from the boat and tried wading and shooting. Considering the deflections, et cetera, earlier discussed, this may sound like a damn good way to get one of your arrows through your own foot, but it turned out to be a ball.

The boat handler joined them and the trio spread out across the lake on a frontal line and began to move across the lake, maintaining interval to drive the carp ahead. Near the bank, there were perhaps thirty fish swimming about, trying to find a way between the three, but not daring to make the run.

One carp tried to make it, and Wallace made a quick draw with the bow but missed. The entire school of fish followed this leader. Jim drew another arrow, missed again, then looked up in time to see Doug Morgan sink a shaft through a carp's head. The latter quickly nocked another arrow, drew and pasted a second one to the bottom.

By this time, the water was so thick with fish making for safety that it was hard to pick a specific target. Standing there, knee deep in water, they could feel fish bumping their legs as they darted past. Within those few exciting moments, Morgan hit eight of the carp and his partner managed to bag three.

Another channel led into a deep pond, where Wallace spotted some of the largest bass he had ever seen. There were carp here, too, but they were running deep. The few shots tried were to determine how the arrows would react. The conclusion was that the shafts offered good penetration only through about six feet of water. But it also is harder to judge your aim and your chances of hitting one beyond five feet are virtually nil.

Heading back to where the truck had been left, they attempted to keep the carp on one side of the channel and crowded against the bank. Although the fish proved less than cooperative, they managed to get in several shots. The arrow usually would go completely through the fish and imbed itself about a foot into the sand of the underwater embankment.

Once on shore, they found that they had gotten an even two dozen fish. It was 102 on the river by then, and our heroes were in favor of finding the tallest cool beer in that vicinity of the desert.

But suddenly there was a sound within yards of what sounded like a gunshot. Not knowing what was happening, both men hit the ground, accusing some idiot of sniping in the surrounding brush.

But they raised their heads high enough at the next sharp report to see the guide standing knee deep in the water, an oar in his hands. After he slammed it down against the surface once more, he reached down to pull out three giant carp — all larger than any previously taken. ●

bows of the sons of the prophets

MOHAMMED RAISED PROFICIENCY IN ARCHERY TO STATUS OF A RELIGIOUS DUTY!

BY COL. ROBERT H. RANKIN, USMC

THE oldest of projectile weapons — the bow — also was the most widely distributed in use. This weapon has been known since time immemorial, with evidence of its use as long ago as 7000 B.C.! References to the bow are recorded in the ancient military history of many lands, including China, Japan, India, Russia, Switzerland, France and England. In the storied days of Nimrod, archers were the vaunted pride of the Assyrian kings. More familiar to us, perhaps, are the legends of the famed long bowmen of Merrie England.

In view of the prominence which this weapon has achieved and the vast lore which has been built up about its use, it is interesting to note that undoubtedly the best bows ever made were the composite bows of the old Mohammedan nations. Small and light, they were designed to propel arrows with considerable force over great distances. The making of bows was a highly esteemed craft and many Sultans prided themselves on their personal mastery of the craft. Mohammed himself raised proficiency in the use of the bow to the status of a religious duty.

Unfortunately for the military historian, the origin of the Turkish bow is lost far back in the dim reaches of antiquity. Interestingly enough, however, bows are pictured on the earliest pieces of pottery and are spoken of in the earliest written accounts. From all that can be learned, there was little change in the bows through the years. We know, of course, that both foot and horse archers made up an important part of all Ottoman armies.

The typical Turkish military bow was a composite affair of very flexible wood, horn and sinew, some thirty-six inches long, although the bows used by mounted archers were shorter. The frame or core of the bow was of wood, varying from some three-quarters of an inch thick at the center to a quarter of an inch or even less at the ends. Particularly tough wood was used for the handle, the center section, while elastic flexible wood was used for the limbs. After the three pieces of wood had been glued together they were heated and bent to shape. Very flexible horn and sinew then was applied and glued in place, first being softened in extremely hot water. Approximately three inches of wood was allowed to project beyond the sheathing of horn and sinew at each end of the bow. These projecting ends were large enough to allow the cutting of nocks to accommodate the bowstring.

Despite the ornamentation and strange appearance, Turkish bow design was the most advanced of its day. Most manufacturing secrets are unknown.

The horn used in making Turkish bows was cut from the horn of a buffalo or an antelope and was usually about a quarter of an inch thick. The sinew, which was applied to the back of the bow, was taken from the great neck tendon of an ox or stag. It was shredded lengthwise and after being soaked in elastic glue was compressed into a long flat strip and carefully glued to the wood frame. It was always put on under great tension so as to cause the bow to take a most pronounced reverse curve. Unfortunately, the formula for preparing the glue used in the construction of these bows has been lost for many years. Similarly, although we know the composition of the bows, we do not know just how they were put together and we are unable to duplicate them even though we use approximately the same materials.

The bow was carried by the archer in a half case, often of richly decorated leather, suspended from the waist.

The string used on the Turkish bow was made up of sixty or so strands of tough silk thread, knotted at each end and tied securely to a loop of twisted sinew. This arrangement was necessary, since a loop of silk threads would soon have frayed and pulled apart. For approximately one and a half inches on each side of the center, the bowstring was bound with fine silk thread. Lashings of this thread held the strands of the string together at several points between the center and the ends.

War arrows measured slightly over two feet in length, as a general rule, with the balance about twelve inches forward of the inner end of the nock. The shaft was thickest at the balance, tapering to the ends.

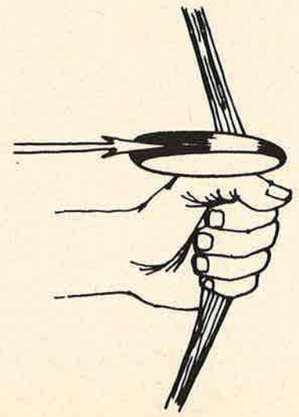
Most arrows had a nock so shaped that the sides had to be parted to admit the bowstring, after which they closed about it. This held the arrow in place, a rather valuable consideration, particularly for mounted archers.

Arrows were fitted with either feathers or thin parchment, the former almost always used for military purposes. In some instances the feathers were arranged in a spiral fashion in order to cause the arrow to rotate along its axis and so keep it truer in its trajectory.

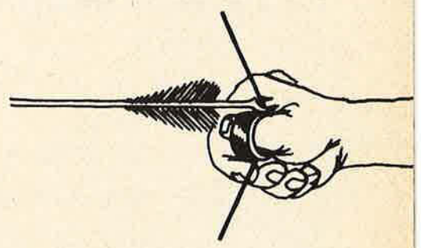
Some arrows were fitted with heads with movable barbs. In flight, these folded back against the head but swung out at right angles when an attempt was made to withdraw the arrow from the flesh. This type of head also was employed extensively by ancient Japanese archers.

Since Turkish bows were very short, great strength and skill were required to bend them. This was particularly true of the heavier bows used by the foot archers which sometimes required a pull of nearly 160 pounds. In bending these bows in olden times, the archer spread his feet slightly apart with one end of the bow, the bowstring already attached, against his leg, just below the knee. The belly of the bow pressed against the back of the other leg just above the rear of the knee. The free end of the bow was then pulled forward with one hand and the free loop of the bowstring placed in the nock with the other hand. The bow had to be kept from twisting during this maneuver, else it would splinter. This all required not only a strong wrist but strong arm muscles as well. Few if any modern archers are equal to the task of bending an ancient Turkish bow and must use mechanical assistance to accomplish the job.

For shooting at extreme ranges Turkish archers at times used an arrow several inches shorter than usual but bent the bow to the same extent as for a longer arrow. In order to keep the arrow properly guided in such cases, since the head was well back of the inside of the bow, a grooved horn guide was employed. Roughly six inches long, it was attached to a ring which was worn on the thumb of the hand holding the bow. This allowed the bowstring to be pulled back to its limit.



The Turkish bow was held in the center and Turkish archers used the "Mongolian Release" in which the arrow is placed to the right of the bow and the thumb passes around the bowstring and under the forefinger. A thumb ring is

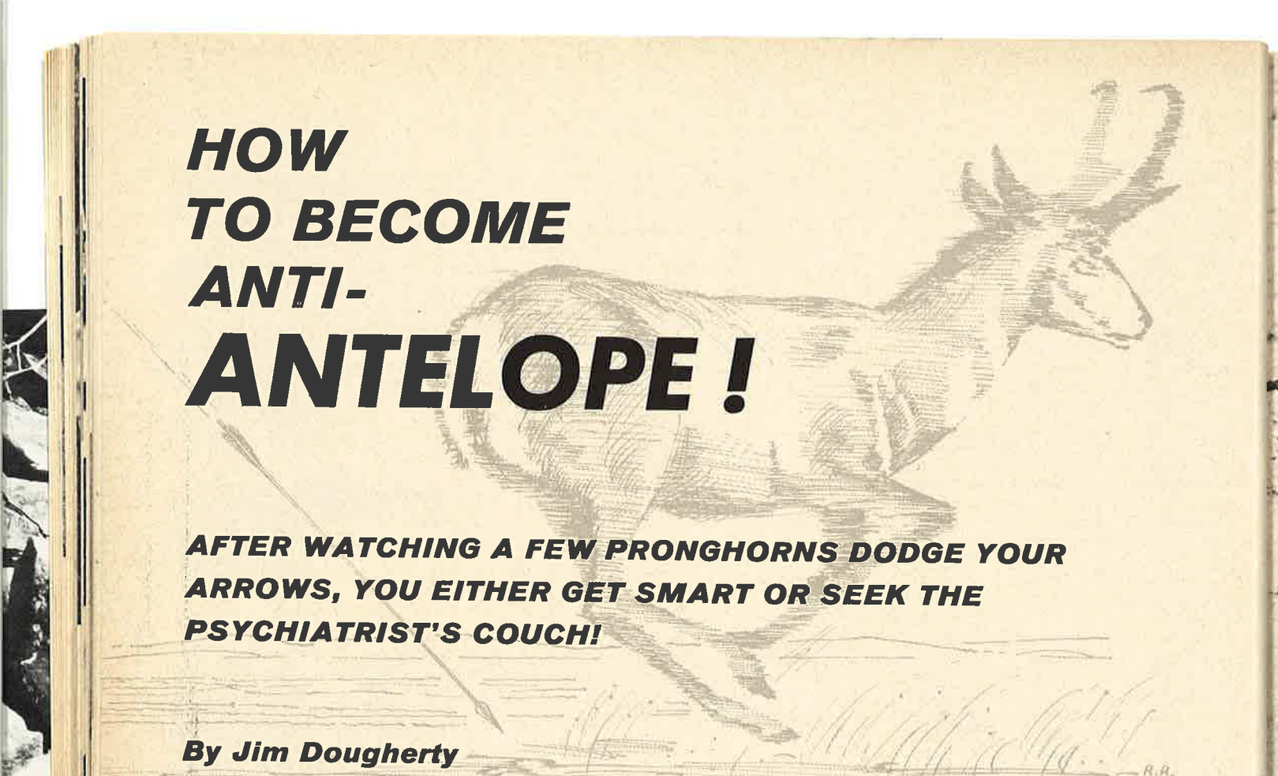


worn to protect the thumb from the pressure and from the chafing friction of the bowstring. Use of the thumb ring and this manner of release allowed the pressure of the bowstring to be concentrated at one point close to the nock of the arrow, making the arrow release, speed and trajectory much better than would be possible when three or four fingers were used to draw the bowstring. It also allowed the feathers to be placed much closer to the nock without the danger of being crushed. This in itself permitted longer and steadier flight. The part of the thumb ring which bore on the bowstring was always wider than the rest. The rings were usually made of ivory, jade, horn or bone.

The range of the Turkish bow was tremendous indeed, distances of 600 to 800 yards having been regularly accomplished. Mohammedan archers considered themselves rank amateurs if they could not exceed 600 yards. Consider for a moment the fact that the famed English long bow had a range of some 250 yards and the military crossbow of medieval times had a range around 380 yards and you will have some idea of the power of the Turkish weapon.

Mohammedan military leaders were great believers in mobility and fire power and they used their archers, particularly their horse archers, with deadly effect. Well mounted on small but rugged horses and clad in light flexible mail they were more than a match for the heavily armored knights and men-at-arms from Europe. Either afoot or mounted, the well trained Sons of the Prophet usually gave an outstanding account of themselves. ●

HOW TO BECOME ANTI- ANTELOPE !



AFTER WATCHING A FEW PRONGHORNS DODGE YOUR ARROWS, YOU EITHER GET SMART OR SEEK THE PSYCHIATRIST'S COUCH!

By Jim Dougherty

RAY Rich, publisher of BOW & ARROW, leaned back into the grass on the hill and queried "what's the best way to bag an antelope?" Assuming my best expression of believable intelligence, I recalled the vast prairies of Wyoming with their huge population of the animal in question. Those were days of fast and frustrating action; of arrows falling short, or more often, behind the fleet footed targets; of crawling for miles across open pastures like a snake hunting mice.

Hunting the pronghorn with bow and arrow is an experience that every archer interested in matching wits on an equal level with his quarry should try.

To begin with, the antelope is not really an antelope; he is a goat. Antelope have been accurately clocked at speeds up to seventy miles per hour, and they have the largest set of eyes of any North American game animal. This means that they see well too. They make a variety of sounds by blowing through their nose, from a bark to what I would describe as a whistle; this means that they can — and do — laugh at you when you miss. They send heliographic messages to each other across the open prairie by extending the long white guard hairs on the rump patch causing them to flash rapidly in the sun. While warning each other with these visual messages, they also emit a powerful scent, which when carried downwind, serves as a danger signal to others of the breed up to a mile away.

But they don't hide from you; they stay right out in the open all day long and tantalize you into thinking there might be a way.

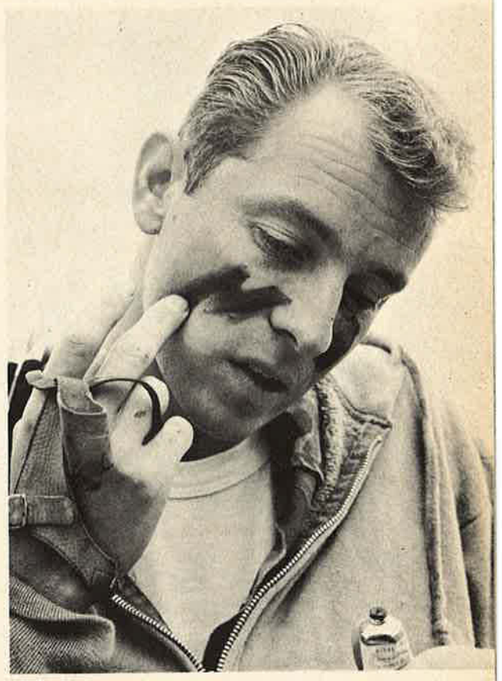
A man does not have to buy a .243 rifle to kill an antelope; however, it would certainly be the easiest way. Those of us who hunt with the bow have obviously decided that the easy way was not for us. To make a kill is not the all important thing. The kill should be the climax to a contest between you and the game; a hard fought contest of nerves, skill and intelligence; of knowing the game — and of having a super grade rabbit's foot in your pocket.

Most antelope hunts in Wyoming, which is the capital of all antelope hunting, fall in September. At this time, the rut is getting started or reaching a full pitch, depending a bit on the weather and the latitude. Romantic pronghorns will offer a bowman certain advantages in hunting. Bucks often are busy warring among themselves. This often gives the bowman a chance to slip up unnoticed for a shot. The herd buck is a pugnacious critter, ready to do battle with any upstart who challenges his privacy and supremacy or casts a coveted look at one of his does.

Here lies an angle to pronghorn hunting that will definitely require more investigation. While in quest of the prongies last season, my hunting partner, George Wright, hit upon a diabolical plot to do in one old fellow who had half of the available ladies under lock and horn.

Returning to the ranch house, Wright set to work with great vigor, bent on becoming a buck antelope. First, he cut a pair of record class pronghorn horns from cardboard and secured them to his hat. A fast application of shoe polish made them quite presentable. A perfectionist, he also darkened the center of his face to give himself the appearance of a truly magnificent and romantic buck. His fervor was infectious,

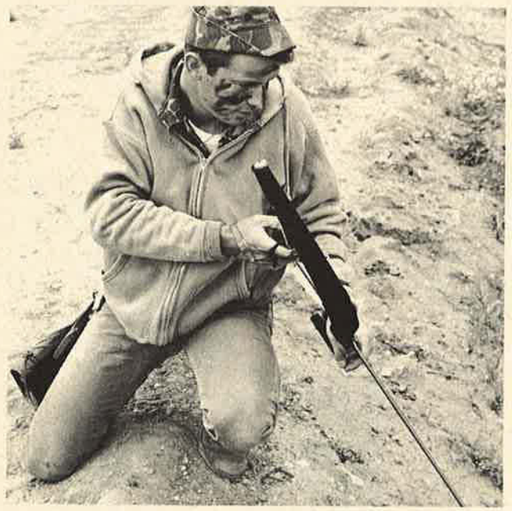
Author (left) is completely outfitted for an expedition during Wyoming antelope hunt; the yawn results from trying to get up early enough to out-think a pronghorn. (Below): He uses camouflage paint on face to make himself less visible in the blind during long wait.



and the rest of us dashed around the house searching for items to transform him completely. A throw rug was discovered of perfect color and shape; Cinnamon brown and oval. This was attached to Wright's back and fixed to his trophy type headgear. A freshly laundered tee shirt was attached to his rear so that it hung off his rounded posterior, simulating a sparkling rump patch.

Wearing a white tee shirt over his torso and white levis tinged with more shoe polish, George

What the well-dressed bowman will wear when stalking: Bow is Howard Gamemaster 52-pounder. Arrows are Easton 2016 aluminum, built by Kittredge Archery with Little Shaver broadheads. Note that bow is covered with stretch material from old leotards to cut down glare. Cap is by Abercrombie & Fitch. Hunter holds quiver close to body to avoid shake, rattle and roll.

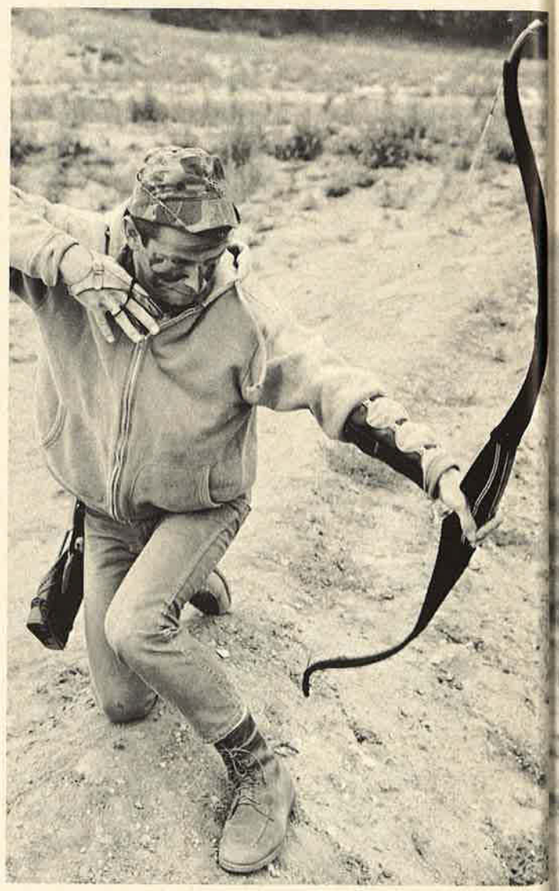


Steps — which may work — in outwitting a pronghorn are illustrated by author in these photos. He sights his game, then slowly gets into position, making as little movement as possible. In shot at lower right, he has just released his arrow at game for what he hopes—desperately by now—is a scoring hit.

Farley and I had been sitting only a few moments, eyes glued to our field glases, when "Pronghorn" Wright hove into view over the hill. He bent over, turned broadside, bounced twice and snorted a challenge to the buck in the valley below. The buck, at least three hundred yards away, couldn't believe it. He spun around and pawed the ground, cast a suspicious glance at the girls, who were looking at George, snortin' with open admiration. Then the buck lowered his head and charged.

At this point, George informed us later, he was experiencing some mild regrets. The buck came at a dead run across the valley and up the hill but at fifty yards, he seemed to experience some misgivings. He skidded to a halt, pawed the ground, then lowered his head again for the final lunge. At this point, Leo gave a startled cry. Another buck was making off with the big boy's does.

For the next five minutes, the pasture's green carpet was covered with dust as the big buck charged back and forth, trying to save his herd from these



two challengers. It was a wild melee of grunts, false charges, actual contacts and a few scattered arrows. But, the plan had worked and a new concept of bow-hunting pronghorns was born.

The main disadvantage in shooting an antelope with an arrow is the reactions of the targets. Possessing magnificent vision, they can see the arrows coming at them. Possessing better coordination, they can side-step, duck or outrun the arrow as it pursues them. This is a pure and simple fact: Antelope are tough targets.

The pronghorn is not a large animal, but his bright coloration against the drab background makes him appear larger — and therefore closer — than he actually is. The archer will find that most of his misses will be on the short side, often by as much as twenty yards. In the open country that these critters love so dearly, range estimation is a real problem. This is ever a problem for the man who attempts to flatten one with his favorite smokepole.

Antelope can be stalked successfully, though. It requires a vast amount of patience and the utmost in determination. The Wyoming country has many little draws along which one can crawl; slight ridges that one can use for what little cover it will offer. Using these means, it is not too difficult to close to within sixty-five yards. Most often you will be shooting from a low position — kneeling or even lower, if possible — the prongies generally will let you get off the shot, being somewhat inquisitive. They are not so inquisitive as to wait to see if you scored a hit. Sometime between the release and contact, they decide to move. Radio-controlled arrows would be a real boon here.

In stalking, camouflage is a big help. The coloring of the clothing should blend well with the countryside. Remember those eyes; they probably saw you get out of bed in the morning. I recall one incident when I crawled across a low ridge bent on sticking the buck in a small band with a 2016. All the eyes of the band were elsewhere as I made ready to shoot.

The buck was about sixty-five yards away, and by this stage of the game I was shooting more and en-

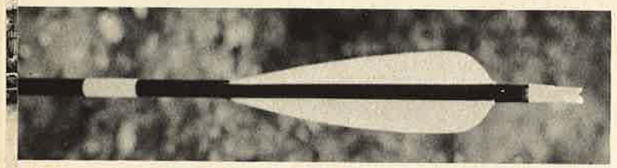
The late departed was slain at seventy yards, give or take a foot. The arrow pierced upper chest, went through the lungs to cause internal bleeding and animal's death.

Wright became the first buck antelope — pseudo or otherwise — to cavort about the living room of Maycocks' ranch while sipping a beer. At two thousand yards he would have fooled me completely. Assuming a bent position, arms dangling to the ground, George perfected his barks and snorts, while bouncing up and down in the best antelope tradition. Crude as it was, I was convinced that he might have something.

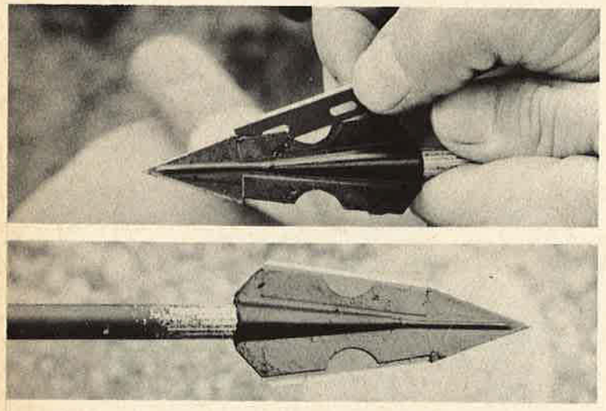
We put the plan into gear.

Wright, Leo Farley and I drove past the pasture where dwelt the monarch of the ranch. His does were at rest, while he stood off some distance riding herd on any desire they might possess to try and investigate some distant youngster who lacked courage to come calling.

Out of sight over the crest of a low swell, George disembarked while we turned and raced to a distant hill to observe what might well be the end of a dear friend. It very nearly was.



In hunting, the author uses aluminum arrows, but because of the expense, he paints them red with white five-inch feathers to make the misses easier to find in the brush.



Dougherty uses Little Shaver broadhead arrows for most of his hunting treks. Injector type razor blades can be easily inserted and removed, assuring one of sharp edges.

joying it less. In keeping with most of my past performances, I missed him cold, shooting high for a change. This, in itself, was some sort of mental victory. The buck turned his gaze up slope and fixed his huge brown eyes on me. I shot four more arrows and I firmly believe they were good ones, but with each shot his muscles tensed, he dropped his head a bit, and leaped out of the way. I did manage finally to skewer a fine buck while stalking him. However, I have to admit, I cheated. I shot him in the back!

There really is only one excellent way to bowhunt antelope. This is from a blind at a waterhole. I have run into those pure-type people who scream indignantly at the suggestion of such an uncouth ambush, but let them scream. Crawling on your belly is a great way to study the local flora and insect life, to meet up with certain unsavory reptiles and to develop excellent calluses; it is not the best way to fill a $25 antelope tag.

Antelope drink several times during the course of the day, although the weather will have a bit to do with this. The hotter it is, the more they will drink. During a dry year, this can offer the choicest of situations. Blinds should be constructed in such a manner as to blend well with the low sage. This is done by digging a hole which allows the hunter to sit well below eye level, the blind also should be quite roomy as you are going to be there quite awhile; allow ample room to straighten your legs and shift positions. Build the blind up with sage or whatever is natural growth all around, making it somewhat higher in the back, but not so high as to draw attention. Several openings should be left through which to shoot, if the blind will allow you to shoot without standing up. Most of the waterholes in the prairie country are behind dirt dams at the lower end of a natural draw.

The best blinds I have seen for shooting with a minimum of movement are those built right into the side of the draw, sort of a cave affair. Antelope are very cautious when coming to drink, and take a lot of time to study the situation. When they make up their minds, however, they all gang up and come in at once. This is not the time to shoot. Generally the buck will drink alone, most often in advance of the does, but I have seen many cases when the entire herd drank simultaneously. This stage of the game is why you have been sitting there all day, yet, it is without a doubt the most nerve-wracking of emotional experiences and it is here that most setups become goof-ups.

Never shoot at the game the first time his head goes down; it goes down and comes up immediately. An Indian told me once, "The first time they kiss the water; the second they taste it; the third, they drink." When an antelope finally goes down, he plunges his head into the water up to his eyes and sucks it up like a hose, and this is the time to take your shot. Veteran antelope busters have told me that if you have to raise for a shot, do it now. Not too slowly, not too fast . . . they might see you but they won't bolt all at once. Their theory is, they didn't see you when they came in, and they can't really believe it. Here again is a classic example of how much they depend upon their eyesight.

Sitting in a blind can offer a variety of excitement, too. I spent one long, long day in a fine blind and spent several hours with a flock of mallards that zoomed in at sun up and spent the day with me. For better than an hour they were within scant feet, and it was a great occasion to listen to their conversational chatter and store it away for later use during the duck season. I am not the sort who can sit too long in one place, but a blind at a waterhole, I can tolerate, because something is always going on.

One of the finest aspects of hunting pronghorns is that you can always see game. In almost every direction you can see one or more of the beautiful animals feeding, bedded down or playing. At least you know they are around, which is not so often the case when deer hunting or in pursuit of other specimens for the den wall.

The archer who goes after a pronghorn will have an unparalleled ball. He will get lots of shooting if he is not too particular as to what he is after in the way of a head. The real trophy bucks come harder. Long shots for the stalker will be the rule, and you will do well to brush up on this phase of skill. But not at the local field range, as this will not help you a bit. Get out in the open — the wide open — and shoot . . . and shoot.

Several states have a fine antelope program, but Wyoming has the best set up. For $50 the non-resident can take one antelope and two deer. Deer hunting is fabulous for bucks grow huge and the does will average 140 pounds field dressed. It is not uncommon to see deer on the plains with the antelope, although they generally seek out the bigger draws and coulees adjacent to the antelope range. Nothing will startle you more than to bust out a big-four point from a ditch hardly able to conceal a jackrabbit. The majority of the land is privately owned, but the ranchers are more than willing to allow you in to hunt, although a slight use fee usually is charged.

Cheap enough for the thrills that await you. ●

BOW BITS

8-IN-1 CAMPING TOOL

Here's an item due to hit the market that weighs only 2½ pounds and is just about anything you want it to be. It contains eight essential parts to serve as hatchet, spade, hammer, saw, chisel, nail puller, bottle opener and screw driver. The four-inch hatchet is sharp and heavy enough to down small trees, while the nail puller and cap opener are notched into the flat side of the blade. The rest of the parts are contained in the hollow handle, excepting the spade blade. The whole thing will sell for $7.50.

STUART STABILIZER

This unique stabilizer attaches to the back of the bow and requires no hole drilling. It can be applied with any type of tape. They're made of a cast alloy and once installed are meant to improve your accuracy through a better line, improve your bow hand, overcome torque, and it's good on either right or left-handed bows. Weight for men's bows is 20 ounces against 16 ounces for the lady's model. It's available in gold finish at $4.95, or with baked enamel finish for a dollar less. In the latter finish, there's even a range of available colors: Black, green, red and white.

For further information, write to Al's Goldfish Lure Company, 516 Main Street, Indian Orchard, Massachussets.

OUTDOORSMAN'S HEATER

Gloy's Import Company is introducing the Vulcano camping stove, which weighs only 2¼ pounds and measures 9 x 6 x 3 inches, fitting into a pack or glove compartment. It operates on ordinary alcohol and operates without pressure. A knob control allows one to vary heat from a low simmer to a high intense flame. Information is available by writing to the company at 11 Addison Street, Larchmont, New York.

TULE TROOPER

Here's a rough terrain vehicle that'll allow you more strength to pull that bow out in the back country.

The Tule *Trooper* can pack a 400-pound load and climb a full grade. It's powered by a four horsepower engine, has an automatic clutch and variable speed transmission.

The whole kit only weighs 125 pounds. It is 66 inches in length and with a full eight inches of ground clearance, can attack pretty rugged terrain.

For the hunter and camper, it has a cargo box that measures 1600 cubic inches for gear. It sells for $279.95 fully assembled, or you can save $50 if you want to put it together yourself. A brochure's available from J. I. Edwins Company, Issaquah, Washington.

GAME TARGETS

Wayside Printers of Pottstown, Pennsylvania, have come forth with an interesting line of colored animal targets for archers. In all, there are twenty-eight of them, life-like and giving various pictures at which the archer can shoot, varying the targets with his degree of skill, as some are difficult, while others present easy shooting.

Sizes range from 13x13 inches up to 26x39, making it possible also to shoot at a number of distances. Types of targets range from quail and rabbit in the smaller sizes up to bear in several stances and cougar in the larger sizes.

The organization prefers to sell only in the East and to clubs, since increased postage is required for Far West orders. But if interested, you might inquire as to costs including postage. Prices are from fifteen cents to a dollar a target for either one or two colors.

A catalog sheet is available by writing Wayside Printers, Pottstown, Pennsylvania.

Seventeen-year-old Marie Range was chosen MISS CALIFORNIA ARCHERY at the State meet in Sonora. New to archery, she has been shooting only since April. Professionally, she is a photographer's model.

The new Browning bow sight, made for installation on virtually any bow in addition to those models of the manufacturer, has two scales, one of which may be graduated by the shooter for the different ranges. The other will reset this scale for other types of arrows or for a new bow string. With it can be used a standard sighting post, or this may be removed and sight reticles and prisms of wire frame design substituted. This makes it adequate for indoor, outdoor or hunting type shoots.

GAME LURE

This is a unique blend of natural musks, carefully formulated to attract big game with its alluring (?) aroma, and carries up to one mile — if the wind's right.

A few drops of the scent near the hunter's stand or on a scent pad pinned to his clothing is supposed to insure his bagging his game.

And it's a lot handier than a sardine can, too. It comes in an unbreakable squeeze-type bottle and is available at most sporting goods stores for $1.50 per one-ounce bottle. It works on bear, moose, elk, deer, antelope, mountain sheep and goat, and cougar. It also is said to draw in fox, coyote, bobcat and javelina. With it, you also get a booklet by Bert Popowski, *Where and How to Hunt Big Game.* If your dealer doesn't stock this formula, write to North American Lure Company, West Brooklyn, Illinois.

DOUBLE-PURPOSE KNIFE

For the hunter who goes for compacts, be they cars, beer cartons or knives, there is a new blade that is combined with a monocular field glass.

The *Tele-Optic* knife and field glass has a five-inch highly polished Solingen steel blade and a non-slip safety handle. The field glass has a double lens which is embedded in the knife grip, although we received no info on the power of this glass. But there is a snap-on cowhide sheath.

It's available from Leon Zakian Company, 58 Engle Street, Englewood, New Jersey, for $3.95.

ARCHERS BOOTS

Field boots, designed especially for the bowhunter, are offered by Ebinger Brothers of Rowley, Mass. Known as Archer's six-inch Field Boots, they are made of Alcan hide and silicone treated leather with glove-tanned cowhide vamp lining and non-slip soles. They convert into eight-inch brush boots by merely turning up the cuff. Sizes available, 6-12, with widths ranging from C to E. The boots are priced at $19.95, postpaid.

THE ALLEY CATS CAN SWING TO ARCHERY

THIS may be a sign of the times, but the letter, "I," may soon be coming out of bowling alleys, resulting in their conversion to bowing alleys.

William Tell Archery of Anaheim, California, has patented a new unit which makes it possible to convert the existing alleys into archery lanes at minimum cost. In view of the fact that in some sections of the country, bowling houses have been overbuilt, this could easily prove a boon to those operators who are seeking means of diversifying their establishments.

Anthony T. Radaich, president of the firm building the new unit, has already installed one lane in an existing bowling alley in nearby Pomona, California. As a result of the growing interest in archery, people are standing in line to try their hands at target work, while bowling lanes under the same roof are going unused.

The William Tell mechanism differs from most others in that it has no wires or cables following the action. Nothing but the target is visible to the archer, since the mechanism is electronically controlled.

According to Radaich, at least eight bowling alleys in the Southern California area are considering switching their operations completely to indoor archery. Not only are the existing structures ideal for archery, but the scoring equipment, pro shop, league play facilities and other facets can quickly be switched to use by bowmen. No major alterations are required.

Joanne Radaich, newcomer to archery, tries her hand at the indoor version. The target, which has been stationed at whatever distance is desired with electronic controls, has been installed in a bowling house.

Build Your Own HUNTING KNIFE

By Tommy L. Bish

EVERY BOWHUNTER NEEDS A BLADE IF HE'S GOING TO SPEND TIME IN THE TIMBER; THIS ONE CAN BE BUILT TO YOUR OWN SPECIFICATIONS AT MINIMUM COST!

ONE of the most important items that an archer can take into the tall timber during the hunting season is a good sheath knife.

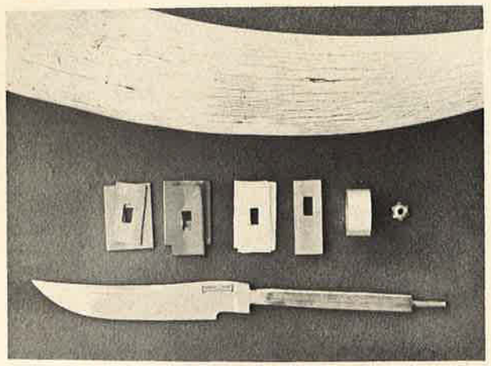
To illustrate this point, there was the bow hunter who hiked some seven miles or more over rugged terrain until he was in excellent hunting country. He stalked and brought down his deer with one shaft only to find that the animal weighed in excess of two hundred pounds, fifty pounds more than his own weight! This neophyte carried no form of cutlery nor did he have a small block and tackle with which to hoist his kill off the ground!

To make a long story short, this hunter hiked those seven rugged miles back to his base camp, got his hunting companions and returned to the site of the kill, planning on packing the deer back to camp. But upon arriving at the site of his early morning kill, his two hundred pounder was gone from the spot where it had fallen. A short search disclosed that the deer had been dragged into the surrounding brush and had been literally torn to bits by wolves. Had this hunter taken more precautions in his selection of hunting gear, he certainly wouldn't have lost all of his venison. He could have quartered the animal and taken the choicest sections with him on his return to camp. Better yet, had he carried a good knife, and used a little ingenunity, he could have hoisted that carcass high into a tree with the use of a couple of cut saplings.

To eliminate a repetition of this sort of incident, let's build our own knife. We'll take for granted that inasmuch as we are going to spend valuable time on this project we will want an ultra-fine knife to reflect the final result of our efforts.

For such a project, I selected what I consider the finest piece of steel available in blade form today. This blade, of the finest Swedish tool steel, is a part of a Make-It-Yourself Knife Kit produced by the world-famous Randall-Made Knife Company of Orlando, Florida. These kits are available in several styles of hunting knives and can be ordered in any stage of completion as far as the grinding operation is concerned. To determine your choice of designs, it might be wise to send ten cents to this firm for their Make-It-Yourself Knife Kit brochure.

As stated, this kit was selected for use in this article for the outstanding quality of the steel, but utility and beauty of the knife, when finished, will depend entirely upon just how much skill, time and patience you, yourself, care to put into it.

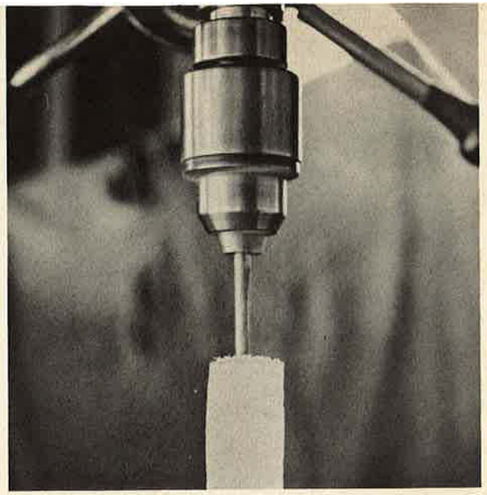


The kit, when received at the offices of BOW & ARROW Magazine, contained all materials necessary for a complete knife with one exception. I had told Randall that I intended to use my own elephant ivory for the handle, so it wasn't necessary for him to include the usual leather handle material furnished as a part of the standard kit.

The firm will furnish various semi-precious materials for handles, but this is an "extra" and is not included in the standard kit. Such materials as lignum vitae, rosewood, ebony, stag horn and a host of other materials may be utilized for knife handles in lieu of the leather discs normally furnished with the kits.

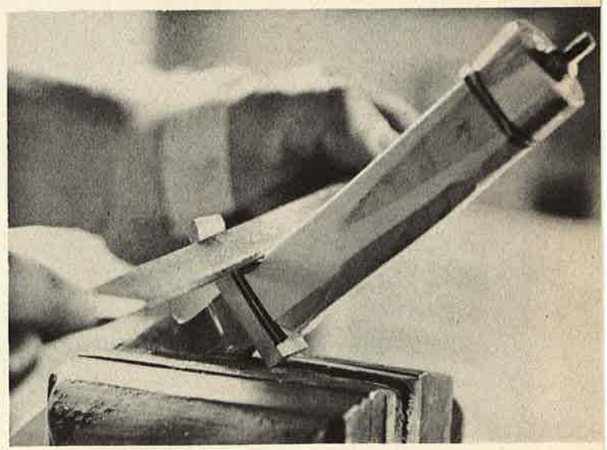
After the kit arrives, the first step is to rough preshape the brass guard, then slide in onto the blade tang until it seats perfectly upon the shoulders. The guard then is soldered into place making certain that all excess cracks around the tang hole are well filled with solder. With the guard permanently in place, our attention is turned to the handle material itself. Included in each kit are several pieces of fiber in red, white and black.

These fiber discs serve as handle spacers and decorators and may be placed according to individual taste. When worked down, finish-shaped and finally polished as a part of the handle, these fiber discs add greatly to the appearance of the finished knife.



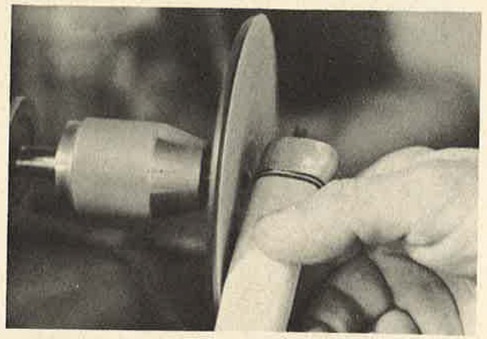
If a solid piece of material is to be used in place of the leather discs for the handle, it first must be drilled completely through lengthwise with two side-by-side quarter-inch holes. This will form a slot measuring approximately one-half-inch in length after minor dressing with a small rattail file. The steel tang of the handle section of the blade should slide snuggly into this slot in the handle material, allowing the material to seat upon the guard. Make certain at this point that the solid handle material seats evenly and squarely upon the guard.

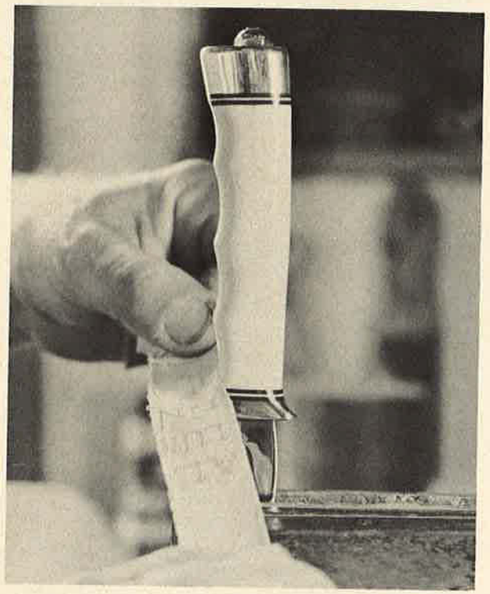
We will assume that the handle material has been drilled and the fiber discs placed to your satisfaction. Now, we will assemble and cement — or glue — these parts onto the steel tang, all in their rough form. The brass or aluminum butt cap then is put in place and the locking nut cinched down quite tightly. Allow a couple of hours for the glued handle sections to set.



From this point on, the entire handle section, consisting of brass guard, fiber discs, handle material and butt cap, will be treated and dressed down as a single unit with the use of a variety of files and, if available, a disc sander. The skill exercised in the shaping of the handle will determine the quality of the finished knife, so take your time.

One of the thrills in building-it-yourself is the fact that when your knife is completed, it will be one-of-a-kind with the complete handle section built by you to your own design requirements.



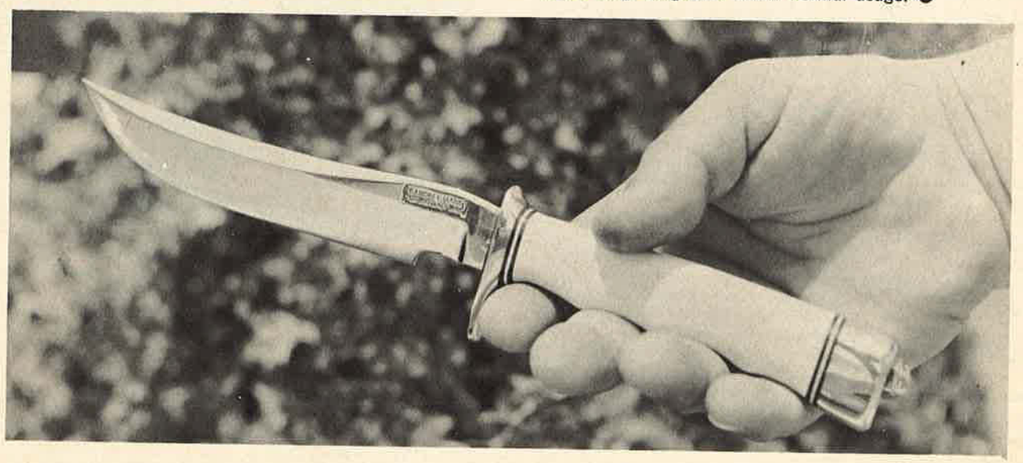


The handle section first is worked down to desired shape by careful filing and disc sanding away all excess bulk. It is well to shape the handle to your own hand size, and finger slots may be cut into the surface with a half-round file or a one-inch drum sander, then later smoothed up with garnet sandpaper.

After the rough shaping with first a medium coarse file then smoothing it out with a finer file, the entire handle section is thoroughly finished with, first, medium grit, then fine grit garnet paper. This is followed by extensive buffing on a muslin wheel treated with white buffing compound. This should remove all minute scratches and file marks from the handle material as well as from the brass guard and butt cap, turning the latter into sparkling pieces of metal. The handle material, whether of elephant ivory, stag horn or other material soon will develop a beautiful luster and shine under the buffing wheel.

This one operation turns your knife from a dull looking piece of equipment into one of real beauty, so take your time again. After the entire handle section is buffed to a shiny finish, give that blade a good buffing, too, followed by a brisk rubbing down with a clean, soft cloth.

Like your choicest broadhead-equipped arrows and your favorite bow, this knife — with but little care — will take good care of you while on that hunting trip this season — and one good honing of that blade will last a long, long time under normal usage. ●



MAIL POUCH

(Continued from page 7)

promised not to release any more arrows in my direction if you will forward me two copies of the May-June issue, Vol. I, No. 1. I enclose one dollar.

Edward W. Thomas,
Oswego, New York

(Well, that's one way of getting rid of back issues, and our binder would probably pay a fortune to know what the concoction was that glued together the pages!)

FROM A PRO

Once again, let me congratulate you on a very fine magazine. I have been wanting to write for sometime; in fact, since I first read the beginning issue. Your selection of Cathy Duncan (for the cover photo) was ideal what a darling girl she is. Good luck and continued success.

Ann Clark,
Professsional Archers Assn.,
Cincinnati, Ohio

(Not only is Cathy lovely, but she also is an excellent archer, as evidenced by some of her trophies!)

AIR FORCE PLAUDIT

Congratulations on your new magazine. The No. 2 issue is even better than the first one! A newsstand magazine to present the archery story has been needed for some time, and BOW & ARROW is stepping up to the need in fine shape.

Rodney A. Jones,
Colonel, USAF,
Redlands, California

AND FROM THE BUSINESS

We like your magazine very much and would like to wish you continued success in printing a fine publication.

Donald C. Riemann,
Rohde Fletchers,
Milwaukee, Wisconsin

I have just finished reading the first issue of BOW & ARROW and it's GREAT. Enclosed is my check and coupon for entering my charter subscription.

L. A. Grant,
St. Paul, Minnesota

(Mr. Grant is the maker of the Grant 4-Arrow Repeater, and he'll be happy to know he got in just under the wire on the charter subscriber offer. With this issue, B&A goes to $3 per year.)

We are very pleased with the cover picture of your July-August magazine. Thank you for the most beautiful cover that ever was put on an archery magazine.

Don Merrill,
Merrill Bow Sights,
Minneapolis, Minnesota

ARCHERY BEGINNING

Here in New Brunswick, archery is only beginning. There are a few clubs, one affiliated with the Canadian Archery Association. But, around the world and especially on the North American continent, it is growing rapidly as seen by the addition of BOW & ARROW on the literature market. I commend you on a fine magazine.

Brian L. Perry,
Havelock, N.B.,

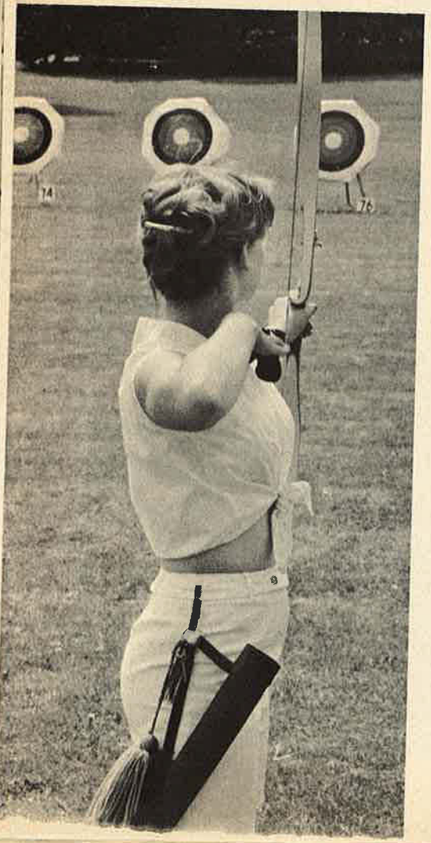
ART COLLECTOR

I want to become a charter subscriber of BOW & ARROW, but not by clipping a coupon which would cut into a good reproduction of an archery print, let alone mutilate a magazine which could very well become a collector's item.

Anyway, here's my two bucks — and more power and distance to a shot well released.

Neil J. Breen,
Spokane, Washington

Big Bow Bash at Bloomfield



This proud banner, resembling a remnant of the archery contests of the Round Table era in England, boasts the colors and crest of tournament's sponsoring organization.

By Tommy Weber

IF you think that there is no such thing as a bow-bent town, take a look some Sunday at Bloomfield, New Jersey. This community cannot be considered a hamlet by any means with its 50,000 or so residents and the town makes no claim that every citizen is an archery enthusiast.

But when the Bloomfield Archers decide to hold a tournament, participants come from all over the East, and this year, there was even one from as far away as Arizona!

The New Jersey organization usually holds its major annual tournament in the first week in June, and this year was no exception. From 9 a.m. until nearly 7 in the evening, archers of every size and bow pull shot shafts over the prescribed courses in fourteen different events that were designed to afford competition and a chance at medals and awards for all.

For the 1963 tournament, an after-sundown tote on statistics showed that there were 330 partici-

Comfort in attire may not add to one's score in the final total, but this young miss scored high in total interest and appreciative looks by males.

At the Bloomfield bash, equipment ranged from home-made to the top that money can buy, and the variation in the accepted costumes for archery was even more broad. The protective harness across chest and back is to keep bowstring from catching on clothing, blowing shot.

Left: Nothing can keep down an avid bowman. This is proved by Richard Robinson, New York State Indoor Champion, who has been shooting for two years. He attends the Bulova Training School for the Handicapped.

Below: The crossbow was designed originally as a weapon of war, but this has not kept the little ladies from making an avid showing when it comes to competitive scores.

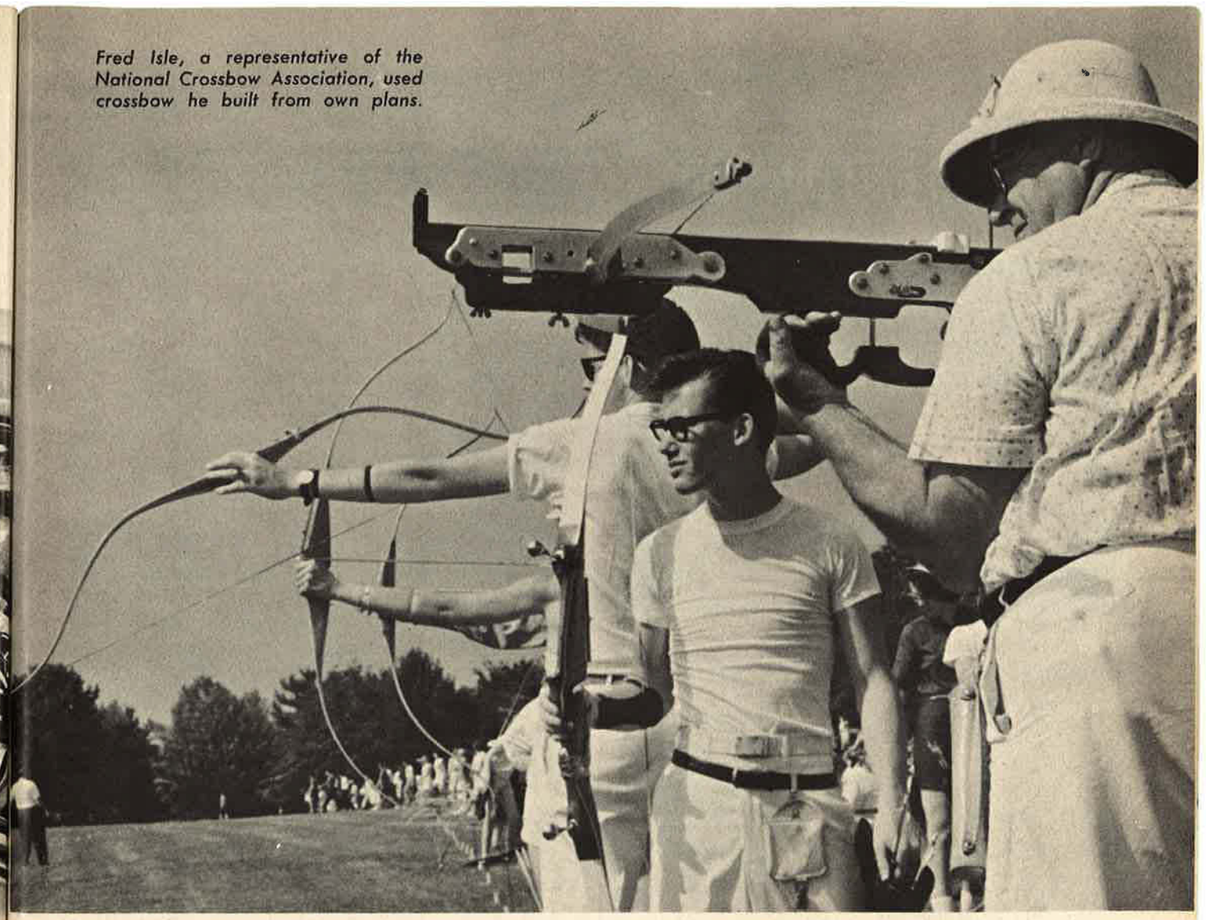
pants — not counting scorekeepers, judges and volunteer workers. Also, since the New Jersey high school championships were being shot, there were teams from thirty-four high schools, encompassing the talents of 136 teenage competitions. Popularity of this particular facet is reflected in the fact that this is only the third year in which the high school bow-offs have been held. The first year, there were only eighteen schools taking part.

And if you want the scoop on how to carry on a tournament of professional status, the Bloomfield affair is a good one to check on. For example, there is rarely any doubt as to what is the score. Throughout the entire day, loudspeakers constantly advised onlookers of the standings, and there was a scoreboard on which the winners were posted as each event was completed.

With the tournament gaining momentum in recent years, Bloomfield citizens feel certain that next year's participants should go over the half-a-thousand mark.●

Clerical work and scorekeeping is a vital part of every archery contest. Portable office is used in tabulations. Below: Mrs. Ollie Crouch of Phoenix, Arizona, coaches Eileen Jauch of the Woodbridge (N.J.) high school team.

Fred Isle, a representative of the National Crossbow Association, used crossbow he built from own plans.



Left: Toni Russell of the Bronx Archers illustrates excellent form as she concentrates on garnering a trophy.

Oldest and youngest archers at outing are greeted by Clayton Sheck of NAA. Oldest was Wm. H. Reid, 70, of Philadelphia; youngest was Wendy Rice, 8, from Linden, New Jersey.

HUNTING WITH KITTREDGE

(Continued from page 9)

mean leaving camp a half hour before daylight, using a flashlight to see with. Move quietly into the area and then wait for the hunting hour to approach. Take along a candy bar or sandwich to stave off hunger later on in the morning. Hunt until you find the deer have stopped moving around. This will usually be 9 to 10:30, depending on weather, moon phase, and how much the deer have been hunted.

When deer stop moving, odds are against the hunter obtaining a good shot. As a certain amount of time has to be spent daily in camp, this is the best time of day to spend it. Go back to camp, eat a good meal, take a short nap if needed . . . and practice shooting.

Here can be the most important activity of your bowhunting trip! The average archer-hunter spends a good part of the year developing his shooting to a fine edge. Just before hunting season he practices continually. Then, what with getting everything ready for the trip, setting up camp, etc., the bowhunter hardly shoots an arrow until his first shot at game. Without a warm-up, he is rusty and with the excitment of the chance to fill the bag, often as not the shot is a miss. You'll find that time spent practicing during the hunting trip will keep your shooting form honed to a fine point during the entire season. Take along one of the small sixteen inch target matts and set it up for a 30 or 40-yard range in camp. Plan on regular practice a half hour or so each day before the afternoon hunt. If some of the guys want to go out for a bit of "stump" shooting, by all means join them, but don't forego the regular target practice as this will do far more to keep your shooting form in trim.

Most archers start the afternoon hunt too early — and end it too early. Deer do not start moving well until just before dark. Get into the area you want to stalk late in the afternoon when the sun starts casting long shadows. Keep hunting until the last minute of legal shooting time. The later you hunt in the evening, the more deer you will see. Just for fun, some evening pick a feeding ground you can watch from a distance and stay there until it is too dark to see with your binoculars . . . you'll be surprised at how many deer seem to pop out of the brush just as the first stars begin to faintly show.

Take a flashlight with you on all evening hunts. If you are at all far from camp when you stop hunting, you'll need it to come in with, and if you get a deer down, you'll need it to track him.

The actual technique of stalking consists of carefully moving as quietly and slowly as possible through the hunting area. Keep concealed as much as possible, without exposing your outline to the open sky. Wear clothing that blends well with the surroundings. Camouflage can be of great help, providing it is soft enough not to make noise when a branch scratches it; washing a new camo suit several times before hunting is a great help. A camouflage "bow-sock" over your bow will conceal the glint of light reflecting on the finish. Stay on deer trails, rather than cutting across country. You'll make less noise and deer expect movement on a trail, but not off of one.

Moving slowly cannot be over-emphasized. Deer may be color blind and they may not be able to determine individual stationary shapes, but they have fantastic vision when it comes to detecting movement. The mere flick of your head when you turn at a sound, or the quick raising of a leg can be seen by deer a good quarter mile away. It works well to move only 10 to 30 paces and then stop along side a bush or tree while you look carefully around a few moments before moving farther. By so doing, you may see a deer move into view that was concealed but a moment ago and which you would have spooked away had you continued a steady movement.

Be careful when approaching open areas, meadows and the tops of ridges. One of the most successful ways to stalk is along a ridge, keeping back from the edge when you move and sneaking carefully up to the edge every so often. This method keeps your movement, human scent, and noise concealed, allowing you to approach above the deer where he least expects it.

Soft-soled shoes are a must for quiet movement. Use foam rubber or crepe on boots or hunt in tennis shoes. I've known some bowhunters who slip out of their shoes and travel in stocking feet whenever they have to approach a deer to close range. Take care that your equipment does not rattle or squeak when you move. Remove all coins and keys from your pocket.

Human scent can be a great problem to the hunter. Hunting into the wind will help keep the scent from the game. A six-foot piece of fine thread fastened to the tip of your bow will act as a wind indicator. The smell of cigarette smoke is particularly offensive to game. If you don't smoke, you have quite an advantage, but take care not to wear your hunting clothing in a tent or car with smokers, as it will take on the odor in a short while. Campfire smoke is another bad one, as is the smell of automobiles. A good precaution is to have a set of "camp" clothes to slip into after hunting. Take several changes of clothing and change every few days. Take a sponge bath regularly. Don't overlook washing your hair and the use of a deoderant.

Pine or sage oil, used in moderation on the hunting clothes, can be a big help in masking human odor. Or try rubbing handfuls of pine or sage needles into your hunting clothes.

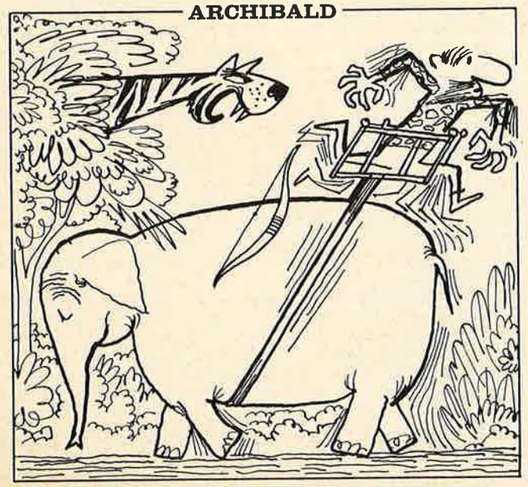
Hunting from a blind or a stand can be one of the most effective methods of bowhunting when done right. It eliminates the chance of your movement being seen and it gives you a chance to shoot at game under ideal conditions . . . when the game is unaware of your presence, is at close range, and not moving. The trick is in selecting the location for your blind and in having the patience to remain in it during the hunting hour.

Scouting the area where you want a blind is a must! If you can determine how the deer move, where they move, and when they move, you can pretty well work out a pattern to establish a blind in the best location. It is necessary that deer in the area be in reasonable concentration and that they are habitually doing the same things each day. Blinds located on a small saddle, separating one area from another, is often a good bet. The saddle should be such that there is only a narrow place for deer to cross, so they have to follow the same route each time.

Unusually lush, green feeding grounds are another ideal place for a blind. This is particularly true on a hillside where the feeding ground forms a sort of bowl and the hunter can stake out above the deer, waiting for the one he wants to feed within range.

In heavily hunted areas, where deer have been spooked up a bit, the observing hunter can find little pockets of deer deep down in tight canyons, or high up in a pocket on the side of a hill. Regular use of binoculars when in the field will often find deer locations others have missed. Whatever areas appear good for regular deer habits, should be watched with binoculars to determine how the deer act, where they move from and to, and what time they normally start moving. Whenever you are hunting, scan the opposite hill sides and canyons to see what game is there . . . even if you don't intend hunting there that day, you might find the area alive with game for hunting later on, or for establishing a blind.

The blind should be built during the middle of the day when game is bedded down and will not easily be alarmed into flight. Clear enough ground that you can move around in the blind without making noise. Get into shooting position in all directions where you might expect to take a



HUNTING WITH KITTREDGE

(Continued from page 61)

shot. Clear out such branches as needed. Actually shoot a few arrows where you expect the deer to be so you'll know the range when the time comes. The blind should be located twenty-five or more yards from where the deer will come. Closer shots are nice, but chances are the deer will hear you draw your bow.

A drop or two of deer lure, or skunk oil along side of the deer trail where you would like the deer to stop and lower his head while you shoot, will many times give you a shot like shooting fish in a barrel.

Get into your blind at least a half hour before you expect the deer in the area to start moving. This will usually be well before daylight, or early in the afternoon. Be quiet sneaking into your blind area. Take enough warm clothing so you don't get fidgety. Do not smoke, or go to the "john" any where near your blind. If your blind is located in a tree, be sure you can shoot from it without falling out. Lie down and be comfortable until deer begin approaching. Carefully get into shooting position while the deer's attention is elsewhere than looking in your direction. Shoot when you can't stand the suspense any longer.

Grit your teeth and don't leave a well located blind until you are sure deer have quit moving, or it is past legal shooting hour.

Organized drives are somewhat like locating a blind, in as much as the deer habits in the area should be known. If you know which way the deer run out of a thicket, or out of a canyon, you can station the shooters in the right spot for the best shooting. Drives normally result in running shots at close range. They are very exciting, and can be productive for the archer skilled in moving shots. The drivers should work the area slowly with not too much space between archers. Quite often the drivers can get good shooting at game which is stationary, or moving slowly ahead of the drive line.

It is important that the stationed shooters remain on their stand location until the drive line reaches them. If there are enough archers participating, the drive line can be formed of two lines, one working about one hundred yards ahead of the other. This second line will get a chance at some of the smart ol' moss backs who sneak through the first line, think they have it made, and then while they watch the first line of hunters, the second line does 'em in. The hunting principles of blending clothing, scent, wind, etc., apply to driving as well as other forms of bowhunting.

Do not attempt to drive too large an area which cannot be completely covered. If the drive is made quietly, the next drive can be made right next to it. Drives work best when the game has bedded down during the middle of the day.

Whatever type of hunting you wish to learn, experience will play the major roll. For a long time it will seem that deer never do the same thing twice and you never are able to outguess them . . . then all of a sudden, you will make a decision and the animal reacts just as you had planned. From then on, matching wits with nature's crafty wildlife will take on new meaning. Knowing when to shoot and when to wait; knowing when to move and when not to; these are the things no person can tell you and which offer such an appealing challenge with excitment aplenty whether you are successful or not! ●

books for bowmen

NFAA BOWHUNTING MANUAL, Edited by James F. Cavanaugh; National Field Archery Association, Redlands, California; $2.00, 176 pp. This package — in paper cover — is more a booklet than a book, but it still contains a good deal of valuable and practical information for the novice bowhunter.

The introduction by Fred Bear pretty well explains the basics of hunting game, big or small, with a bow. The other stories and articles are, for the most part, apparently reprints from archery journals of the last decade. These articles sport bylines by such personages in the field of archery as Bear, Jack Howard, Jim Dougherty, Richard R. Cooper, and a host of others whose names and abilities are known to archers throughout the country.

And if it's variety you're after, this volume contains a host of articles, ranging from hunting the Alaskan brown bear and the moose in Alaskan climes to pinning frogs. All of the men who write have actually hunted the game about which they write; as a result, the information is practical. Most of it contains important tips which you can put to use in your own hunts.

If you're the traveling type, there are also cost breakdowns concerning some of the safaris into the hinterlands of the nation. These costs are subject to change, of course, but can be used as a general guide in planning such a trek.

And if you're the type who wants to save money, you can always cook what you shoot; there are recipes in the back of the book — with the paid advertising.

All in all, this book would appear to be poorly organized, but it isn't too much of a chore to find your way around in it. The table of contents is self-explanatory. There are numerous photos, too, but due to offset printing, most of them fail to live up to their reproduction potential.—MH.

BOW & ARROW LIBRARY

ARCHERY BOOKS THAT SPEAK AUTHORITATIVELY!

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 woodscraft. 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.**

WILDERNESS COOKERY by Bradford Angier. Here's an amusingly written book that reads unlike any volume of recipes you've ever seen. It's based upon the author's personal experiences in living in the woods, attempting to improve upon cookery of the old frontiersmen. However, all of the recipes make extremely edible fixings. It fills 256 pages with many helpful illustrations. **$3.95.**

Book Department,
BOW & ARROW MAGAZINE
550-A South Citrus Avenue,
Covina, California

Enclosed is $_____ in full payment for the books I have checked below. Please send them postpaid. I understand that I should allow 15 days for delivery.

- ☐ $5.50 New Guide to Better Archery
- ☐ $4.75 Modern Bowhunting
- ☐ $4.95 Bucks and Bows
- ☐ $5.00 Living Off the Country
- ☐ $3.95 All About Camping
- ☐ $3.95 Wilderness Cookery

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(California residents, please add 4% sales tax)

ARROW SPINE

(Continued from page 33)

As the arrow starts its flight it tends to push the bow to the right slightly, which also gives arrow clearance. Once past the bow, the shaft will continue to bend but the amplitude will decrease progressively with the flight of the arrow until essentially straight flight is obtained. The vibration damping that the arrow undergoes is much like that of a tight rubber band that has been plucked.

WITH THESE GYRATIONS of the shaft, one can easily see the importance of the proper, and uniform stiffness in an arrow shaft. If it is too stiff it will not bend enough and slap the bow causing a right low shot. If it is too weak it may not recover from its first bend in time to clear the bow and will usually fly to the left.

We believe much of the work done before by Drs. Klopsteg, Elmer, Hickman and others is excellent in all aspects, but has been — and is — our hope to repeat and expand on some of these and other experiments with the benefit of modern archery and scientific equipment available today.

And it was this hope, of course, that led us to the space laboratory, where we arranged to utilize some of the finest scientific motion picture equipment available.

It is a little ironic, I suppose, when one stops to think that this same equipment is being used to study space materials and reactions under certain conditions, yet a few thousand years removed, we wanted to use the same equipment to study the flight of an arrow!

THE CAMERA we used was a Wollensak *Fast-tex* 16mm high speed camera capable of over 4000 frames per second. Using a one hundred foot roll of film, this would mean it would take only one second (that's right) to shoot the entire one hundred feet of film. Or for additional comparison, a standard sound camera shoots only twenty-four frames per second!

We did not attempt to use the full capacity of the camera and shot at about 2000 frames/second. Unfortunately, being fearful of not releasing the arrow in time, our shot was premature and was recorded on the acceleration phase of the film, thus not giving optimum results. But nevertheless it showed the arrow bend clearly. Some of the shots showing the gyrations of the arrow in initial flight are shown.

This particular test arrow was shot by myself with a thirty-eight-pound Wing bow and Easton XX75 #2213 X 33-inch long aluminum arrows. The 2213 size is 11/32-inch diameter, has a wall thickness of 13/1000 of an inch, and is designed especially for long armed archers such as myself. The spine is .680 which is considered an acceptable value for average length arrows in a thirty-eight-pound bow, but in shafts thirty-three inches long, other problems may arise in shaft-to-bow clearance that are not yet tested or known. Future tests will be made with the more common 28-29-inch length range.

It is interesting to note that, since the introduction of the precision aluminum arrow shaft in 1946, scores have been steadily increasing as equipment and archers have improved. Some of the increase can be attributed to the exact uniformity of spine available with a homogenous, precision-drawn aluminum tube, as it is not too difficult to imagine the errors any variation in spine could produce in the arrow's flight.

To further illustrate the importance of correct and uniform spine, we have included some films taken by Dr. Wayland Marlow, a research physicist from Palo Alto, California. These films were taken with the same type camera at 4000 frames per second.

After observing the flexing a shaft goes through during its initial ten feet of flight, no doubt is left as to the desirability of a properly and uniformly spined arrow shaft.

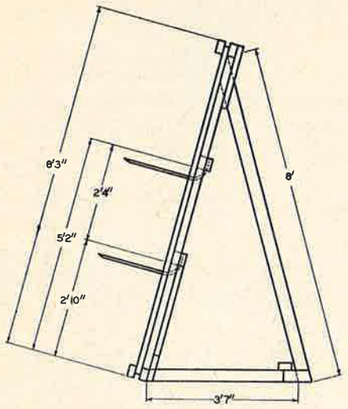
Further tests are planned in order to obtain valid results that will be useful in answering such questions as: What is the proper fistmele or string height for fastest speed and best grouping? What is the best type arrow rest to use? What distance above the arrow should the arrow be nocked on the string? What are the differences in shooting and grouping of thin wall thickness and heavy wall aluminum arrow shafts?

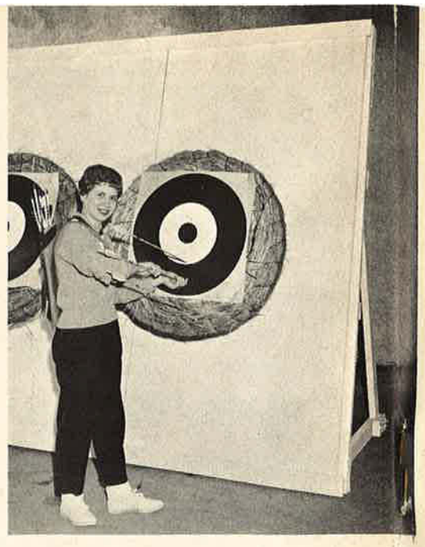
Up to now these — and many more — questions have been asked and answered by trial and error methods only. Possibly some additional scientific data can be compiled that would answer — or at least produce — a proved correct average range of values. That is why we are thinking along the lines of these tests, and have prematurely published these photos that do not give any real answers, but merely attempt to illustrate the complexity and involvement of the apparently simple act of shooting an arrow. As these further tests progress, we hope to bring to you items of interest and use.

I'm sure some people at this point may wonder, why all the fuss about shooting a bow and arrow? The only answer we can give is that something of value to all archers may be brought forth.

And, we enjoy it. ●

Here Are
The Instructions;
If There Are
Pieces Left Over,
You're Sure To
Find A Use For 'Em!





Build A Better BACKSTOP

WITH the aid of plans devised by Chuck Saunders, it's now possible to turn almost any backyard, vacant lot or even your driveway into an archery range.

Of course, in setting up this range, the first thing to be remembered is that arrows are not toys and a few simple safety precautions are necessary. And instead of a trip to the club every time someone in the family wants to shoot, the whole family can get into the act right at home.

With this range, a twenty-five yard marker can be used if the entire family is to compete, or for the youngsters, you may want to mark it off at ten or, perhaps, fifteen yards.

In the interest of safety, attempt to lay out your range so that there is ten yards of clear space on all sides. Lay out the flight zone so that anyone wandering into the area will first be seen by the shooter. Or you can string a temporary rope about the flight zone to keep out the casual strollers.

A forty-yard length behind the target, free of people and property hazards, is the ideal setup, but for those areas not boasting this much space, the simple backstop that is explained here can be used.

If the target matt is supported close to the ground, the height and length of the secondary backstop can be cut from four to six feet, depending upon the archer's accuracy. On smaller backstops, a 1x4 nailed across the top of the back for a stop and a prop of suitable length are all that is necessary for support. A 1½ or two-inch straw insulation board, costing about twenty cents per square foot, can be used. While not suitable for the primary backstop, it can be used if only an occasional shaft misses the matt. In the case of Saunders, either the shorty stand (#SSSC at $3.95) or the firm's #SME 1 ($3.95) will support the matt.

Here's the list of materials required:

Three 2x4, measuring 7'7"
Four 2x4 measuring 8'3⅝"
Four 2x4 measuring 3'7⅞"
Two 2x4 measuring 3' 10"
Three 2x4 measuring 8'
Three 2x4 measuring 3'7"
One 2x4 measuring 7'6¾"
Ten 2x4 measuring 8"
Two 2x4 measuring 11"
Three 2x4 measuring 1'6"

Also required are two sections of strawboard or insulation board, two inches in thickness, measuring 4x8 feet each, and four target brackets. The latter are available from Saunders at a cost of $3 per set.

In the bolt department, we'll need the following:

Six ⅜ x 8" Square Head bolts with wing nuts
Fifteen ¼ x 6" Carriage bolts
Sixteen ¼ x 2" Carriage bolts
Ninety ¼ x 4" Carriage bolts

Okay, so we have all that gear in a neat stack. What do we do now? Well, according to Chuck Saunders, it's simple, and all you have to do is follow the accompanying diagrams.

Start by assembling the front frame first. Next, cut the three 3'7" base 2x4s at the seventy-five degree angle indicated. Then cut the three 8' diagonal braces so that the top angle on each of these is thirty degrees.

Attach the base and diagonal brace to the front frame and tip into upright position.

Then comes the straw or insulation board. First cut small holes for the target bracket and mount. Spacing will depend upon whether you're going to use a three-foot or four-foot matt. Incidentally, anchors should be used at the back if this unit is going to be used outside.

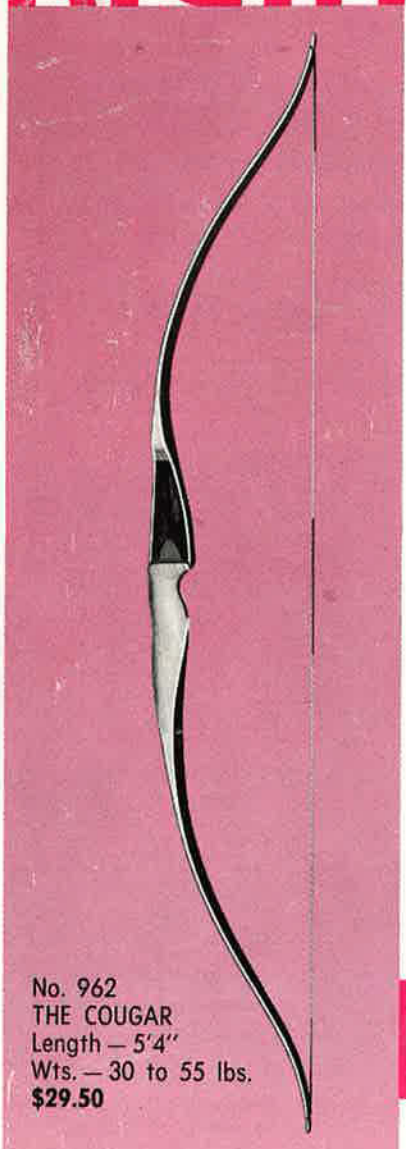
A wooden block the same width as the insulation board should be used at the top and bottom to keep the retaining board square.

These units can be constructed in tandem by spacing them approximately nine inches apart, then running a strip of insulation board a foot in width between the units, overlapping the 2x4s.

What're you going to do with all those short pieces that're left over? Well, according to the diagram, they're used as a series of braces, and they'll come in right handy when a high wind hits your backstop. They'll help hold it together, so use them all.

And if you want more information, Chuck Saunders has the whole thing. All you have to do is write Saunders Archery Target Company, Columbus, Nebraska. We don't think you'll need help, understand, but we've never really been accused of being mechanically minded. There just might be something loused up in those instructions.

START RIGHT...



No. 962
THE COUGAR
Length — 5'4"
Wts. — 30 to 55 lbs.
$29.50

A proper start is important in any sport. In archery, it is vital. If you have a young archer under your wing, you can help him start right by introducing him to Ben Pearson equipment.

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See the Cougar at your nearest Ben Pearson dealer. Its low price will surprise you.

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