



(Display Until Nov. 15, 1996)

INSTINCTIVE ARCHER™

M A G A Z I N E

The Lore of the Bow—The Flight of the Arrow...

APACHE SPIRIT

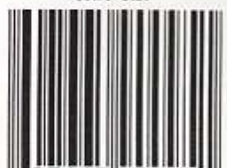
INTERVIEW: Dan Perry

Make it Flemish

—But Make it Simple

Summer/Fall 1996
\$3.95 U.S.

62



6 07665 90095 1

MARTIN



#ML-14
Mountaineer™



#2370
Mamba™



#2800
Hunter™



#2805
Dream Catcher™



#2815
Saber™



We Still Make Them One At A Time!

Fine, handcrafted equipment enhanced by over 50 years of experience. Martin offers a wide selection of bows for the discriminating traditional archer. Compare quality, craftsmanship, materials and price and you will find that Martin recurves and longbows, are without equal.

#ML-14 Mountaineer™ Longbow is a 68" bow designed to please the serious longbow enthusiast. Featuring laminated Red Elm limbs and a Zebra wood riser, the Mountaineer's™ deflexed limb design reduces shock and increases efficiency. Available in right or left hand in weights to 80#.

#2370 Mamba™ Recurve derives its beauty from black stain-impregnated Maple and a satin finish. Shoot the bow that lit the Olympic Torch for the 1992 Olympic Games! The 58" Mamba™ is available in right or left hand in weights to 75#.

#2800 Hunter™ Recurve has been used by successful bowhunters for over 30 years! Widely known for its smooth draw and excellent speed, the 62" Hunter™ boasts exotic Amaranth, Amazakoue and Maple laminations. Available in right or left hand in weights to 75#.

#2805 Dream Catcher™ boasts beauty that will certainly inspire dreams! This new 60" model is crafted from Bubinga, Amazakoue, Red Elm and Maple woods. We are confident that the Dream Catcher™ will stir your imagination and invigorate your hunting season. Available in right or left hand in weights up to 75#.

#2815 Saber™ Recurve is the newest addition to the Martin line. Enhanced performance and a crisp, smooth, natural feel come from combining traditional design and modern materials. The 62" Saber™ is available in right or left hand in weights 30# to 65#.



Martin Archery, Inc., Route 5, Box 127, Walla Walla, WA 99362 U.S.A. • (509)529-2554 • Home Page: www.martinarchery.com

INSTINCTIVE ARCHER™

Summer/Fall, 1996

TABLE OF CONTENTS

7	Apache Spirit	Mark Siedschlag
9	Traditional Korean Archery Equipment	Thomas Duvernay
14	The Archer's Wife	Suzanne Forslund
15	Damon Howatt/Martin Archery—The Story	Scott Toll
19	The Master Fletcher	Hugh Soar
23	The Holmegaard Bow: Fact and Fiction	Errett Callahan, Ph.D.
29	Red Mulberry	Murray Gaskins
31	Keeping Warm	Paul Rodgers
36	Wood Under Stress	Hari Heath
39	At the Makiwara	K.I. Koppedrayner
43	Saxton Pope, Yumis, and Longbows	K.I. Koppedrayner
44	Real Archery	E.T. Williams
46	Medieval Arrowheads	Hector Cole
53	Elk at Ambush Rock	Steve Layman
57	The Long Elm Bow of Vedback	Flemming Alrune
60	Interview: Dan Perry	Paul Comstock
63	An Archer's Mecca	Roy King
67	I was a Compound Junkie!	Bob Solimena
70	Wild Cherry Bark Bow Backing	Robert V. Martin
72	Ten Days in May	Staff
75	Ishi and Elvis —A Review	Paul King
78	Make it Flemish—But Make it Simple	Rik Hinton

REGULAR FEATURES

4	LETTERS TO THE EDITOR	
5	MEET HUGH SOAR, OUR BRITISH EDITOR	
6	TRADITIONAL ARCHERY EVENTS	
6	TED'S TIPS	Ted Fry
32	PRODUCT SPOTLIGHT	
33	CLASSIFIED ADS	
34	THE COMPETITIVE EDGE	By Gary Sentman
76	READERS' SPOTLIGHT	



Letters to the Editor:

Dear Sirs:

I just obtained your premier spring issue, and really appreciate the variety of articles, especially the ones on Howard Hill, Simon Stanley, and all the other historical archery stories. I hope you can keep this magazine as informatively rich and diverse as this one. I know it isn't always possible to procure this much interesting material at all times. But I hope you can.

So many magazines of this nature seem to incorporate too many hunting stories, instead of the quality of this first format. The information is out there.

Again, thanks for coming out will a real neat magazine.

Wayne A. Wild — Jackson, Tennessee

To Rik Hinton;

Congratulations on the first issue of what appears to be a fine addition to our sport. No one publication can be all things to all people and I think yours will fill a definite void.

I have had a fascination with real bows and arrows since the age of 10, 48 years ago. Having seen it all go away, then come back again, it's wonderful to see what young people like you and your staff are doing.

In your first editorial, you ask for suggestions, and I have two.

#1. There are a lot of traditional archers here in the South East who love to shoot our bows year around, starting our 3-D season in January, and going until deer season begins in late September. Many of our tournaments just keep getting bigger and better each year. Hundreds, even thousands attend and have a great time, but very little is written about them. How about some information on the larger shoots? A lot of us would like to know who the winners were, equipment used, etc. Enclosed is a picture of Charlie Vaughn of Sale Creek, Tennessee, who won first place in the Men's Longbow Division on June 15 and 16 at the Traditional South Eastern Championships held at the Robin Hood Archery Range in Elberton, Georgia. There were approximately 300 shooters. He was shooting a 56# Ron Fox longbow and homemade cedar arrows.



Charlie Vaughn, 1996 S. E. Champion. Charlie's name will be carved into the stone behind him with past champions.

#2. I would guess that most traditional archers are average working-class people who hunt when they can and where they can. For most, that means weekends, afternoons, and one or two "applied for" hunts. Many hunting stories written today are difficult for a lot of us to relate to. They seem to be written by a select few for a select few. How about a few articles concerning average people who love to hunt. Not the kind where someone goes to a private game reserve and gets the royal treatment but a real hunt. Far too many articles read like one long advertisement for an outfitter or expensive hunting lodge.

This is the first time I have written to any publication. Thank you for allowing me to express myself.

Keith Woods — Chattanooga, Tennessee

Cover photo provided by Chris Tibbetts. Chris creates one-of-a-kind archery accessories on a custom-order basis, and can be reached at 4330 SW 2nd Ave, New Plymouth, Idaho 83655.

Dear Keith:

Thank you for the photo of Mr. Vaughn, and for taking the time to express yourself so eloquently. We received your letter about two weeks before press time, and I am happy to say that points #1 and #2 have both been addressed in this issue, and will continue to be addressed in future issues.

See "Ten Days in May" (page 72) regarding the Quad States' Traditional Rendezvous and the Western States Traditional Rendezvous. Also, "Elk at Ambush Rock" by Steve Layman (page 53) is a hunting story for the "regular Joe." In this story, Steve is hunting in his home state with a home-made recurve and his best friend. No out-of-state or special tags, no air fare, and no guides. Just two friends sharing the woods in their home state, and after many years of adventures and misadventures, a hunter's first elk.

Dear Sirs:

We are the Italian Longbow Association, and since a longbow association, are quite interested in subscribing to your magazine which seems very interesting. . . We are also trying to promote instinctive shooting here in Italy and therefore would like to contact similar associations or even you to exchange experiences and information useful for this kind of activity.

Sure of your kind cooperation and hoping to get in touch with you soon, please accept my best regards.

Jonata Janelli, President, Italian Longbow Assoc.
Via S. Felice, 135
40122 Bologna

To the Editor:

I have just finished reading the premier issue of Instinctive Archer Magazine. First of all, I would like to commend you and your staff on the informative, interesting, and readable first issue. . . I would hope that you would continue to include articles featuring women and youth so as to attract and interest a wide segment of the population. This may also help the sport become more of a family activity.

Paul Lauzon — Marchfield, Wisconsin

Dear Paul:

We couldn't agree more. See Suzanne Forslund's "The Archer's Wife" (page 14) for a poignant and romantic perspective on what it means to be an archer's wife. We did not receive an archery-related youth article in time to include in this issue, however, we will strive to procure youth articles in our future issues. (Hey readers: if you know of any kids between the ages of 8 and 17 who like to write, please have them send their articles and photos to us.)



Kids on the course at the 1996 Western States' Rendezvous. From left to right: Johnnie Bisterfeldt, Ian Heath, Kaelyn Bisterfeldt, Garrett Cummings, and Brad Wolfgang.

INSTINCTIVE ARCHER™ MAGAZINE

Editor
Rik Hinton

Assistant Editor
Robert V. Martin

British Editor
Hugh D. Soar

ADVERTISING & SUBSCRIPTIONS:
P.O. Box 45299, Boise, ID 83711-5299
(208) 465-9893

U.S. SUBSCRIPTIONS:
One Year: \$12.00
Two Year: \$23.00

CANADIAN SUBSCRIPTIONS:
One year: \$22.00 U.S.

FOREIGN SUBSCRIPTIONS:
One year: \$30.00 U.S.

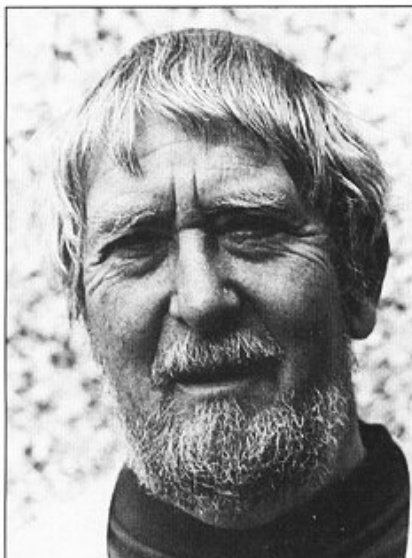
CONTRIBUTIONS:

WE WELCOME YOUR MANUSCRIPTS, POETRY, ARTWORK, PHOTOS, AND SUGGESTIONS, however, you must send them with a stamped, self-addressed envelope (we assume no responsibility for unsolicited material). Send your contributions to *Instinctive Archer™ Magazine* Editorial Office, P.O. Box 45299, Boise, ID 83711-5299.

Instinctive Archer™ Magazine is published quarterly and provides a forum for many different views and opinions from around the globe, however, the information, articles, opinions, and advertising on these pages do not necessarily reflect the opinions of *Instinctive Archer™ Magazine*. We reserve the right to refuse any advertisement. POSTMASTER: Send address changes to *Instinctive Archer™ Magazine*, P.O. Box 45299, Boise, ID 83711-5299. Copyright 1996 by *Instinctive Archer™ Magazine*. All rights reserved.

Instinctive Archer™ is a registered trademark.

Printed in the U.S.A.



Hugh D. Soar, British Editor

Meet Hugh Soar, our British Editor

Hugh Soar, having wintered nearly seventy winters, celebrates his fortieth year in organized archery shortly. Before that were many years wasted in hedgerow bowery with garden canes and avid book reading on whatever archery tomes came his way.

In addition to his duties as our British Editor, Hugh is currently Honorary Secretary/Treasurer of the British Longbow Society, a post he has held for the past ten years. He is a Committee Member of the Society of Archer Antiquaries, and a regular contributor to their annual Journal.

He gained his County Colours in 1964, and has been a Main Grade Coach in modern target archery for the past thirteen years. Although no longer competitive, he enjoys the company of "traditionalists" and writes regularly for the English archery magazines.

As the founder and present Clerk to the Guild of Traditional Bowyers and Fletchers, he keeps in touch with English bowery, whilst as a Freeman of the Worshipful Company of Fletchers, he is also in touch with the ancient "scene."

With Veronica, his wife and partner, he possesses what is probably one of the largest collections of antique longbows and arrows around, and he is happiest when writing about these, and is always ready to show them to selected callers.



Products For Men, Women, and Children. Quivers - Arm Guards

The Classic
Quiver

Plains Indian
Quiver

Stringbags & Keepers

LEATHER DESIGNS BY TIMOTHY L. ABEL

Gloves - Bow Tips - Cases

Pocket Shrew
Quiver

Deerstalker
1 & 2

DEALERS AND CUSTOM ORDERS
WELCOME

Information and orders: 517-676-1901

TRADITIONAL ARCHERY EVENTS

DATE	EVENT	DESCRIPTION/LOCATION
Aug. 18	Seneca Tri-State 1st Annual Carp Shoot.	Hosted by the Seneca Tri-State Traditional Archers. Contestants must have a valid Pennsylvania fishing license, and must register by 8:00 a.m. Sunday morning. This is sure to be a fun event, so don't miss it! For more information, write to the Seneca Tri-State Traditional Archers, 314 Hainer Road, Amity, PA 15311.
Aug. 31 - Sept. 1	Annual Ohio State Traditional Shoot	Hosted by the Ohio Society of Traditional Archers on Labor Day Weekend. For more information, contact Hoot Gibson at (614) 468-3422.
August 31 - Sept. 1	Georgia Traditional Championships	Hosted by the Horse Creek Traditional Archery Club in Calvary Georgia. 3-D targets and novelty shoots, free primitive camping. For more information, contact Cathy D. Slaughter at (912) 377-8276.
Sept. 28, 29	2nd Annual Seneca Tri-State Traditional 3-D Shoot	Hosted by the Seneca Tri-State Traditional Archers. Primitive camping, novelty shoots, speed round, long-shot competition, and more! For more information, contact Bill at (412) 883-2520.

REMEMBER: We offer all traditional archery organizations 100 FREE words to advertise their events, benefits, fund-raisers, etc, in each issue of Instinctive Archer™ Magazine.

TWIG ARCHERY

NEW INTRODUCES NEW
CHUNDOO WOOD ARROW SHAFTING

IF HOWARD HILL, FRED BEAR OR BEN PEARSON COULD HAVE GOTTEN IT, THEY SURELY WOULD HAVE USED IT. STRAIGHT AS CEDAR, STRONGER AND TIGHTER GRAIN THAN CEDAR, 20-30 GRAINS HEAVIER THAN CEDAR FOR BETTER PENETRATION, A SMOOTH FINISH. IT EVEN COSTS LESS THAN CEDAR!! WHAT MORE COULD YOU ASK FOR IN A WOOD SHAFT??? WE

ALSO CARRY "PASS-THRU" HARDWOOD, MAPLE, PINE & CEDAR.

BACK QUIVERS, SNAKESKINS, & ARROW BUILDING SUPPLIES. FREE

BROCHURE. **TWIG ARCHERY, 45194 TR 432 CONESVILLE OH 43811. (614) 829-2847** PHONE HOURS M-F 4-8 PM SAT. 9-5 PM

TED'S TIPS



Ted's Tips are provided by Ted Fry, of Raptor Archery.

- To keep your bowstring from catching on a loose shirt or jacket sleeve, use a nylon stocking leg over your sleeve.
- Five-minute epoxy is a good alternative to hot melt glue when installing broadheads. It allows more time to align the broadheads properly and can still be removed with heat.
- Before staining or dipping shafts, lightly sand them to allow stain to penetrate the surface. This will also produce a smoother finished shaft.
- For more vivid colors when cresting colors other than white, crest first with a base of white, then crest with the color of your choice.

Custom-made Native American **FLAT BOWS** Self or Sinew-backed
STYLES
WOODLAND • EASTERN • PLAINS

For more information, send \$1.00 for brochure to:

Toh-Kah Bows

3010 Westwoodland Tr. N.W. • Shakopee, MN 55379

Toh-Kah Bows

(612) 445-0494



JIM WELCH, bowyer and 2400 lb. buffalo taken with 60 lb. sinew-backed Osage flat bow.

OSAGE SELF-BOW CLASSES AVAILABLE

30-Day Money-Back Guarantee • 1-Year Warranty

APACHE SPIRIT



by
Mark Siedschlag

“Hunger can gnaw at you for days, but thirst will burn in your head until you go crazy in just a few hours.” Those were the last words spoken to me by the weathered old man pumping my gas back at the Quick Mart. In response to his question of “Where ya headin?” I explained my plan of a desert adventure to him. His response back was the warning, and I have the feeling that he knows what he’s talking about. Water is essential for any life to exist. Without it, not a single cell can survive. Where water can be found the living is easy and life bursts forth with little effort. In the desert, life has to fight for every inch. Each day is a constant struggle for mere existence and any casualties in the war may take centuries to replace. Natural selection has honed desert life into some of the most specialized on earth.

For this reason I have always had a great appreciation for the desert. Throw in the raw beauty of the jagged rocks and the way the sunlight colors the cliffs and I can’t think of a more spectacular, yet unforgiving place on earth. For several years I traveled to the desert with my students to explore its life. Today my relationship with the desert is entering a new plateau. No longer will I be just an observer of the desert. Today I’m going to become part of the desert itself. A participant in one of the most fragile ecosystems on earth.

In my hand I carry my recurve bow with a quiver full of arrows. I am going to take my place in the desert food chain as the predator that I am. I planned for a four-day solo backpack trip expecting to literally hunt for my supper. I carry only a few granola bars in case my skills as a hunter prove to

be inadequate. I could tough out a couple of days with just these, but water is different. I carry a gallon and a half with me, enough to get me to my destination with an emergency supply to get me out if needed. On the topo map, about six miles from the nearest road, is a small stream that over the millennia patiently carved out a valley from the solid rock. When I was there last year, the stream was just a clear trickle sparkling in the desert sunshine. An oasis, it provided life for the valley and I plan to use it as my life line also.

I take my first lesson from the creatures of the desert themselves. Imitating their ways, I travel to my destination in the coolness of the dark, thus conserving my precious water supply. My eyes have no trouble adjusting to the dim light provided me by the quartering moon. To those not familiar with the desert, the nights can become surprisingly cold even when daytime temperatures soar. I am not able to shed my jacket from underneath my pack.

The desert at night is one of my favorite places. The stars are so bright they seem to burn holes in the dark sky. The animals are active and several times I hear rustles in the bushes around me as I travel. The songs of distant coyotes pull at my spirit as I make my way east to my destination. I feel very alive and excited at what may lie ahead. I reach the valley just as the eastern sky is lightening.

Ahead, a large rock wall is silhouetted against the sky, marking the eastern border of the valley. As I descend down from the west side to the small stream, the bright colors that signal a new day explode over the top of the cliffs. It’s a

sight I have seen many times before and hopefully a scene I will never tire of.

I sit down on a rock to enjoy the view and absorb some of the warming rays of the sun. My ears fill with the morning chorus of the various birds. Despite the long hike behind me and the weight of my pack, I feel light with anticipation at what four days alone in this wilderness could bring. There is still some work ahead so I shoulder my pack and continue down the rocky slope to my destination.

As my eyes study the stream, looking for rocks to step on to keep my feet dry, I notice a familiar shape among the gravel. I bend down and examine a small stone arrow head. I'm not the first bowhunter to hunt this valley and drink from this stream. This area is famous for being one of the last Apache strongholds. In a land that changes little over the centuries, evidence of the Apache's presence is not hard to find.

The climb up the east bank is steep and rocky and after I fight my way through a wall of acacia, the land flattens out at the base of a huge cliff. This is the area I preselected as my camp site when I passed through here a year ago. The cliff angles out, almost forming a cave. The ground here is soft and the cliff will keep my tent in the shade until mid-afternoon. It is an ideal spot for a camp and I'm not alone in that assumption. The walls of the cliff are streaked with the black soot of ancient campfires from Apache hunters. The dry ground also shows the charred remnants of past fires.

I delay immediately pitching my tent so that I can probe the dusty ground for artifacts. Most of these areas have long since been picked over illegally by collectors and this place isn't an exception, but I am still able to find a small piece of broken pottery. Rubbing the dirt off with my thumb, I try to imagine what the complete pot looked like and what it was used for. I hold it in my hand for a few moments before returning it to the ground.

After my tent is finally up I look out across the small valley and the thought hits me that this rugged expanse of rock and vegetation wouldn't have changed much over the years. The huge giant saguaro that stands guard near my

camp would have only been a few feet tall at the time the Apaches used this site, but it would have been the same one. The very same creosote bushes that I had to squeeze between down by the stream, knew the Apaches also. The cliffs, the rocks; they were all the same. It was a strange feeling of almost going back in time. I could imagine the sounds and smells of a small Apache encampment as they went about their daily routine. I could see the children playing down by the stream as a hunting party returns, and women sitting around the fire weaving yucca leaves into baskets.

The Apache's lived in small loose bands scattered about the southwest. This land would not be able to support a large concentration of people so the Apache's adapted. They loved their land and hunted it's game for centuries, scratching out an existence hunting and growing crops in an unforgiving environment. Although their numbers were small, they were among the last Indians to be subdued to the reservation. They fought bitterly against the Blue Coats to hang on to the desert that they loved so much.

During times of war, they attached their small stone arrowheads loosely to the shaft. This must have made them more difficult to shoot, but once an enemy was hit, the head would have stayed in the body while the shaft was removed, thus adding to the wound. When it finally came to an end, near the turn of the century, the war against the few Apaches cost the U.S. more dollars than any other Indian war.

My mind returns to the present and my first task of securing meat for the pot. The year round water supply offered by the small stream makes this area a game magnet. When I was here before, I was amazed at the number of deer and javelina that use this valley. I had come here to scout the area and see if it would be worth a later return after those deer and pigs, although I don't require much of an excuse to head to the desert. Gambel's quail are also common here and easy to stalk until they wise up. My first shot with a rubber-tipped shaft produced a blur of feathers and meat for supper. Later I would find that getting a shot at these hyper little birds would be the

easy part. Getting them to hold still long enough to actually hit one would prove to be more difficult. I never was able to connect on another one before I finally ended up sacrificing the last of my fire arrows to the rock gods. Granola can get old fast but, I was glad I brought it.

At each daybreak I glass the valley from the eastern rim with the sun on my back. Deer are almost constantly in view until about mid morning and two different bands of javelina call this valley home. The rest of the day, until evening I probe the area in search of more history. On the third day I see a second arrowhead near the cliff only a few yards away from a small rusty horse shoe that probably belonged to a miner's mule.

The Superstition Mountains were famous for its mining. The government would have been content to leave this barren land to the Apache until the wealth that laid buried in these rugged mountains was discovered. It was the miners who spelled the end of the Apache way of life.

I spent these four days alone but it didn't feel like it. There are ghosts in this valley. At night I see them on the cliff in the shadows produced by my campfire. I hear them in the nightly songs of the coyotes, and I'm reminded daily when I remember the stone arrowheads I have seen. The Apaches may be gone now, but their spirit still remains in the land they loved.

I'm always sad when it's time to leave a beautiful wilderness. As the time for my departure nears, it seems worse than usual. There's a tall cliff not far from here called Apache Leap. Locals tell the story about the time a small group of Apaches were trapped on top of the cliff as the Blue Coats advanced. Rather than give in to reservation life, they decided to jump to their death so that at least their spirit could remain in the land. As I put out my last campfire, watching its smoke mix with the other stains on the cliff, I realize I may have been touched by that same Apache spirit.





TRADITIONAL KOREAN ARCHERY EQUIPMENT

by
Thomas Duvernay

In my last article, *Korean Archery—The Way of the Bow*, I guided you through the world of Korean Archery. You were able to look at the art through the eyes of someone who has just taken it up. Now we should look at it from the standpoint of equipment.

Korean traditional archery has a very long and complicated history. You will find many countries west of Korea having similar weapons, especially in China and Mongolia. The Korean bow is relatively shorter than its cousins to the west. The design has not changed significantly in centuries. Let's examine the Korean bow.

KOREAN HORN BOW (gahk goong)

The Korean bows started out made of wood or bamboo, evolving over the years with the attachment of horn and sinew. That is where we find it today. It is, with no doubt, one of the finest, most efficient bows in the world. The present cost for one is about \$700.

In Korea today, there are only ten traditional bowyers. It seems there are few willing to learn their trade to carry on the tradition. Fortunately, one of them, Mr. Bak Geuk Hwan, is a close friend of mine. He has been happy to share his knowledge and expertise with me. Because of my unique position, I feel compelled to gather all the information I can

and share it with other interested people. In this way, the art won't die.

The first things we should look at are the materials used to make the Korean horn bow.

WATER BUFFALO HORN

The horn is considered the most important material, of the many, attached to the bow. It is attached to the belly of the bow. In the past, whatever type of horn that was available was used, generally ox horn. However, the bows made today use water buffalo horn exclusively. It is imported from either Thailand or the Philippines. The reasons for using this type of horn and not others are: (1) it is long enough to completely cover half a bow, and (2) the elasticity is better.

The horn quality is evaluated by the pattern in its surface. The highest-quality horn will have V-type patterns on its surface. Even with this pattern, the evaluation goes further; the pattern should be large, close, and clear. Horn with small, obscure patterns or no pattern at all would be deemed low quality.

SINEW

Sinew from cow backstrap is attached to the back of the bow. The type of sinew is especially important: Korean bowyers

never use sinew from anywhere but backstrap. And the length must be such that it will cover half the bow at one time.

FISH AIR BLADDER GLUE

The glue used to attach everything together comes from the air bladder of a croaker. Again, as with the sinew, a Korean bowyer would never use anything else.

BAMBOO

The core of the Korean horn bow is bamboo. Two-inch wide slats are cut from an approximate three-foot length of green bamboo, four to six inches in diameter. The grain must be straight, with a joint directly in the middle.

MULBERRY OR ACACIA

The siyahs are made from either mulberry or acacia. As acacia is more common than mulberry in some areas, it is frequently used. It must be green and the grain must be absolutely straight. Once I brought my bowyer friend an osage log that had been seasoned for five years. Out of courtesy, he tried making siyahs from it, but I think it ended up as an alternate heating source.

**There is an old Korean proverb that says”
“If an archer can control the bow and the bow
controls the arrow, the arrow will hit its mark.”**

OAK

The handle of the bow is made from oak

ASIAN WHITE BIRCH BARK

The sinew on the back of the bow is covered with a type of birch that is imported from northeastern China. It is soaked in sea water for one year before applying (it should be kept moist until application time).

TOOLS:

DUI JIM: Made from wood or iron, in a half-moon shape; it is used to give the bow its round shape.

DO JI GAE: Boomerang-shaped devices used in bracing and unbracing a new bow

JO MAK SON EE: Used to hold the horn in place when attaching to the bamboo core by winding rope around the two. It is made from wood. It looks like the bottom of a baseball bat cut off, with the top formed into a claw.

GOONG CHANG: A kind of work table, used when cutting, scraping, straightening, or bending.

There are many other kinds of tools, mostly saws, scrapers, adzes, hammers, and files.

BOW MANUFACTURING PROCESS

The proper season to make a bow is from mid-October to early March. The reason being that fish air bladder glue and other plant/animal products are used in the manufacture. They don't adhere well during the hot, humid months of summer. Even if they could adhere, they would be difficult to dry.

First, the siyahs and horn are worked and bent on the goong chang. During the same period, bamboo strips are split from the bamboo log. Then they are trimmed, taking off the leftovers of the joints. After that, they are scored on the inside in an "X" fashion down their lengths. The purpose of this being so they will flatten out when dried. Next, they are put in a vat of water to soak.

While the bamboo is soaking, the siyahs can be worked into a male v-splice. After the bamboo has soaked for a while (about a day), they are heated over a charcoal fire and flattened by pulling them under a foot (covered with a tin can) several times. One at a time, the bamboo slats are bound in a tight circle, several to a bunch. They are kept this way for a day or two. After the bamboo is ready, female V-splices are cut into either end.

The horn has been worked, sanded to approximate dimensions, and grooves cut into its inside portion. The grooves increase the surface area for the glue to adhere to. The horn must be sized (groove side) with glue (as must the bamboo). In total, there will be about seventy coats of glue applied over a one-week period.

The siyahs will be joined to the bamboo core. When the siyahs are set, the horn will be joined to the bow's



A completed horn bow.

belly. They are held in place using the jo mak son ee and rope. The handle is glued on. Next comes the sinew.

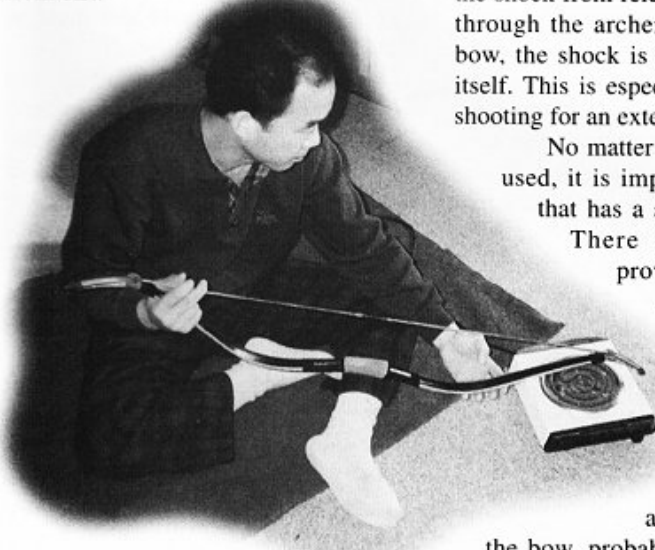
The sinew is applied one limb at a time. The sinew has been previously prepared, having been soaked in glue, strained, combed, and allowed to set. The limb to be covered is heated and the sinew is soaked. The sinew, at this point, is like a long, flat mat, long enough to cover from the center of the handle, up to the reflex in the siyah. The sinew is also slightly heated and laid on the back of the limb, from the handle to siyah. It is rubbed into place and allowed to set (seven or eight days). The procedure is repeated for the alternate limb. This continues on for four layers. The nocks are carved in after this point.

After a curing period, the birch bark is applied one limb at a time to the back, over the sinew. The type of glue used is rubber cement, thinned using benzene.

This process takes about four months. However, the bow will be allowed to cure for several months more, before use.

BRACING THE BOW

The bow should be kept in a warm, dry place (86F, 30C). The modern bow cabinet is heated by a low wattage light bulb. Before a bow is braced, it is removed from the cabinet and allowed to cool completely. When bracing a bow, you should sit on the floor cross legged. The floor should be covered by a blanket, or something, to protect the bow from dirt.



Hold the siyahs firmly, pointing them away from your body. Pull them back, with the handle pressed against the outside of your left knee (the part nearest the floor). Let the rightmost siyah rest over your right knee. At this point, apply the bowstring to either end.

Next, the bow must be balanced. First, the handle area is warmed and the bow is pulled up by both siyahs, while the handle is held against the floor with a foot. Next, each siyah must be heated (using a hot plate). After an end is heated, it is bent to proper shape using a foot, pressing against the floor. This is done until both sides of the bow are balanced.

After balancing is complete, the bow is held in balance using the bow's cover, which is strung around the bow. When the bow is not in use, a four-inch band, usually made of leather, is slipped over the upper siyah, pressing the string down. This temporarily holds the bow in balance. The bow should not be left strung, without use, for more than several hours.

GLASS FIBER (FRP) BOW

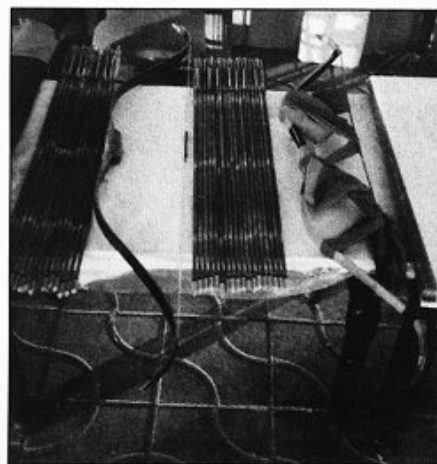
Another type of bow is the FRP bow. It is built like a modern one-piece recurve. It is about forty-six inches in length. Draw weights vary, usually from thirty to seventy pounds. The present cost is about \$250.

FRP bows have the advantages of low cost, ease of use, and insensitivity to heat and humidity. The main disadvantage, compared with the horn bow, is that the shock from releasing an arrow passes through the archer's body. In the horn bow, the shock is absorbed by the bow itself. This is especially important when shooting for an extended period of time.

No matter which type of bow is used, it is important to find a bow that has a suitable draw weight.

There is an old Korean proverb that says *"If an archer can control the bow and the bow controls the arrow, the arrow will hit its mark."*

Conversely, if the archer cannot control the bow, probably the mark will not



From left to right: bamboo arrows, glass fiber (FRP) bow, more bamboo arrows, and horn bow.

be hit. A good test is to draw the string; if you can hold it at anchor for four to five seconds, the bow's draw weight is probably suitable.

BAMBOO ARROWS (JOOK SHI)

The traditional arrow used in Korean traditional archery is made from bamboo. There are only about a dozen traditional fletchers left in Korea. As with the bowyer, one of the fletchers, Mr. Choi Geum Dong, is a close friend of mine.

The only difference between the modern bamboo arrow and those used hundreds of years ago is the point. The point of the ancient arrows was sharp and made from iron; the modern point is blunt and made from machined brass (a couple of decades ago, they were fabricated from brass shell casings). The average length of the bamboo arrow is 31 to 32 inches. The average weight is 26.25g (405 grains). The average diameter is 5/16".

Let's look at the materials comprising the bamboo arrow.

BAMBOO

The bamboo chosen for the arrow should be straight, with three even joints.

BUSH CLOVER

Used to make the nock, this material is amazingly strong. In past times, nails were made from it to build houses. I have never seen a broken nock that was made from it.

PHEASANT FEATHERS

The fletching is made from pheasant feathers. Right handed archers use a left-wing feather, left handed archers use right-wing feathers.

ARROW POINT

In ancient times, archers used sharp iron arrowheads. Nowadays, blunt machined brass points are used, to protect the arrows and targets.

COW BACKSTRAP SINEW

The arrow nock, point buffer ring, and pheasant fletching are secured using sinew that has been soaked in fish glue.

FISH AIR BLADDER GLUE

Used to attach the nock, point buffer ring, and pheasant fletching.

MANUFACTURING PROCESS

Bamboo shafts of the correct weight, thickness, and joints are dried by using a specially-made stove. The stove is cylindrical and uses compressed charcoal briquettes. In the center of the side of the

stove is a couple-inch diameter chamber, in which the shaft is pushed in and out in an even, gliding motion. It is very important to puncture each chamber between joints with a slender awl, to let steam and gases escape while heating.

When the color of the bamboo changes from whitish-blue to yellow-brown, straighten and trim it. In practice, you may have to straighten the shaft occasionally while heating. Use a one or two inch dowel, grooved to use as a straightener. Dampening the shaft with a sponge between heatings is helpful.

Next, the point buffer ring, made from hollow, boiled bamboo (about 1.5") is attached using sinew and fish glue. After that, the nock must be made and attached. The nock-end of the shaft is reamed out about one inch in depth. Then it is wrapped in glue-soaked sinew. The nock, made of bush clover, is covered with fish glue and then inserted. Be sure to check again that the shaft is straight.

Next, the fletching is attached to the body. The fletching is about 4.75 inches long. The rear of the feather (about one inch) should be angled at 30 degrees, for correct turning and stability. The most forward three inches should be shaped in a streamlined fashion. The fletching should be bound at the front by a half-inch band, generally by cellophane paper.

The last procedure is to make and attach the arrow point. In Korea, the

arrow points are bought in bulk from a company. They are made from machined brass. The general appearance is hollow and cylindrical, tapering off to a conical point. The point is attached by placing the point over the point buffer ring; then it is held in place by crimping in several places with a nail-like device.

CRITERIA FOR SELECTING A BAMBOO ARROW

1. It must be made from good quality bamboo.
2. The bamboo joint must be able to expand when heated.
3. It must be perfectly straight.
4. The nock must be shaped accurately.
5. The fletching must come from thick cock-pheasant feathers and must be placed correctly.

It is very important that the arrow's weight and length correspond with the archer's arm length, physical condition, and bow draw weight.

THUMB RING (GAHK JI)

The Korean archer's thumb ring is like that used historically by many nations. Similar devices were used in China, Mongolia, Turkey, Persia, and other countries using the Mongolian draw. Although you may find different styles of thumb rings in Korea, there are two main types. I will highlight the most common type, which is teardrop shaped.



Master bowyer Bak Geuk-Hwan testing a bow. Behind him are numerous archery trophies and a bow-warming cabinet filled with bows.

*Serving the
Traditional and
Primitive Archer
worldwide
since 1984*

Blue Ridge Archery
Wildwood Archery
Howard Hill Archery
Mahaska Custom Bows
Robertson Stykbow
Welchman Longbows
and featuring:
Medicine Stick Selfbows

Custom Wood Arrows
and Accessories

Worldwide
mailorder

Visa and
Mastercard
accepted

Send \$2.
for catalog

**SILVER ARROW
ARCHERY**

106 Fordway Ext. Dept. IA
Derry, NH 03038
(603) 434-0569

There are numerous possible materials it can be made from, such as horn, metal, leather, and even plastic (usually from pool balls cut in thirds).

ARROW CASE (JUN TONG)

Arrow cases are made from paper, bamboo, or wood. These materials are formed into tubes.

They can hold from ten to fifteen arrows. Frequently, they are elaborately carved and decorated. Some of them can cost five hundred dollars or more. Less expensive ones are available (around fifty dollars).

TARGET (GWA NYUK)

According to historical documents, the original targets in Korea were made of hemp cloth. They were approximately ten feet on all sides. Other records say the king used a target made from white-colored bear hide. Feudal princes used red-colored deer skin, and scholars used leather hides with deer and boar painted on them.

During the Chosun Dynasty, the distance from the shooting line to the target was about 130 bo (about 156 meters). The target was about 3.2 meters high and 2.46 meters wide. At another time, the distance was 150 bo (about 180 meters). One other historic target was at 120 bo (144 meters). That target was about 1.96 meters high and 1.37 meters wide.

There were some class distinctions in the shooting distance to the target. The king would shoot 90 bo; princes 70 bo, and scholars 50 bo.

PRESENT-DAY TARGET

The Korea Archery Association standardized the present target and shooting distance back in the 1960s. The present target is 2.67 meters high and 2 meters wide. The shooting distance is 145 meters. The target has an incline of 15 degrees. It is made from pine plywood and covered with rubber (usually from old conveyor belts), to protect the target. The entire surface is first painted white.

It is then painted with a black square covering most of the surface. On the black surface is painted a large red circle. Above the black square is a rectangle, the same width as the black surface; most targets will have a black rectangle—a few will be red, but only if that club produced a general.

... the king used a target made from white-colored bear hide. Feudal princes used red-colored deer skin, and scholars used leather hides with deer and boar painted on them.

SOME FINAL THOUGHTS

I have been involved with Korea for many years and Korean traditional archery for a few. I have been involved with archery, in general, since my parents bought me my first bow (a 25 lb. glass fiber Indian recurve) for my eighth birthday. I have never owned (nor even shot) a modern compound bow. I used to shoot Olympic style (I even own that type of recurve—one that when it has a sight and stabilizers attached, looks like it should be orbiting the earth). However, until I started shooting Korean traditional style, I don't think I really knew what archery was all about.

I feel so strongly about my pastime that I decided to write a book and make videos on the subject. I have been doing so for the past two years. I hope to have a book on the entire subject and a video on bow making ready by this next summer. The taping of the video has taken a long time, as the bow making process is lengthy, but I did it. Now, I am in the process of editing several hours of raw footage into a two hour video.

After that video is completed, I plan to produce one on arrow making. Eventually, I hope to have an entire series, showing all the different aspects of this fascinating art.

I would like to thank all the members of my sa jung (archery club), Ho Rim Jung (Tiger Forest Pavilion) for their continued encouragement and support.

The archers in Korea are very interested in promoting Korean traditional archery in other countries. This fall, the Silla Cultural Festival will be held in my city of Kyongju. I am the only non-Korean, so far, who has ever participated in the national archery competition held during the festival. I hope that will change. The members are considering opening up the competition to include foreign participants.

The rules have been that only a horn bow and bamboo arrows were allowed. Hopefully, the rules can be amended, so foreign participants can use the bare bow and wood arrows of their choice. If you are interested in this possibility, please contact me at the following address:

Thomas Duvernay
Dong Guk University
Suk Jang Dong 707
Kyongju City 780-714
South Korea
Tel. 82-561-771-2291
Fax 82-561-773-2454
e-mail:

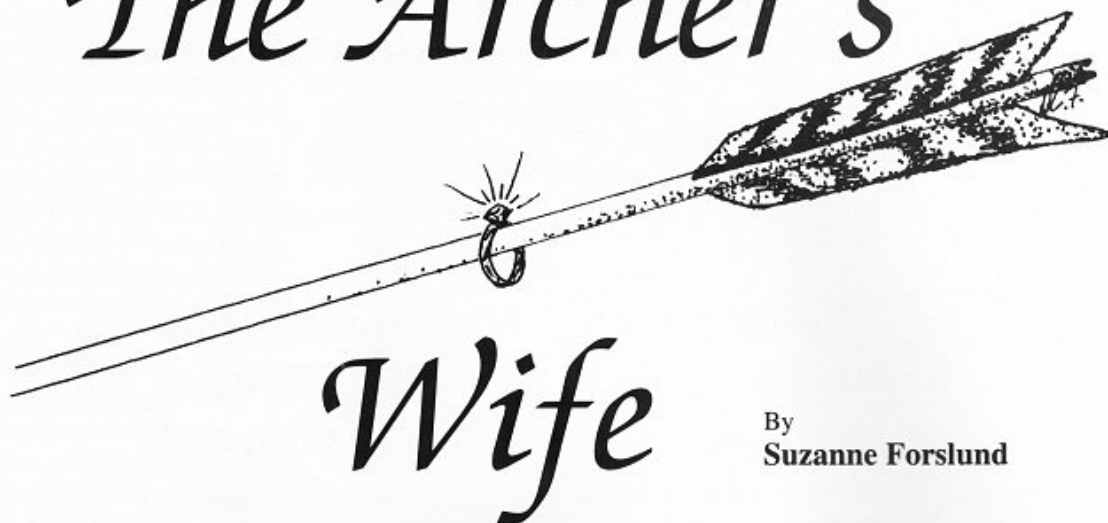
duvernay@wonhyo.dongguk.ac.kr
tduve@sunny.ncmc.cc.mi.us

Home Page:
<http://wwwcs.dongguk.ac.kr/~duvernay/chungho.html>

Editor's Note: Thomas Duvernay is a native of Petoskey, Michigan, in the USA. He teaches English at Dong Guk University in Korea. He has a wife, Moon Ok, and a son, Nicholas Yohan, who is nine years old.



The Archer's



By
Suzanne Forslund

The first time I saw him pull back a bow I sat on the edge of a friend's porch distractedly watching the fickle northwest sun pour through overgrown blackberry bushes at the end of the property. Little did I know then the journey that archery would take me on.

Three of them began a friendly practice with focus and intent. But soon a feeling of competitiveness took hold. Conversation faltered as muscles tightened and arrows flew. I began to be drawn into the feeling of power and determination to strike the bullseye.

I looked at him, eyes fixed on the target, the arrow still, yet seeming to quiver on the string, ready for flight. With a mere flick of the fingers, the string, free, launched the missile as the limbs of the bow sprang back to position. The combination of muscle, aim, and thrust created the deadly journey to a mark that eventually would not be a plastic bullseye but flesh and blood. It was an act of precision and concentration that I found intriguing.

Since then I have seen wheels and cables give way to exotic wood and antler overlays. I have seen a recurve sadly splinter and a favorite longbow sold for household cash. I have seen the lure of the hunt draw the archer who became my husband deep into the forest and also deep into a profession where wood is bent to launch an arrow into space.

I have driven bumpy roads with white knuckles, not speaking but alert to

every flicker of a wing or the twitch of an ear. "Don't look for the whole deer," says he, "just look for a piece." So I look for a back, a head, or a fluffy white tail too many times lifted in retreat. I have marveled at the hours he has spent in a tree stand or crouched cold in the bushes during frosty Montana autumns.

I have given birth to two children during hunting season knowing that an elk could be serious competition for labor coaching. I have seen that first son cant his "sinew-backed Indian bow," flex his muscles and draw to a perfect stance and known that the arrow he shoots now he will follow into his future.

I have answered joyous phone calls and heard tales of successful stalks. I have waited, and waited, and waited past dark looking for headlights, wondering when life will get back to normal, but also knowing that this is normal. I have let out my breath on January 15th and secretly smiled.

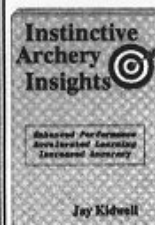
But I know that September will come again. I know that look will return to his eyes. The distance will begin to form between the civilized world we occupy and the wildwood where the creatures stir. The hunters will creep, cringing at the snapping twigs and the crunching leaves. They will silently rise into the trees before dawn and continue a vigil that was begun centuries before, when survival depended on the meeting of an arrow with an animal. And now that perhaps the animal's survival depends on us the vigil goes on and stretches out along

with the shadows of the pines at dusk. The mountains drawing back to them the humans they have always sheltered.

I know that for an archer's wife the lure of the hunt and all that goes with it can create a jealous duel. I know that sometimes I have felt abandoned, but I have also stepped across a marshy meadow and ducked down to watch a badger pull a rabbit into a burrow. I have stood frozen behind a pine tree while a muley doe crashed around and around me then leaped out five feet in front of me, staring me down. I have felt the pounding of my heart and heard the calling of an owl at night. I have at times stepped in and taken my place in the natural world we used to inhabit and be vital to. I understand the wild, and the arrow, and the journey it takes time and time again. I understand what it is to be an archer's wife.



#1 HOW-TO GUIDE FOR INSTINCTIVE SHOOTING!



DRAMATICALLY IMPROVE...

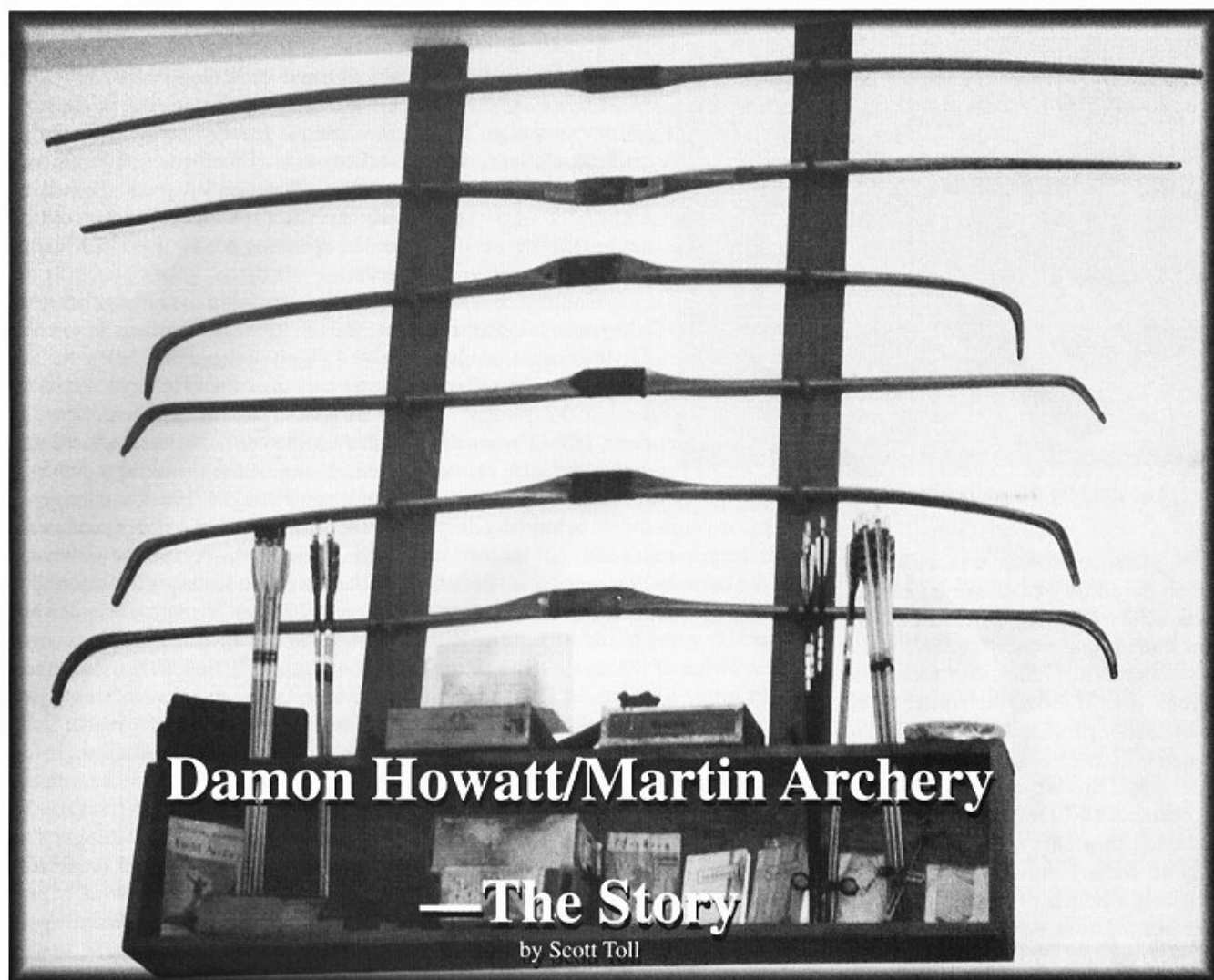
- » ACCURACY
- » CONTROL
- » CONFIDENCE

INNOVATIVE TECHNIQUES BY
JAY KIDWELL,

PROFESSOR OF PSYCHOLOGY.
THE MOST USEFUL AND EFFECTIVE
INSTRUCTION AVAILABLE!

<http://w3.goodnews.net/~jkidwell>
(\$12.00 + \$2.00 S/H)

SEND CHECK OR MONEY ORDER (U.S. FUNDS) TO:
INSTINCTIVE ARCHERY INSIGHTS
P.O. Box 6531, DEPT. IA
FLORENCE, KY 41022-6531



Several months ago I was asked to write about Martin Archery's Ventura recurve. This was an exciting project because I like them, own one, and have always been interested in Damon Howatt and his bows. My father, Russ Toll, hunted Blacktail deer back in the early 1960s with a 66-inch Damon Howatt Hunter, and was very successful with it. He still has this bow today and it is nearly identical in dimensions to the Ventura I have now. As I began my research on the history of the Ventura recurve, which covers more than thirty years, I soon realized that there was much more to this story than just the bow. . .

DAMON HOWATT

According to an advertisement I found in *Archery Magazine*, dated August 1960, Howatt offered their hunter models in 62 inch and 66 inch lengths, in draw weights up to 75 pounds. Today, the Howatt Hunter and Ventura have replaced these older bows. Limb length and shape are pretty much the same for the older, newer, shorter, and longer versions. This limb design has proven itself over thousands of bows and a lot of years. They have changed handle shapes and materials slightly, but have still kept this same limb design.

Recurves were the most popular bows during the '50s and '60s, and manufacturers such as Damon Howatt, Fred Bear, Ben Pearson, and the like were selling thousands of them annually. Each of these archery giants produced complete lines of bows to fit the needs of beginners, bowhunters, and even serious tournament archers. Archery was a different scene back then because archery equipment was much simpler to use. Their only contention back then was whether or not to use sights for hunting. At some tournaments they even had a special class for shooting "Power Units;" that is, heavy weight bows normally used for hunting.

It was during this era that bow builders began using fiberglass as a backing for their bow limbs. Fiberglass-backed bows provided better durability, efficiency, and increased arrow speeds for the poundage used. The average archer could shoot a bow better than before. Archery, as a sport, grew rapidly, creating a high demand for quality equipment. Bows and arrows were mass produced to fill the need, and this reduced their cost. Now, the entire family could afford to participate. Archery clubs began to spring up everywhere. Special bowhunting seasons were introduced for those hunters willing to accept a greater hunting challenge.

Photo: Damon Howatt bows, circa 1938.



Mr. and Mrs. Howatt with some jumbo carp.

Damon Howatt was willing to take on the archery challenge on a much larger scale. He was very fond of big game hunting and archery golf. He was a very successful archer, but was most famous for the bows he built. Even today, archers still know his name through his bows.

Mr. Howatt was in the advertising business in 1938, when he became interested in archery. This happened when an archery movie was playing in town and a bunch of guys at the sign shop started fooling around with the cheap bows and arrows that had been used as "props" advertising the show. It wasn't long before there were broken bottles and busted arrows all over the place.

Shortly after his odd introduction to archery, Damon built his first bow. It was a straight-limbed yew-wood longbow, what we would call a selfbow today. By 1939 he organized the first archery club in Yakima, Washington. At first, bowmaking was only a hobby for him but, soon it became a full time hobby as archery increased in popularity and more and more people wanted to buy his bows. In 1943, he decided to build bows full-time. His first plant was located on a five-acre tract five miles west of Yakima. It was a small building where he and his wife worked together. Damon built bows while his wife built arrows. Their business grew rapidly and it became necessary to build a larger place. They constructed two buildings with a combined space of nearly 5,000 square feet and named it the "Howatt Plant." By 1957, the Howatt Plant was

producing 5,000 to 6,000 bows and 30,000 arrows annually. Most of Damon's hired help were state-ranked archers who had become very skillful with the bow and arrow before they became bowyers. It's no wonder they were producing some of the finest bows in the country.

As a small business, during the '40s, Damon and his wife enjoyed many bowhunting trips and archery tournaments, but by the late '50s, the business consumed most of their time. In 1961, Damon Howatt decided to retire. He sold his business to Bob Paisley, owner of the music stand factory next to him. Six months later, Damon Howatt was killed when struck by another car at an intersection while driving his Volkswagen camper. He was only 57 years old when it happened.

Today the Howatt Plant is owned by Martin Archery, and Larry Hatfield is manager of this facility. I met with Larry this spring and learned most of Damon Howatt's story from him.

Larry met Damon Howatt in the mid-fifties when Damon and a friend happened to be bowhunting near his cattle ranch. Larry was curious about them when he discovered they were using bows and arrows. He asked them about their equipment and then invited them to hunt on his property anytime they wanted. A week later, Damon showed up again, only this time he brought with him another bow, for Larry. They became good friends and started bowhunting together on a regular basis. Not long afterward, Larry started to build bows for himself with some help from the "boys from the plant." Larry recalled when they used to leave a window open at the plant on the weekend so that he could crawl

through and work on his bows when the plant was "normally closed." His interest in archery grew, and he eventually started working for Damon full time as a bowyer. That was 40 years ago and he has never lost his enthusiasm for archery or the operation of this plant in all those years.

Larry gave me a first-class tour of Martin Archery's Howatt Plant. We talked about archery and bows for the better part of a day. He never hesitated to answer any of my questions. For the last two decades, he has endured the many changes that the archery industry has gone through. His knowledge of bows, their design, and bow manufacturing is very extensive. He knows what it takes to produce high quality, affordable bows for today's market. Don Jewett, his foreman, was also there to answer any questions I had. Don has been designing limbs and laminations at the Howatt Plant for the past 39 years.

When we walked through the production floor, it was a very busy place. There are approximately 20 workers doing all sorts of things. The entire place is very clean and organized. It's not exactly what I would call a production line; but rather, a number of small working areas where each worker completes a specific part of a bow. Most of the workers have more than 10 years working experience here. They must like their work because employee turnover is almost non-existent.

The production floor is an exciting thing to see, with its organized stacks of raw materials and bow pieces.



Damon Howatt
Hole-In-One, 1956.

There are machines of all types being used for a multitude of tasks, such as producing double-tapered laminations and the cutting of riser materials prior to glue-up. The dozen or more bow presses are located in one corner of the production floor. These presses are state of the art with electronic sensing devices, computer controlled heat strips, and timing devices.

The tillering and shaping of the bows are done by hand the same way as any other custom bowyer would do it. They make their own laminations using a special machine which Damon Howatt designed and built. It works so well that there is no need to attempt to improve it. After the laminations are ground, they are individually flex-tested and marked for identification. A myriad of other machines are used to produce the other riser materials needed for constructing the bow. Once the raw materials have been reduced to usable pieces and then glued-up in the presses, except for a few rough cuts, the bow is finished using hand tools.

Recently, I was at an archery shoot and had a conversation with an "old timer," who used to work for Howatt in the early '60s. His name was Gerald Rimbey. He was a bowyer then, and also the Northwest Regional Champion instinctive archer at the same time. He told me, *"We only had five or six bowyers at that time and maybe 10 more workers. Bowyers were responsible for shaping the limbs, tillering the bow, and aligning the nock grooves. The rest of the workers would cut raw materials, glue up the bows, and then finish the bow."*

There were several bowyers working at the time I visited the plant. I was impressed with the skills they were using to align and mark limbs, set the string grooves, and tiller the bows. Larry Hatfield and Don Jewett certainly know how to select good workers. Each worker will complete a single task for 30 to 35 bows each day. Larry explained to me that they can produce a higher quality product at a much more affordable price by having each worker specialize.

There is nothing lacking for quality in this place when it comes to machinery, raw materials, or workmanship. The Howatt Plant is even building

bows for their competitors. I recognized these bows immediately and knew that these bows were selling for about twice the price of a Martin. It's no wonder they're not worried about their competition.

It's not fair to call these bows production models because they build them exactly the same way as any other custom bowyer would. The Howatt Plant buys raw materials in huge quantities and then reduces it to usable parts. By doing so, they control the quality much better and can still offer bows at a much lower cost. As each worker completes his or her task, the bow is then passed onto another worker where it will be inspected one more time. It is highly unlikely that a bow will make it past 20 people if it has a flaw in it. If there is anything wrong with it, even a blemish, they discard the bow.

THE VENTURA:

The Ventura is an exceptionally easy bow to shoot accurately because of its longer riser. It's limbs are nearly the same length as most other shorter hunting recurves on the market. This is an ideal combination because a longer riser provides better stability while the shorter limbs produce greater arrow speed. It is a fun bow to shoot in the field and on the range. The Ventura is an easy bow to shoot from both a vertical (target) or canted (hunting) bow position because it is a very stable bow.

It surprises me that the Ventura is considered more as a target bow than a hunting bow. It makes an excellent hunt-

ing weapon because it is so "shootable" and is available in draw weights up to 75 pounds. There are only a few 66 inch or longer, one-piece, wooden recurves available on the bow market today and Martin produces about 500 of them annually.

The statistics for my personal bow are as follows:

Length: 66"
Draw Weight: 50# at 28"
String Length: 60 3/8" (using 3/8" dowels in loops)
Brace Height: 8 1/8"
Sight Window: .200" out from center
Arrow Shelf: 3" above center

I like to use a chronograph to test a bow for its consistency in casting an arrow the same speed each time. **Consistent arrow speed is a good indication of its "shootability," and this can make a big difference in long range accuracy.** It is also important to compare relative speed differences when shooting light or heavy arrows. Faster does not mean better; however, and it is much more important to use a chronograph to find out which weight arrows produce the most consistent speeds when arrow weight might vary slightly.

I was able to produce my most consistent speeds using the lighter weight arrows. This is probably due to the lighter mass weight of the limbs which is so common with recurves.

I tested this bow using my 31-inch draw length, which I controlled by having an archery friend watch my arrows as I drew them and anchored. At



**UNIQUE CATALOGUE OF
INTERNATIONAL ARCHERY EQUIPMENT**

full color catalogue - four dollars

RD #1 Beechwood Road
New Wilmington, Pennsylvania 16142 USA

4 1 2 . 9 4 6 . 8 3 3 2

this draw length my bow has a draw weight of 58 1/2 pounds. Test results were as follows:

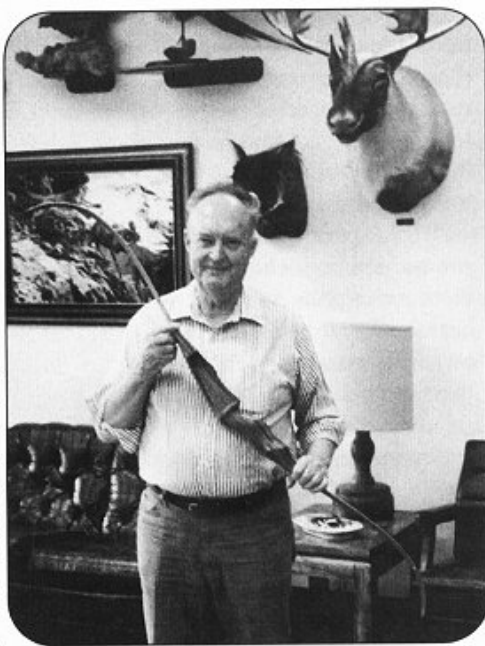
509 grain arrow avg. = 189 fps
 554 grain arrow avg. = 181.7 fps
 608 grain arrow avg. = 179 fps

These test results show that the heavier arrows will produce more consistent arrow speeds when arrow weights vary; such as when using wooden arrows. I must use aluminum arrows when I shoot my recurve because wooden shafts are not available in the length and spines I need. But, if I were able to obtain wooden arrows, I would use them in the heavier weights. Aluminum arrows are so closely matched in sets that it's a matter of (1) personal choice and (2) which arrow trajectory is most desirable for the archer.

Martin Archery sells most of their Venturas to the Europeans as FITA training bows. The Federation Internationale de Tir a L Arc (FITA) is Europe's version of our own National Archery Association (NAA). The NAA's stated purpose is **"... to perpetuate, foster and direct the practice of archery in the United States in accordance with the high spirit and honorable tradition of that most ancient sport."**

Comparable to Olympic competition in format, they both shoot multiple arrows at each target and include some very long-range shooting. Full-blown Olympic recurves are very expensive by the time they arrive in Europe, costing somewhere in the neighborhood of \$2000.00. Venturas are a fraction of this cost, enabling many more archers the opportunity to participate in archery.

The Ventura was first offered by Howatt (now Martin) over 30 years ago as an affordable target bow for the average archer. Top-of-the-line target recurves with their custom fit handles and exotic woods were three times as expensive. According to a 1964 news release by Howatt, *"At \$44.50, the Ventura was added to fill the need for a quality bow at a modest price. This was accomplished by eliminating many of the custom options available on most Howatt bows. Length, handle style and bow glass color were also standardized on the Ventura."*



Gail Martin with the new "Dream Catcher" recurve.

The Ventura will break all the rules when we try to decide which shooting form or style is best suited for it. It will accommodate target form; that is, using a vertically-held bow and a low anchor; or hunting form, which involves canting the bow and using a high anchor. It is quick handling and can even be used like a longbow for moving targets. It really depends upon the archer and for what purpose the bow is being used.

This year Martin is offering two new bows: the "Saber" and the "Dream Catcher." The Saber is a 62" recurve with lines similar to Howatt's famous Del Rey target bow which was built in the early '60s. The Del Rey was their top of the line target recurve and was offered in 62", 66", and 69" lengths. The Del Rey was a very expensive bow (\$150.00) at the time and even came with a padded suede carrying case. The Saber is actually a shortened version of the Del Rey and is better suited for the bowhunter.

The limb design and riser configuration of the Saber is completely different than Martin's other recurves; It is more reflexed. When unstrung, the entire bow will lay flat on its belly when placed on the floor. A more deflexed bow will only touch at the middle of the limbs and the handle will be an inch or more higher than the floor.

When I received this bow I hardly looked it over at first because I

was so eager to shoot it. I grabbed a half dozen different spined sets of arrows, stuck a feather rest on it and went right to it. Within fifteen minutes I was able to match up some arrows and shoot it very accurately. This bow was rated 55# at 28" and so, by the time I stretched it out to my 31" draw length, I was pulling 72 pounds. Even at this poundage, I could shoot it comfortably. A bow of this length is much better suited for someone with an average draw length, nearer to 28 inches. Even so, I enjoyed shooting this bow and it felt very stable.

The "Dream Catcher" is Martin's newest bow, so new in fact that I was unable to obtain test results prior to press time. The bow is named after the famous Native-American artifacts that, according to lore, filter dreams and only allow the good dreams through. The Dream Catcher is a custom-built, 60" recurve featuring an eye-catching combination of Bubinga, Amazakoue, Maple, and Red Elm. Each bow has a drawing of a dream catcher on the riser, and is available in weights up to 75 pounds.

GAIL MARTIN

As I mentioned before, Martin Archery now owns the Howatt Plant. In 1976, Gail Martin purchased the Howatt Plant from Bob Paisley. At that time, Gail was the largest bowstring manufacturer in the U.S. along with building and selling arrows. Eventually Gail expanded his facility in Walla Walla, Washington, to accommodate a quickly-changing archery industry. Today, Martin Archery manufactures the most complete line of Archery equipment in the world.

When I visited Martin Archery's Walla Walla facility, I was very impressed with their collection of bows. There were countless numbers of fancy recurves from the past, displayed on their walls, along with old broadhead collections and Indian artifacts. Besides the recurves, there were Asiatic bows, longbows, self-bows, and even some very strange bows I'd never seen before. If a person has an interest in older and rare bows, or the newest that Martin Archery has to offer, I would highly recommend a visit.



THE MASTER FLETCHER

—A Story of a Craftsman-artisan

by
Hugh Soar



Where he lived, what his wife could wear, what he and his family could eat were all decided for him by Order of Authority, the fletcher's lot, like that of Gilbert & Sullivan's Policeman "was not an 'appy one!" For all his humble calling however, the fletcher was a king-pin of medieval Society. For did he not make the battle-shafts which matched the great war-bows that defended this Island from its enemies? And the hunting arrows that put food into bellies?

Whether a master of his craft, an engager of apprentices and a member of his Guild,—or perhaps a journeyman working for a master, regulations laid down centuries before set out the ground rules for both his working practice and his behaviour.

THE STORY STARTS. . .

In 1371, fletchers of the City of London had petitioned the Council of Aldermen to allow the separation of their trade from that of bowyers and, this being granted, the Worshipful Company of Fletchers was formed. Unlike most of the earlier Companies, it had no Charter and was thus a Company by "Prescription" only.

Of those trading then as bowyer & fletcher, all except four accepted the ruling. These four argued successfully that with apprentices bound to both trades, and bows and arrows finished and ready to sell they would suffer unduly if they kept the agreement.

Given a couple of months grace to get themselves in order, all but one had by then decided what they wanted to be.

The vacillation of this last character proved something of a problem however, and eventually the Mayor made his mind up for him by decreeing him to be a bowyer! Seemingly though this wasn't to his liking either, and obviously an individualist, he finally ended up as a fletcher!

Other Petitions followed over the years. Wardens were appointed to see that arrows and quarrels were of good dry wood, and had hard heads. Whilst, so as to ensure good workmanship, none were to be made at night.

"The folke of the said trade in the said Citie shall have power everie yere at the Feast of St. Edward the King (January 5th) to elect two persons. . . to survey and make seache during the year. . . as to all maner of arrowes and heddes of arrowes and quarrels. . . and that they shalle have power to seize suche artillerie as shall be founde false and deceitful. . . the persons who shall have made suche false worke to be punished. . ."

Sunday trading was banned, as was selling at certain Festivals. No Freeman might employ a journeyman elsewhere than in his own house in order to oversee his work properly.

The "Fellowship" agreed to meet at ". . . some honest place to them thought convenient. . ." Anyone not turning up was to pay 6d, or donate one pound of wax! Whilst every three years, members were to meet formally clad in ". . . livery, and a suit."

Swearing at the Warden or a fellow member with "unfitting or unmannerly words or language" brought with it an automatic fine of 3s 4d. Thus, one Thomas Smith was suitably financially rebuked in 1527 for being rude to the Lord Mayor.

Rates for the job were fixed by the Wardens; for 100 best quality "bearing shafts," (that is shafts that flew cleanly and well), 16d was to be asked. Others of lesser quality cost

14d, whilst "mark shafts" for butt and target or "rood shooting" commanded a healthy 20d per 100, no doubt reflecting the additional work in pairing and "twirling" (qv) to match pairs. Oddly, no member was to set more than two sheaves on his stall at any one time.

Other fletcher Guilds were formed outside London. That at Chester, although perhaps not as ancient as its London counterpart, could only have been a little younger. Interestingly the Heraldic Arms of this Guild differed significantly from that of the London Guild, an indication that perhaps they lacked "official" authority.

The Motto of the Chester Guild... "FLY FAR WITH FAITH" also differed from the "TRUE AND SURE" of their London brethren.

The smaller Guilds probably had no formal heraldic "achievements," none is known for the Bristowe (Bristol) Guild, whilst in many towns one man doubled not just as bowyer/fletcher, but as archery jack of all trades (and hopefully master of them all). Thus, the fletcher at Bath, in Somerset was regularly paid to mend not only bows and arrows, but also "wardbrasses" (bracers), and shooting gloves.

Creating a Guild followed a well-established practice. When in 1479 the bowyers and fletchers of the town of Bristowe wanted to form a Trade Guild, they wrote first to: *"The Right Worshipfull William Spencer, Maire of the Towne of Bristowe, John Skreven Shreef (Sheriff) and to the conmen Counsaile of the said worshipfull Towne."*

To plead that: *"They nor their Predecessours of the same occupacioun in tymes past were neuer admytted nor takin for a Crafte to go Assemble and accompanye as othir Crafttis haue and ought to do to the worship of this Towne. . ."*

The bowyers and fletchers of Bristowe had no corporate identity of their own at that time; their interests were looked after by the Guild of Hoopers—probably because the Hoopers who made barrels, used much the same tools.

Although as craftsmen in distinct trades they wanted their own Guild,

they apparently still intended to work closely with the Hoopers, since they asked that they and their successors *"... contynue and endure to haue as large and Ample libertees as the craftt of Hopers in this worshipfull Towne haue, goinge, Accompanyeng and assemblyng with them, and they with us in all maner of watches and wardes."*

The request was granted by the Court of Comon Council, and the Ordinances, or Rules of their Guild were duly set down. Firstly: *"Two able persons of the said Craft of Bowyers and flechers be chosen bi commn Assent of all the Masters of the saide Craffte or the more parte of them euery yere the morowe after the feste of Seint Michell (Michaelmas - 29th September) as wardenis of the said Craffte."*

These Wardens had authority to check over the work of the other Guild members and to report any who didn't come up to scratch, and in common with the London Guild their powers were quite considerable. qv.

Back in Bristol, the Guildsmen fletchers were permitted Apprentices, but could not engage them for *"... lasse than the terme of vij (seven) yere at the leste so that he may be Sufficient and able in konnyng (cunning) of the said Craffte at the end of his terme foresaide. And that he be no Rebelle of Irelande nor Alyen, but liegeman boren to the Kyng oure souueraign lorde. . ."*

The hire of journeymen was also well covered by the Ordinances. They had to be known to and approved by the Wardens; working by the week they were to receive xijd (one shilling) and food and lodging but with Holy Days off. Rather a busman's holiday however, since the law required them to practice archery in their free time!

"Foreigners," (a term loosely applied to anyone who lived outside the town or city limits) were allowed to sell their wares, but only in specific places, almost certainly where the Wardens could both keep an eye on them and occasionally inspect their work.

All was not graft however! When the Bristol Guild came together with its fellows to celebrate St. John's, and St. Peter's nights, (times of general jollification) it was provided with two gallons of wine at the expense of the Mayor, and the Sheriff. As an aside, this was the smallest amount allotted to any Guild, surely an indication of its size rather than its capacity! The Hoopers received three gallons, as did the "Barbers and Wax Makers."

The reference to the Barbers is interesting since curiously, in Bristol, they doubled as longbowstring-makers and engaged apprentices accordingly.

The taking of an apprentice was no idle matter. The Master and his wife both signed to observe the terms of the indentures; in some cases this was of practical purpose for if the Master died, his widow took responsibility, subsequently engaging apprentices in her own right. Unlike bowyers (of whom but the one female has ever been recorded) there were some women fletchers. Even today, although the Worshipful Companies of Bowyers, and of Fletchers in the City of London are each male dominated, only the Fletchers Company enrolls women as "Freemen" (my own wife is, with me, a Freeman of the Company).

Indentures, whether of fletchers or other crafts are legally pedantic and make turgid reading, so to get the gist lets imagine a talk between John Whyting, Master Fletcher of Bristowe, and newly-apprenticed Yerothe



SHADOW
Custom Bows

**Handcrafted Performance
Lifetime Guarantee**

SHADOW BOWS: (406) 475-9443
3689 Keir Lane • Helena, MT • 59602

Apyevan, Welsh-speaking son of Yevan Apdavid, a Miller of Llandeenny, in Wales. In the background is Geoffrey Rowdisley who is about to finish his apprenticeship. It is early morning and the working day is about to start.

The year is 1550. The boy-king Edward VI is on the throne. The country is settling down after the rebellion and unrest in the West Country and Norfolk.

John Whytirig: 'Good morrow, lad. Slept you well?

Yerothe: 'Deolch an vawr Syr, bore da chwi.' J

John W: 'Siriad yn saesnaeg!' Speak in the English tongue boy. 'Nid cymraeg yn Lloeg!!' No Welsh here in England..

'I will do as you wish Master. I was warm beneath the bench and my rest was not disturbed. I have broken fast, and am refreshed.'

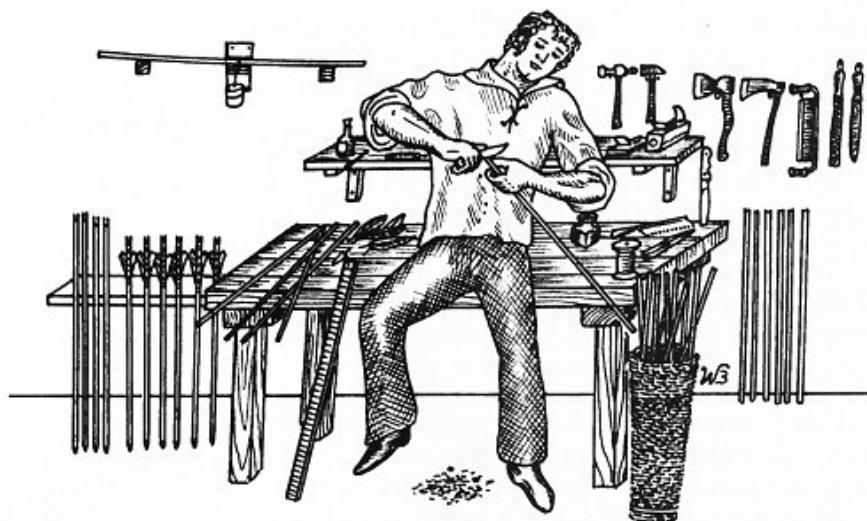
'I will see that you have fresh straw, and clean bedlinen on which to lie, and you should know that this will not be for long for, by Friday sennight, Geoffrey here completes his term and will leave. You are then to have his bed and to sleep in the outhouse.'

'Now, I shall tell you of your service with me, and you must take care to understand these matters. You shall serve me faithfully and in the manner of an apprentice, from Michaelmas to the end of seven years next following. For my part I shall inform and instruct you in the craft and mysteries of fletching, which as you well know, is the making of arrows. In this I will explain the buying of wood and the selling of wares as best I know how.'

'You shall do me no damage during your time, neither shall you lend tools without my will, nor waste my goods. And above all you will conceal my secrets as they were your own. On Holy Days, or after work-days you shall not frequent taverns, nor gaming-houses, nor brothels.'

'You shall not contract marriage with any woman, nor marry her within the term of seven years, unless it be with my leave, and by my express will.'

'For thy loyalty I shall provide you with food and drink, linen and



woollen cloth, bed and footwear and such necessities as become your station, and these I will give and ordain throughout your term.'

'Touching upon your free time, you shall attend to your usage of archery as the law requires, and I shall provide for you with two arrows and a bow of elm for your practice and disport.'

'When the bell tells noon, and during your dinner time, you shall not leave your place of work passing the time of half a mile away - which is to say ten minutes from your work-place.'

Yerothe: 'Deolch an. . . I mean, pray thank you Master, I vow that I shall observe these matters as I am able, and pray that I shall not bring your wrath upon me by foolish mistakes. I am eager for my instruction and trust that you will not think me forward in my eagerness to learn.'

Master: 'The bell has smitten noon, and it is dinner-time. When we have eaten I shall tell you of the severall parts of the arrow, and of divers fletchers tools'.

It is the afternoon. . .

Yerothe: 'Dyma fi Syr... your pardon Master, English does not come readily to my tongue. But, I am present, and have eaten.'

Master: 'I hear you. Then we will begin your instruction. Here is an arrow. The shaft is the wood part of this arrow, and this is the nock-piece; it is of horn. This is the slit into which the nock-piece fits, and this is the nock into which the string fits.'

'If I may question, Master. From whence comes the word nock?'

'You try my skill at memory lad! It comes as I have heard from the language of Dutchmen and was the slot at the mast-end of a sail-spar.' Now, again to the lesson! These are the feathers, which sometime are pieced if they break. This is the cock feather which stands contrary to the nock. It is of gray colour that it be easy seen for speedy nocking in battle.'

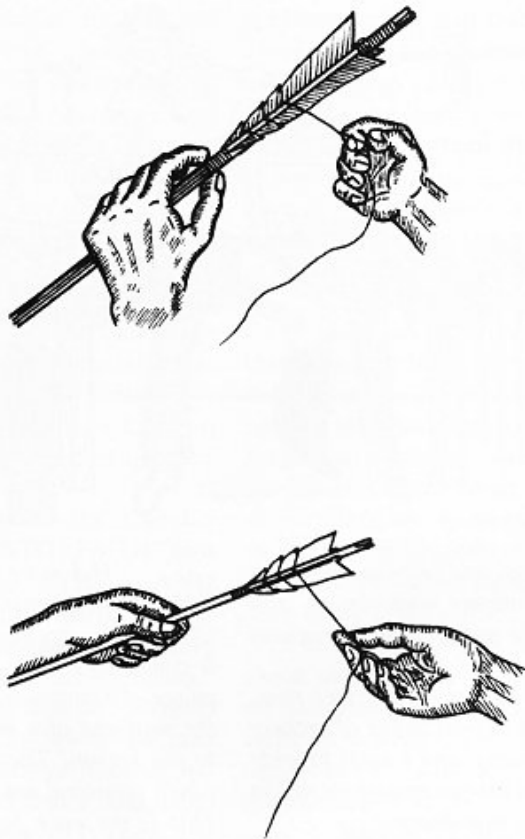
'This is the footing, which we call piecing and is the setting of one part into another'

'Why, Master is this so?'

'You have asked well; for a hard footing will be the saving of a good shaft. If itself be broke it may be mended by replacement. Also know that shafts will fly the better by their forward weight, or so archers do say, and our wares must be as they wish!'

'The pile-head, or point is the iron or steel socket upon the shaft's end; whiles for war is the barbed or bearded head in use, or the pointed bodkin. The forked pile is in use also, but oftimes for unlawful taking of game and is to be avoided.'

'Now, I will show and tell you of the diverse tools that fletchers use.' They are a plane, or a shave. And of these be two sorts. A ripper to make the rough wood something that may be fashioned and put in some form, and a hollow shave which worketh the same smooth and round and fit to be made into an arrow.'



'Of saws there is a framing, or slitting saw set in a frame of iron with a handle to take off or on. With this is the nock for the bow-string made. And there be gravers or rough files of a likeness set into handles.'

'And there be both round, and drawing knives to pare and rib the feathers, and shears which be long scissors with which to shape them. Of all these will you learn the use.'

'And now I shall ask Geoffrey to make an arrow and you shall see. Firstly he will take a staff. This is the first cleaving of timber to make a shaft. Now he is pointing of it out, that is to say cutting it round with a knife out of the rough.'

'See he now rips it to give it the first round, and then he will shave it with a hollow shave. After he will smooth it. That is to say he will polish it with skin from a dogfish; an ugly monster with tender flesh, but tough rough skin.'

'Now he will slit the shaft, in which to place the horn piece for the nock. This do we call the nock-piece. Now see, he cross-slits to cut the nock of the arrow. Thence to fitting of the head, and the glueing of it to the shaft.'

'Next the drawing of the feathers, and the cutting or stripping from the quills—take care Geoffrey that you do not sprangle the vanes. See, now Yerothe, he pares the feathers, cutting their backs to make them lie close. Now he ribs them, by taking away the side-skirts, and then cuts them to a length for shape and breadth.'

'If needs be, he will press the fletches within a wet cloth, to keep them even and straight.'

'Glazing, or varnishing the arrow with glue must now come, and this is to rub it over as far as the feathers go with glue. Then is he feathering the arrow by glueing on the feathers. See you how he does this? He takes a fletch and dribbles a little hot glue from the pot, then placing it deftly on the shaft, he blows upon it, to quickly cool the glue.'

'Next is to cut or pare the feathers even and all of a length or breadth, and then he will poise the arrows to know whether a pair be of equal weight as they are of length.'

'Lastly will Geoffrey turn them, giving them a twirl to know whether they be straight. And thus is the arrow well-made! 'Gwerrssi anoth yaon!!'

'Your Welsh tongue is good Master, it is indeed a difficult lesson to learn. But, by your sometime instruction I know that I shall understand these matters. 'May I question further?'

'Surely, lad, what is your question?'

'I know of my childhood I had use of halfpenny ware for disport and play. Of what wood were these made?'

'You ask well lad. Halfpenny ware is of rough asp, which men call poplar and have blunt heads whereof shall be no harm. Ordinary ware, and arrows of the better sort are of ash, or birch or other diverse woods. They be pieced as I have described, with holly or brazil and have ridged, or shouldered heads, or silver-spoon heads as men know them. And they are paired to stand well in a bow and fly true as bearing shafts should do.'

'Now that is all for this day. The sun is setting and we must change our linen to join Mistress Whyting and your fellow Geoffrey for the supper meal.'

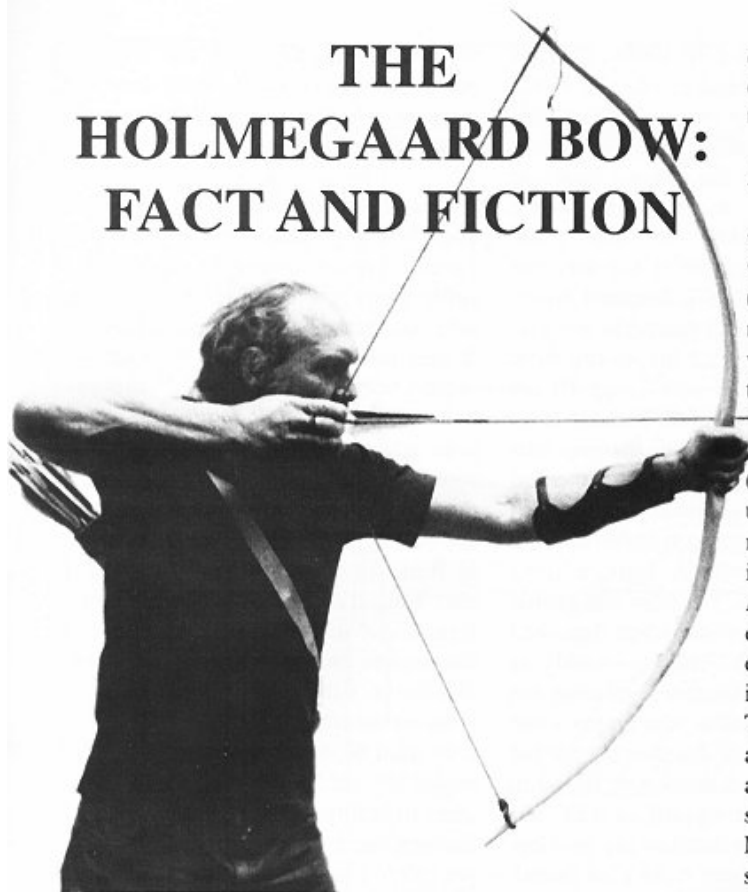
There is no trace of young Yerothe, or Edward as his name would be anglicised in the records. He would have finished his time in 1558, returning perhaps to Llandivenny. One thing is certain, he would not have made his fortune.

Fletchers, like many other artisans were seldom far from poverty. Evidence from Inventories taken at their deaths show how little were their worldly goods worth. Henry Cockly of Norfolk who died in 1589 owned working tools valued at 5s, whilst Richard Hollister of Bristowe whose Inventory was taken in 1625 doubled that, at 10s.

The Bristol Guild, with those of York, and Chester are long gone. The London Guild survives as a charitable Organization, although still with links to archery through its close association with the modern Guild of Traditional Bowyers & Fletchers which serves the British Long-Bow Society. It maintains its old structure however, with a Master elected annually, a Court of Assistants, a Clerk, its Livery, and Freemen. Long may it continue to honour its proud motto: "True and Sure."



THE HOLMEGAARD BOW: FACT AND FICTION



(An updated version of an article first appearing in
The Bulletin of Primitive Technology, Fall 1994.)

Text, Illustrations, and photos by

Errett Callahan, Ph.D.

INTRODUCTION

In recent years there has been a lot of commotion, at least in the USA, concerning the oldest known bow in the world—the Holmegaard bow from Denmark (9000). During the summer of 1993, while researching Neolithic flint daggers in Denmark, I took the opportunity of examining the original Holmegaard artifact in detail. Dr. Poul-Otto Nielsed of the National Museum in Copenhagen kindly made arrangements to have the bow removed from its display case and made available for my examination. After being guided through seven locked doors deep in the basement archives of the National Museum, I was at last alone with this most famous bow. I had available for study not only the bow itself but a recent plastic cast made by the museum conservators, accurate to within 1/1000". The advantage of having the cast was that the four pieces of the bow could be picked up and turned around and examined in detail, whereas the original was strapped down to a board and couldn't be manipulated. The cast allowed me to scrutinize the end grain, while neither the end grain nor the flat belly of the original could be examined

directly. What's that you say? The flat belly? But I thought everyone says the flat side is the back and the round side is the belly. Let's back up and look at this matter closer.

ANALYSIS

One of the principle objectives of my examination was to determine once and for all which side was the back and which the belly. After reading my Rausing (1967), Comstock (1988, 1993), Hardy (1986), and Baker (1992, personal communication), I assumed, along with everyone else, that this was an example of the backwards or reverse-grain bow, with the flat side being the back (see Comstock 1993:91).

But then along comes this article by Flemming Alrune in the *Journal of the Society of Archer-Antiquaries* (1992), which states that the flat side was the belly. I started up a three-way correspondence with Alrune and Baker and made it a point to visit Alrune in Denmark during my upcoming trip to discuss this very problem. I soon found out that Alrune is not just another fly-by-night abo bowyer. He has examined in detail and made numerous reconstructions of each and every prehistoric bow found in Denmark. These include all the bows from the Mesolithic sites of Holmegaard, Tybrind Vig, Vedbaek, Aamosen, Ringkloster, Lystrup Enge, and Ulkesturp Lyng—we're talking about 9000 to 6000 years ago folks—and from the Neolithic, Bronze, and Viking Age sites. [The Neolithic bows from Agerod (Sweden) and Satrup Moor and OchSenMoor an Dummer (Germany) all have the same design and concept as Holmegaard, according to Alrune, private correspondence].

He is the author of *Bue og Pil for 6000 Ar siden: Byg Din Egen Kopi* (Bow and Arrow from 6000 Years ago: Build Your Own Copy) (1991), a step-by-step book on how to build a copy of the Mesolithic bow from Tybrind Vig (in Danish). And he teaches bowmaking workshops at the prestigious Lejre Research Center in Denmark. In short, he's done his homework. And, as a Dane living in Denmark, he's one who should know.

I not only met with Alrune in Denmark several times, but I examined his bows, I shot his bows, we had dinner together, and best of all, we went roving over the hills and dales of Lejre together, testing our bows in the fields. I listened to his arguments about why the flat side of the Holmegaard must be the belly (study Alrune 1992 with care). He was able to demonstrate that not just the Holmegaard, but virtually each and every one of the other Mesolithic Danish bows followed the same rule, the old rule we all know and love—that the outside of the tree comprises the back of the bow (excepting a bow from Ringkloster with a gouged-out handle). It's when you have a small diameter sapling (2") or limb, such as the Holmegaard, that the bow looks as if it's backward.

So how did the misconception come about that the flat side was the back? Let me speculate. When the bow was originally excavated from the Holmegaard bog by Dr. C. J. Becker back in 1943 (see Becker 1945), he may have had Denmark's leading archer examine it and render an opinion. This archer would have been none other than Count Ahlefeldt, noted bowhunter, bowyer, author, etc. He had even been hunt-

ing in Africa long before Howard Hill (Hardy 1986:173-180). Now what kind of bows did they have in Denmark back in 1945? English longbows, of course. The ones that are flat on the back and round on the belly. Just as the Holmegaard appears if you turn it around backwards. Since this was what Ahlefeldt was used to seeing, naturally he "saw" the bow the same way he "saw" the English longbow. And so I say he, or whoever it was, interpreted the bow incorrectly. (Note that Becker himself disagreed and saw the flat side as the belly. Ibid).

The next question is "*does anyone else agree with Alrune or is he a lone wolf?*" During a long "midnight sun" evening spent at the Lejre Field Archery Range shooting with Denmark's Grand Master bowyer, E. Sigurd Hansen, we discussed the Holmegaard bow. Sigurd Hansen, by the way, is a world-class bowyer and author of a hot new book in Denmark, one of the nicest books of traditional archery ever published anywhere, a real masterpiece: *Langbuer og Pile af Trae* (Longbows and Wooden Arrows) (1992). Unfortunately, it is in Danish, but the profusion of photos and color plates would make it enjoyable to anyone. It is evident that this book is the culmination of a lifetime of meticulous precision bowmaking. I knew that Sigurd Hansen had examined the original Holmegaard bow in detail at the museum and was quite familiar with its characteristics. So what did he have to say about the Holmegaard bow? I put the question to him; the verdict: the flat side is the belly.

Another authority was questioned as well—no less than the renowned Professor C. J. Becker himself. In fact, when I was in the museum archives measuring and drawing the bow, in comes Dr. Becker, who took in my work at a glance and said, "*I see you're drawing my bow.*" A pleasant conversation followed, renewing acquaintances and discussing the problem with the bow. His Verdict? The flat side is the belly. Just as he said in his original article (1945).

So there you have it. The top authorities in Denmark today unanimously agree that the belly is the flat side. And they are in a better position

than I to know. Still, I decided to see if I could delve into and refute their hypothesis. So I examined both the original bow and the cast in detail. I did a tracing of the cast. (Because of the way the original is fastened down, a direct tracing is not feasible.) I measured bow and/or cast every 10 cm (about four inches) from the center of the grip outward (Figure 1). I checked the grain on the ends of the cast, where the bow had been broken over time. The bow was probably whole when deposited in the bog, ostensibly as an intentional offering but it was in four pieces when found. Another similar but larger bow was found at Holmegaard as well, but large sections are missing. Arrows were also found. (See photos of both bows and drawings of the arrows in Fischer 1985:7 and drawings of the bows in Rausing 1972: Fig. 9.) I noted, as Alrune had cautioned, that during restoration, so much filler had been added in the numerous cracks that one can never be quite sure of where reality is, though on the original, one can readily see what is wood and what is filler. In any event, I made my examination of the bow as it is now, right or wrong.

I noticed that there was no set (string follow) in the bow to guide me in my investigation. This may be because, during restoration decades ago, every little bend was straightened out as filler was added between the cracks. The original bow, when excavated, must have been as fragile as punk, though it

seems quite sturdy today. The original, preliminary (and only) report does not mention whether the newly excavated bow has a set or not.

I noted several other points of interest. For one, unlike my good friend and shooting companion, Flemming Alrune, I could detect no evidence of string grooves. Flemming had cut nocks into one end of his reconstruction, as Becker had postulated, but they are not on the original. Nor could I find any trace of an indentation to confirm which side was the back, although such is found on some other bows. I did note that about 2 cm had been broken off one end (not evidence of a "cylindrical horn" as Rausing claims (1967:40). Why 2 cm? Well, it's a guess, but here's how I went about it. I measured the width of the broken end at the break. (.79 cm) (Figure 1). I then determined the same point on the other limb. I discovered that 1.86 cm (OK, so it's not quite 2 cm) protruded beyond the .79 cm mark. If this is close to reality, then that means that the Holmegaard bow was originally not 154 cm (60.6") long as first published, but about 156 cm (61.4") and that the center of the bow was thus not in the center of the grip. More on this below.

The cross-section at the various breaks reveal that time has eroded the grain unequally. So whereas one can see no color change in the grain (the bow is uniform dark brown), one can see the raised, tight grain quite easily. This was indeed a small diameter stick (about 2" maximum). And the high-crowned, rounded side echoed the growth rings EXACTLY (Comstock's 1993 Figure 3, not Figure 2, though I disagree with his belly side.). The round side appears totally unmodified along its surface, except for the removal of the bark. According to Baker (letter to Alrune of 23 May '93), "*If the convex surface of the unbroken original Holmegaard artifact (is) the intact, underbark surface of the tree... then it seems, as you [Alrune] believe, more likely its flat surface is the belly.*" And his 1 Nov. '93 communication to me: "*This is airtight proof that it is not a backwards bow.*" He also adds (Ibid), "*A round belly will yield a larger set and would require a lot more wood to get the same weight*" as a bow flat on the belly.



All wood was removed from the flat face and the sides. What's most surprising is that the Holmegaard bow has the look of a modern bow if it's flat side is the belly. The constricted grip and self handle riser are not at all what you'd expect for the oldest known bow in the world. The oldest bow should be some simple bent stick with little or no tillering (see Baker 1992:82) but certainly no handle constriction. But then again, remember that this is the oldest KNOWN bow in the world, not the oldest bow ever made. It was certainly preceded by millennia of experimental efforts in order to reach such refinement by 9000 BP.

The Holmegaard has another unexpected twist which actually yields in part to modern mechanical explanation. Near mid-limb the width suddenly narrows while the thickness decreases less rapidly. The taper is not all that definite in one limb (thanks to "preservation" efforts?) but it's quite pronounced in the other. Please refer to Alrune's explanation for comparison (1992). Regardless of how this design quirk came about, the fact is that the CIRCUMFERENCE continues to decrease in about the same ratio below the step as above it. That is, no matter what you do to the width, it's the total circumference that effects the bend.

Be that as it may, the ends of the bow maintain their thickness well into the tips, despite the loss of width. This produces a narrower, thicker bow than expected at the ends. Baker has explained the mechanics of this phenomenon clearly enough (1992:63, 67). He adds (letter of 23 May '93): *"If the original was purposely narrowed, I believe this would have been only for the purpose of lowering limb mass where mass counts most. Performance can be raised to that of around a 10% higher draw weight bow by such narrowing."* I see the same relative increase in thickness at the tips on the several, original 1930 Walter Weber flat bows in my collection. The only difference is that these bows taper gradually in width whereas the Holmegaard does it abruptly.

Let's look at this phenomenon closer. Look at the cross-sections in Figure 1. Beyond the handle the flat side is the belly. But near the tip, the flat side seems to be the back. Actually, the top or back side is untouched throughout its length, except at the corners. Note that, starting at the mid-limb constriction, material starts being removed from the sides. Note the thickness measurements on the original, compute the total of width and thickness to see how, despite the constriction and relative thickening, the circumference gradually diminishes.

Once the sides were narrowed down, the belly corners were rounded off. This gives the far ends the appearance of a classic English longbow cross-section. That makes it look as if the cross-section has reversed itself from one end of the limb to the other. Whatever the reason, be sure to get this clear before you attempt your reconstruction. That is, cross-sections are equally as important as width and thickness measurements.

Is the Holmegaard a freak? Consider the fact that this same mid-limb shouldering is seen on many of the other Mesolithic bows, such as those from Tybrind Vig and Vedbaek (each about 6000 BP). It's a "style" that stayed in fashion for some 3000 years. That's a long time for a design quirk to stay in

more or less. Why not put the center in the middle? Because you can't shoot an arrow through the center of your hand. Shifting the grip down an inch puts the arrow closer to the true center of the bow than if you center the bow in the handle. You also equalize the stresses in the limbs a little better this way.

The Holmegaard has a grip area of 9 cm (3 1/2"). If the middle of the bow is toward either side of the center of the grip, as it is by 1.8 cm (3/4"), then it stands to reason that that end is probably the top. (See figure 1) Thus I postulate that the limb with the broken tip is the top limb.

Was the Holmegaard sinew-backed? Alrune says an emphatic "no" (1992); Hansen an emphatic "yes." My own feeling is an emphatic "no." Why? Because in addition to the lack of confirming evidence, sinew backing is rarely found in climates of high humidity and abundant rainfall. Western

Europe has both. But a more compelling reason is that sinew is not necessary. All the true replicas I know of function fine without it. (Alrune's 60 lb reconstruction

cast a 500-grain 160 fps, a very respectable speed for any bow, backed or not. Personal communication 22 Nov '93.)

By the way, the original bow was made from an immaculate stave. There are no knots or lumps on it as there are on my stave. The original bowyer was more choosy than we.

How could savages of 9000 years ago have known these factors and mechanics? Because, savage as they may have been, they were not dumb; they were as smart as we are.



Holmegaard
Riser

...you should aim for a functional reconstruction, not a strict replica—unless it is just to sit on a museum wall.

style if it didn't work. As the saying goes, *"If it isn't broken don't fix it."*

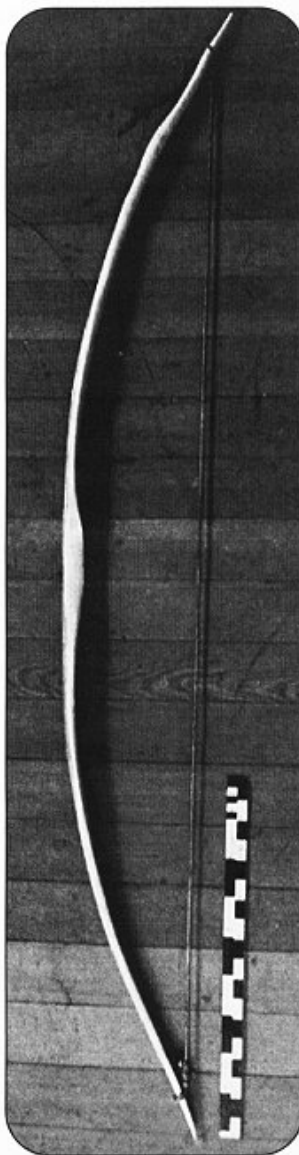
As noted above, my examination, with the adding in of the missing tip, disclosed that the center of the grip is not in the center of the bow, that the center is 1.9 cm (3/4") above center. To me this was a clue as to which limb was the top and which the bottom. Tradition of long standing has it that on our English longbows and American flat bows with 4" grips, the center of the bow should lie about 1" below the top of the grip (Duff 1927: 46). So it is with the Holmegaard,

THE RECONSTRUCTION

Anyway, after all this examining and cross-examining, I decided I had to make a copy of the bow to test out my theories. Alrune kindly gave me a 3" diameter Danish elm stave (I should have used a 1 3/4" to 2" stave to match the original more accurately.) I split the trunk, roughed out one of the two staves with an axe, and finished it up with bow scraper, rasp, and cabinet scraper (Figures 1 - 6). I made no pretense at using primitive tools as that was not part of my research design. I was able to match the width measurement of the original to within a few millimeters, except where here and there I had to take off more wood to get the correct bend. As I've said many times and as Alrune exhorts (1992), one must not loose the bow in making a replica. That is, if you copy the measurements on one piece of wood exactly on another piece of wood, you might indeed have a "replica," but don't expect a functional bow, or at least one which matches the original. Nevertheless, I strongly suggest using the measurements as rough guides, perhaps even following them exactly in width and at the handle, but varying them in depth in order to get a proper tiller, a proper bend. That is, you should aim for a functional reconstruction, not a strict replica—unless it is just to sit on a museum wall. On the other hand, you can't just make up you own measurements and call your bow a copy. You must use the original measurements as the starting point.

My bow was .4 to .6 cm thinner than the original at mid-limb. Since my bow pulls 48 lb at 24", I would estimate that the original Holmegaard bow may have been between 60 - 65 lb. Mine is a harsh shooting bow with plenty of snap. It stacks up a good bit after about 24", which is just what I'd expect from so short a bow (Figures 5 and 6). Who says they pulled 28"? (The bow may require a full 28" draw to obtain maximum cast.) Still, all-in-all, it's a highly functional bow.

I can't stress enough the importance of selecting a piece of wood of the same diameter as the original in doing a reconstruction. I must admit the stave I had was a bit too broad for a perfect



replica. Because the Holmegaard bow was made from so small a sapling, the back has to be quite rounded in order for the copy to duplicate the original. This should result in a belly which is quite flat, with a sharp angle at the edges. BUT, note how the cross-section changes as you work your way out the limbs) Figure 1).

When I went to string up my bow, I was confronted with the problem of how to make the string stay on a tapered tip with no notches. I know the traditional wraps and hitches; I've watched Bert Grayson loop the string over such a tip in the blink of an eye. But still I sought for another solution that was spinning around in the back of my mind. Then it hit me. Do the same as I do with my usual Flemish linen strings. Put a

loop at the top—a tiny loop that would slip down only an inch or so (where the string stops is a guess, but judgement comes with experience). And on the bottom tie the usual bowyer's knot, again with a tiny loop. I twisted up such a string and, after a number of trials, had my bowstring to size.

I shot it and found that the loop and knot stayed right where they were supposed to stay. And the bow needed no wrapped shoulder (Baker 1992:238, 239, Comstock 1993:96; Callahan 1989.)

A single looped strand of a second cord connected the upper loop to the tip and served as my "string keeper." This allowed me to keep the string against the bow when it was unstrung instead of having the string flop all over. (See the Eskimo bow in Callahan 1991:48 for a similar solution.) We don't know how the Holmegaard bowyer did it, but this is one of numerous possibilities. The interesting thing about this method is that you get the same fistmele every time and nothing is left to chance, as it is with a new wrapping each time.

For those who would like a closer look at the original Holmegaard bow, but who can't arrange an afternoon trip to Copenhagen, may I suggest purchasing a plastic cast? The museum usually only makes up casts for other museums, but the conservator, Peter Henrichsen, told me he would consider a few private orders. Expect to wait up to 6 to 9 months and to pay 2000 Danish kroner (about \$280). The cost might be less if you don't want the color matched exactly. (Contact Peter at Nationalmuseet, Bevaringsafdelingen, Prinsens Palace, Fredriksholms Kanal, DK-1220 Copenhagen K, Denmark.)

SO WHAT DOES THAT PROVE?

It's one thing to say that Alrune or Callahan are pretty sure the Holmegaard (and other Mesolithic bows) is not a backward bow. It's one thing to demonstrate this with accurate models which function.

We must have more to go on. It would be nice if we had "proof", but if we can't have proof, all we have to go on is probability.

The set of a self wood bow is usually a dead giveaway as to which side is the back. But the Holmegaard

was restored and mounted so flatly that no set is detectable.

Consider the fact that no wood has been removed from the convex side of the bow. Held flat side in, the bow looks absolutely "normal," while if the flat side is out, the bow, to our way of thinking, looks backwards in every way, with handle riser protruding out the back of the bow. It's not just odd to our way of looking, it just doesn't make functional sense.

Recent "backward" replicas by Baker and Comstock bear this out, taking approximately twice the set of "forward" bows identical in every other respect. And with performance falling to about that of a 7 lb lighter bow. No one with the acumen of the Holmegaard bowyer would produce such a limp weapon.

All evidence indicates the Holmegaard was not a backward bow. My neck is stuck out. Anyone who's tempted to take a whack, help yourself. But just be sure you've taken the trouble of going down through those seven locked doors to the basement of the National Museum—or at least scrutinize the cast—before you wind up and take that swing. There's just no substitute for examining the original artifact in person.



Thanks are due to those who helped me in this research. Without their help I couldn't have done it. Special thanks are due to those who reviewed and commented upon earlier drafts of this manuscript—Flemming Alrune, Tim Baker, Erik Sigurd Hansen, and Paul Comstock. I incorporated their suggestions as I saw fit. Thank to Dr. Poul-Otto Nielsen and Peter Henrichsen of the Danish National Museum for allowing me to examine and handle the original artifact and plastic cast thereof. And special thanks to Dr. C. J. Becker, excavator of the Holmegaard bow, for encouraging this study. I, however, take full blame for the heretical statements made herein.

REFERENCES

Alrune, Flemming: 1991 *Bue og Pil for 6000 Ar Siden: Byg din egen kopi* (Bow and

arrow from 6000 years ago: Build your own copy.) Lejre Research Center, DK 4320 Lejre, Denmark.

1992 A Mesolithic Elm Bow Approximately 9000 years old. In *Journal of the Society of Archer-Antiquaries*. 35: 47-50

Baker, Tim: 1992 Bow Design and Performance. *The Traditional Bowyer's Bible, Vol I*: 43 - 116. Bois D'Arc Press.

Baker, Tim: 1994 Bows of the World. *The Traditional Bowyer's Bible, Vol III*: 44 - 48. Bois D'Arc Press.

Becker, C. J.: 1945 *En 8000-Aarig stenalder boplads i Holmegaards mose*. Forelobig Meddelelse. Fra National Museets Arbejdsmark 1945. Copenhagen, Denmark.

1991 Archery in the Arctic. *Bulletin of Primitive Technology* 1:35 - 38 and 2: 47 - 53. Society of Primitive Technology.

Comstock, Paul: 1988 *The Bent Stick: making and using wooden hunting bows*. Comstock, Delaware OH.

1993 Ancient European Bows. *Traditional Bowyer's Bible, Vol II*: 81 - 112. Bois D'Arc Press.

Duff, James: 1927 *Bows and Arrows*. Macmillan.

Fischer, Anders: 1985 *Pa jagt med stenalder-vaben* (Hunting with stone age weapons). Forsog med fortiden 3. Lejre Research Center, Denmark.

Hardy, Thomas: 1986 *Longbow: a social and military history*. Mary Rose Trust. Portsmouth, England.

Rausing, Gad: 1967 *The Bow*. Gleerups Press, Lund, Sweden.

Sigurd Hansen, Erik: 1992 *Langbuer of Pile af Trae* (Longbows and Wooden Arrows). Bogan Press, Lyngbe, Denmark.

Errett Callahan is a bowmaker of over 50 years experience. He teaches wooden bow-making during his workshops in traditional archery held every May. He is the author of numerous articles on traditional archery, flintknapping, and primitive technology. He has an MFA in Fine Arts, A Ph.D. in archeology, and is the Founder and President of the Board of the Society of Primitive Technology. His favorite form of archery nowadays is roving. He "never has and never will shoot a compound bow." He may be reached at 2 Fredonia Ave, Lynchburg, VA 24503.

BOWHUNT ALASKA!

Jerry Ramshaw & 60" bull moose taken with an osage self bow.

MOOSE JOHN OUTFITTERS
 Jay Massey
 Registered Guide/Outfitter
 P.O. Box 429, Girdwood, AK
 (907) 783-2129

Red Mulberry, Its characteristics and application in Wood Bowery

by
Murray Gaskins

Now that I've got your attention, let me explain what I'm talking about. I am very much aware that Osage and Yew are the best known traditional bow woods. Some of us however, simply don't have much access to these historically and admittedly great bow woods. Finding straight, clear Yew or finding straight and clear Osage is almost out of the question. It can be done, but the terms straight and clear are almost mutually exclusive when related to either of the afore mentioned bowyer's gifts. Now, after some of us do our apprenticeship on the straight and easy white wood way, we go looking for character wood and generally have relatively little trouble finding it. If I told you that you could have your cake and eat it too, even if you don't agree unconditionally, you may be able to see my point.



The Mulberry is in my opinion much under utilized as a bow wood. It is a first cousin of Osage Orange and has been widely transplanted across the United States. I was amazed at how much of it I saw recently on a trip to Kentucky. The original trees had been planted in rows, apparently as wind breaks between buildings near freeways. Mulberry grows

very rapidly so when the fruit was eaten by birds or had washed into nearby ditches and creeks the dominant species there was, you guessed it, the subject of this article. In most instances when Mulberry escapes cultivation and grows wild it grows so rapidly that it often quickly becomes the only plant growing in the area. It efficiently shades out all

competition with its broad leaves. This tree has a tremendous appetite for nitrogen and water. Drainage ditches are the most natural place for such a plant to move in with its predisposition for consuming large quantities of water and nutrients. Given these conditions Mulberry will colonize, overpower the competition, and prosper. If you have such a place nearby go look for bow wood. In this situation you will find straight trees with thick growth rings. Friends, I'm not talking about an annual ring that's an eighth of an inch in thickness, it's not unusual to find half inch or thicker rings on trees that are from eight inches up to approximately a foot in diameter. On one site which I had the occasion to do a wetlands delineation, the Mulberry had overgrown everything except the Osage with which it was mixed on the higher portions of the site. At first glance it was hard to tell the two apart. The bark and leaves of these two species are very similar in color, texture, and pattern. They both have a white milky sap, which pours out when the bark is injured. The sap is rough on chain saws and really hard to get out of clothes, so don't wear your new blue jeans when you go to cut one of these trees.

As a bow wood, I place Mulberry on the same plane with the rest of the premium species, for several reasons. For one it works with tools much the same as Osage. At this point I'll tell you that on the average Mulberry is not quite as dense as the run of the mill piece of Osage. I find more variation between individual trees within either species than the average difference between the two species themselves. Location of the tree and the conditions it has had to contend with have much to do with the texture of the wood. The wood generally seems to be a little lighter in weight than Osage. It shares the bendability of Osage when using steam and or heat but for a bowyer jaded from too many confrontations with paper thin rings, here is an alternative. I have seen quite a few bows with a fixed handle built from three growth rings. You can find Mulberry with thin rings too. Just cut a mature tree, away from a choice growth site and the outer growth rings can be twelve or many more to the inch. That's

still very workable in my book. As the tree matures, some grow over 30 inches in diameter, the wood will become progressively more dense in the outer one half of the wood, the rings will be tighter also.

Mulberry will frequently have a much thicker sapwood than Osage will. Sometimes the sapwood will be up to one and a quarter inches in depth before it turns to the yellow brown heart wood. The heart wood is as beautiful as any bow wood we will ever use, in my opinion. It has the same basic yellow color as Osage and has the same depth, when finished. It also oxidizes in the same manner as Osage, when exposed to sunlight. Mulberry seems to be just a little more brown than Osage is after exposure to sunlight.

I build many of my Mulberry bows by removing the sapwood the day I cut the tree. Don't just remove the bark to the sap wood and then leave it exposed to the air. If you do, your bow stave will crack all the way to the heart and may be ruined. I rough out the bow, then reflex it over a form about two to three inches. Working good freshly cut wood is the way to go in my experience. If you want to go on and get a durable bow built quickly, this is the way. It's not the way passed down traditionally but try it sometime if you need a pleasant surprise. The character of any wood you don't work up right away will change rapidly as the moisture level drops. There probably are some woods which can't be worked soaking wet but I am still looking for one. Anyway, I then dry the bow on the form until it is at approximately seven or eight per cent moisture level. If you dry Mulberry in this manner you had better secure it to the form, other wise you may have a bow that looks like a snake climbing up a hogwire fence. (That's pretty crooked and twisted up if you've not seen that, by the way.) By doing any bending with heat at this point while the wood is saturated, then securing it to a jig, you can save a step later. The job of straightening will be easier at this point if it's required at all.

Mulberry is a confidence builder for those of us who are not yet accustomed to following a single ring on a stave's back. I was shown a piece of Osage before I ever knew a bow could be

built from Mulberry, shortly after I built my first Hickory self bow. My reaction was about like the one you have seen when a new vegetable is sprung on a kid at dinner time. I absolutely could not believe that you followed one ring the whole way from end to end. That wood sat there while I built several more hickory bows. I was intimidated, stalled, and stuck between the gears. From time to time I remember picking up that piece of Oklahoma Osage, looking at it and then putting it back down after scratching on it, in less than a totally committed fashion, I might add.

One day at the library I ran onto a copy of *The Adventurous Bowmen*. After reading it awhile I saw where Mulberry was used and was rated highly as a bow wood. As luck would have it, on the way home a day or so later, I saw a line crew about to cut what turned out to be about a 14 inch diameter Mulberry down. The tree had grown up in a fence, under, through, and in a power line. It had probably been planted there by a bird. I asked if I could have the tree, the boss gave me permission on the spot. The crew topped it and left the first fifteen feet of trunk standing, then left. I raced home, came back with my saw and cut that tree down before dark. It split with about half the effort of Hickory. Not too long after that there were several nice bows built in various styles and they're still being shot today. I've shot tournaments with them and killed several deer with them too. From my experience with this wood, the boys in that book were sure right.

Mulberry is lighter than Osage, therefore if you're using a similar design to an Osage bow the one made of Mulberry will have substantially less hand shock. I've built Mulberry bows in many different designs and not yet had a failure with this wood. This is in part because any pins and imperfections are well supported by the thick growth rings. It's been my experience that Mulberry will let you get by with more than Osage in the area of not having to raise the knots which you encounter. This wood can often be just as snarly, knotty, and have as much character and performance as any Osage you've ever seen or worked with.



KEEPING WARM

by Paul Rodgers

On January 1, 1996, I found myself in the high desert west of Arizona's Date Mountains beginning a week-long primitive javelina hunt.

My companions were mostly from the San Francisco Archery Club. That evening, as the sun set and the temperature plummeted, someone started a huge bonfire in a shallow pit ringed with rocks. Everyone sat around the fire and shared in the warmth and camaraderie before retiring for the night. The temperature reached a chilly 23 degrees that night. And even though I had a goose-down filled mummy bag, I was less than cozy. I thought I should come up with a better system of keeping warm and sleeping soundly.

The next night it came to me as I knelt around the fire to reposition a log—those rocks making up the fire ring were quite large and hot. Before bedtime I got a flannel sheet I had brought along as a bag liner. I pulled a large, rather flat, 10-pound stone from the fire ring and wrapped it in the the sheet. This I placed inside my sleeping bag down near my feet, and after taking care of some routine evening camp chores, I climbed into bed. I couldn't believe it. Much more warmth than I expected was radiating from the rock. And it wasn't much in the way of my feet. Just a warm soft lump down there that enabled me to sleep all night long in comfort.

The next morning, when I took my rock back to the camp fire to unwrap and return it to the fire ring, I received some good-natured ribbing from a couple of the guys. One of them really raised his eyebrows when I told

him to feel the rock. It was still warm after almost 10 hours away from the fire.

The guys continued to kid me about my nightly ritual with my rock. "You named that rock yet, Paul?" asked Joe. "Louise" was all I said. "Don't for-

get Louise," was often heard at night. "Watch out for Louise," when someone was stumbling around the evening campfire. Still, I feel I got the last laugh when it came to keeping warm.

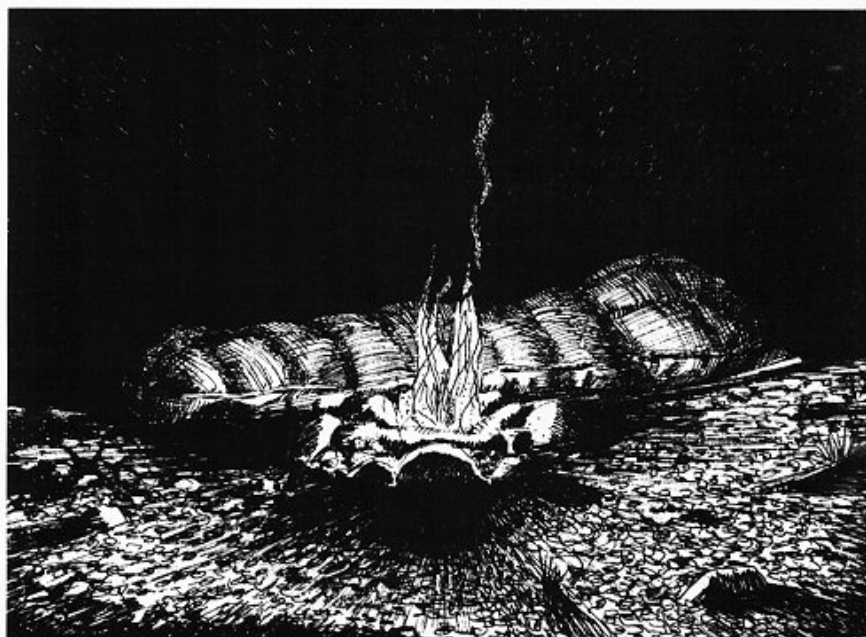


Illustration by Robert V. Martin

RIBTEK BROADHEADS



123 Grains
1 1/16" W
11/32" Ferrule

125 Grains
1 1/14" W
11/32" Ferrule



See your dealer, call or write:
HUNTER DISTRIBUTING

1232 Redman Blvd.

St. Louis, MO 63138

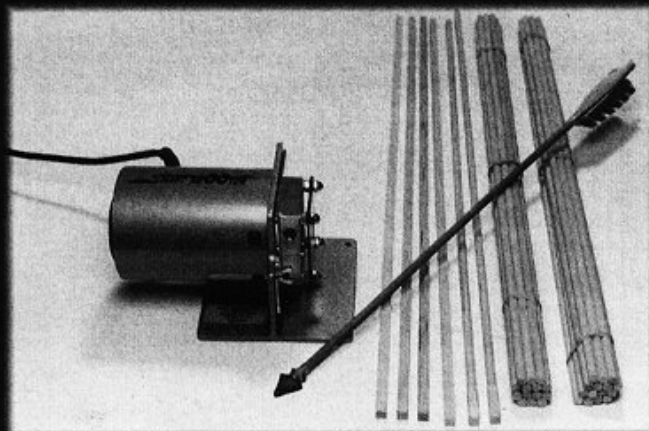
Tel./Fax (314) 355-8829

Under \$24 a dozen plus s&h
(suggested mfg. price).

MO residents add 5.925% sales tax.

Dealer inquiries welcome.

PRODUCT



The Shaft Shooter

Designed for simplicity and economy of design, with a machinist's attention to detail and quality, the SHAFT SHOOTER is an affordable, first-rate doweling machine.

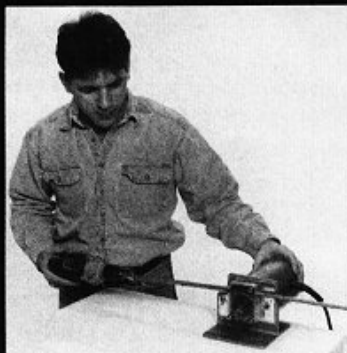
Select the wood you want (hickory, maple, ash, fir, pine, etc.) to make shafts from, cut it into 3/8" square stock on a table or band saw, slip one end of the square stock into the special drill adapter supplied with the SHAFT SHOOTER, and you are ready to make a premium, exceptionally smooth finished shaft.

With the SHAFT SHOOTER's 3/4 horse motor and special carbide cutter turning at 29,000 rpm's, you guide the square stock through the unit while your electric drill turns the shaft at around 600 rpm's. In about 45 seconds you will be looking at a first class arrow shaft. The SHAFT SHOOTER is factory set to produce 23/64" shafts, but can be adjusted to 11/32". A 5/16" attachment is also available.

When you are finished working, simply unclamp the machine and hang it out of the way on the wall until you need to use it again. As their information packet says, *"If you're a roll-your-own enthusiast, you want to experiment with other shaft materials, or just like saving money, then the SHAFT SHOOTER is for you."*

For a brochure and pricing information, call or write to:

SHAFT SHOOTER MFG.
Brad and Gerry Harden
Route 1, Box 701B
Raymond, WA 98577
(360) 942-6155



(If you enjoy the superior flight of tapered shafts, look for the new SHAFT SHOOTER 10" taper machine coming out soon.)

WILDWOOD ARCHERY

Wildwood longbows and flatbows are backed with flame-tempered, reflexed Japanese bamboo. In most cases the shell is removed, leaving the power fibers exposed. Occasionally, the bamboo is left in its natural state to display the character of certain staves, i.e. water spots and unusual markings (natural camouflage).

The belly is constructed of traditional bow materials and exotic hardwoods (yew, osage, black locust, and bamboo) tapered and laminated together. This creates a bow of superior cast and durability, many times rivaling the performance of modern fiberglass straight-limbed bows. They are guaranteed for one year against all workmanship defects.

Handle and tip overlay materials can match the lamination colors, or if you choose, can be made of more exotic materials, such as antler and horn (whitetail and mule deer, moose, caribou, antelope, or bison).

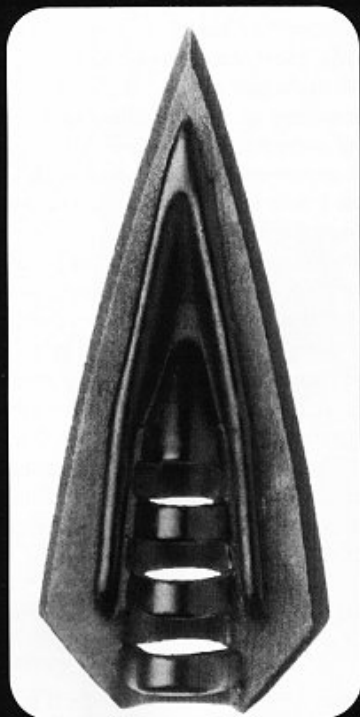
Wildwood bows are not considered just tools for hunting, they are also works of art. Therefore each bow is painstakingly tillered and finished to an unequalled level of quality. For more information, contact:

WILDWOOD ARCHERY

Daryl C. Forslund
PO BOX 52, Hamilton, MT 59840
(406) 363-1714



SPOTLIGHT



RIBTEK'S NEW DESIGN

Hunter Distributing presents a new look and a new size, in addition to the original RIBTEK broadhead.

This new look stems from a new improved design of the RIBTEK's trademarked internal skeleton. It makes an unbelievably strong head even stronger. RIBTEK broadheads will not windplane.

From alligators to zebras, Australia's number-one selling head will take it for you! Concrete block—that's concrete, not cinder block—testing with a 100 pound longbow has proven the new design to be able to take maximum hunting abuse, shake it off, and still be ready to harvest that trophy of a lifetime.

These new heads are 1 1/4" wide by 2 3/8" long. They feature an extended 11/32" ferrule that takes everything from a 5/16" to a 23/64" shaft, and centers the head when it is mounted. With strength gained from the internal skeleton, and not mere hardening, the rockwell hardness has been reduced to 45. That translates to easier sharpening. This all-new head has a weight of 125 grains. With the use of a recommended long adapter for aluminum arrows, the head weight is brought to approximately 150 grains.

When it comes to strength, reliability, sharpening ease, and versatility, the RIBTEK has it all.

For more information, contact:

Hunter Distributing
1232 Redman Blvd.
St. Louis, MO 63138
(314) 355-8829

CLASSIFIED ADS

The **BENT STICK** Manual can help you build wooden hunting bows. Send \$11.00 to P.O. Box 1102, Delaware, OH 43015.

"STRICTLY NATIVE" Reproductions of Native American archery tackle. Bows, arrows, quivers, stone knives, brain-tanned leather, bow staves, classes, horn bows. Over twenty years experience. Send \$1.00 to: D.M. Kissinger, RR #2 Box 2493, Berwick, PA 18603.

TWIG ARCHERY. Raw shafting, pre-finished shafts, finished arrows. Cedar, pine, maple, "pass-through" hardwoods, and all new CHUNDOO. Parallel, custom tapered, barreled shafts. Arrow-building supplies. Tanned snakeskins, only \$12 - \$15, very nice!! Beautiful, hand-laced, leather quivers and accessories. Free brochure. **TWIG ARCHERY**, 45194 TR 432, Conesville, OH 43811. (614) 829-2847, Monday-Friday 4-8:30 p.m., Saturday 9-5 p.m.

ARROWS MADE YOUR WAY. Many options and woods. We seek perfection. Send long SASE for prices. Bowhunter's Dream Archery, Box 4163, Washington, PA 15301.

Premium Port Orford **CEDAR SHAFTS AND CUSTOM ARROWS.** Stotler custom TD bows, call Bob at **ANTELOPE TRADITIONAL ARCHERY** - (510) 680-7219.

LOOKING FOR LOST BOWYER (JOHN MAUS). I have one of his bows and would like to locate him. If you know where he is, please call Lyle Goodall at (605) 853-2437.

CLASSIFIED AD RATE:
\$1.00 PER WORD,
\$20.00 MINIMUM.

USED BOW ADS: \$10.00.
ONE BOW PER AD,
20 WORD MAXIMUM.



THE COMPETITIVE EDGE: *Something About Bows*

By Gary Sentman

As I sit watching the sunset from my living room window, my memory goes back to all the different bows I've used throughout the years. In the 1970s I did a lot of shooting with recurves and longbows because the 28-target field round was very popular. We shot four arrows at each of the 28 targets. Because of this, the average shooter pulling a 60 to 75 pound longbow would fatigue too quickly to shoot a winning score. But a recurve permitted an archer to use a bow of 55 to 60 pound pull. Therefore the score was better because the shooter didn't tire as readily. Through the years I have seen the recurve evolve to the point of perfection. On the other hand, many longbows remain basically as they were in the early 19th century (with the exception of those using fiberglass). Let's take a look at the design of each bow.

The modern recurve is the bow of choice in Olympic and serious target archery. A good target recurve is approximately 64 to 68 inches long so it won't pinch the fingers, therefore providing a smoother release. The limbs are quite wide with a short working limb. This allows for more physical weight in the riser and stiffens the limbs for stability and speed. I have

found these bows to be very accurate under slow, deliberate shooting conditions. To maintain a degree of accuracy and stability in a shorter recurve designed for hunting, it is important to increase the brace height or increase the reflex of the bow. This is why, I feel, the recurve bow performs better with a lighter physical weight arrow. With the increased brace height the arrow stays on the string less time. Therefore the transmission of energy into the arrow is less. As a general rule, from my experience, the recreational shooter will find the recurve bow a little easier to shoot than the longbow.

When comparing the longbow we see that it has a very short riser section with long working limbs. Simplicity of design makes it a very rugged bow. With the advent of epoxy glues and fiberglass, we now see longbows that are made with a reflex/deflex design, enabling the limbs to be stressed to a point where they approach recurve bows for arrow speed.

Let's look at the needs of the modern archer for bow selection. Obviously if one wants to enter Olympic competition, the selection would be a recurve bow, upon which many apparatuses could be attached to help stabilize the bow for target accuracy. A selection of a more basic longbow or recurve would be in order if one's needs are for field shooting and hunting.

Some basic physical aspects to consider when selecting a bow are as follows:

- The heavier the object, the harder it is to move.
- Less movement = less margin of error.
- Longer = less finger pinch.
- Generally, the more a limb is stressed, the greater the arrow speed.

In bowling, golf, tennis, etc., you will find that each athlete will choose different equipment to suit his or her style and technique. The same is true when choosing a bow. Decide if you will be spending long hours shooting slowly and deliberate, or possibly fast and accurate in a split second. A person who lives in the eastern United States and shoots primarily from a treestand would possibly consider the convenience of a shorter bow more important than long-distance precision accuracy. The person might consider a recurve of 60 to 64 inches in length, and 45 to 60 pounds of pullweight. On the



VALLEY
TRADITIONAL
ARCHERY SUPPLY

Home of the
Thunder Mountain Flatbow

Full-time Full-line traditional

3814 Blair Road
Whitewater, CO 81527
(970) 243-8144

MC/Visa

Catalog \$2 (refunded with first order)



other hand, a bowhunter in the Western United States may be required to shoot longer distances. Therefore, accuracy and trajectory become more important. A bow of 62 to 66 inches and 55 to 65 pounds pullweight for flatter trajectory would be in order.

While living in Alaska and hunting with the longbow, I found that a bow must be very rugged. I would find myself in a bear patch of brush and devil club or hanging from rimrock, with bow in hand. I admit my temper would sometimes get the best of me. When my bow would catch on limbs and brush I would just jerk it loose (I have seen recurves come unstrung at the slightest pull). When forging a river I have slung my bow to the opposite bank to have it land softly in the brush or weeds.

For me, a longbow is more dependably accurate for getting off fast shots, as it was the time Merle Kenneston and I were hunting black bear in Alaska and one came for me. I put three arrows in the bruin in approximately nine seconds, dumping him only ten feet away from me. Had I been using a bow with less limb stability, my arrows may not have struck the vitals of the bear. By the way, at the time, neither of us were packing firearms. Merle was only packing a movie camera trying to get pictures of the bear as I stalked it.

In situations like the bear hunt, I feel that the longbow is a more rugged

bow. Under adverse conditions the limb of a longbow may be less apt to twist or fracture.

What about speed? A bow that is fast is a bow that is stressed.

A bow that is stressed to give the ultimate speed is a bow that is inclined to be noisy and may exaggerate the shooter's slightest error. The less options the shooter has to do something wrong, the more consistent in performance he will become. Therefore the more accuracy he will achieve. The speed of the arrow is very important, but not important enough that one should give up durability or accuracy if one is looking for a true hunting bow. I have found "Murphy's Law" of "Whatever can go wrong, will go wrong" to be true when conditions are such that it pushes the archer and his equipment to the limit.

Whatever bow one decides on, I feel that the working limb should work at least 1 1/2" to 2" into the fadeout of the riser. Thus eliminating a hinge in this very critical area. A bow, whether used for targets or for hunting, is accurate when it is consistent in performance. Look for durability which will give more accuracy under adverse conditions such as weather, poor release, fast shooting, etc. You can test the stability of a bow limb by holding a bow by the tip at arm's length. If the limb bends like a wet noodle or is "rubber-bandy," the limb is not

stable. Also, you can hold the bow's riser in your left hand with the limb skyward and strum the string at the tip of the limb. If the limb continues to vibrate and flex for several seconds as the nocking point on the string flexes from left to right, then the bow lacks limb stability. This would probably be due to very wide limbs with little core thickness. This bow would draw very smoothly, but if you had to shoot an arrow quickly with it under unorthodox conditions it would have a tendency to exaggerate your slightest error.

In my opinion, (1) the less limb travel, the less margin for error; and (2) a grip that promotes consistency is a must under any conditions.

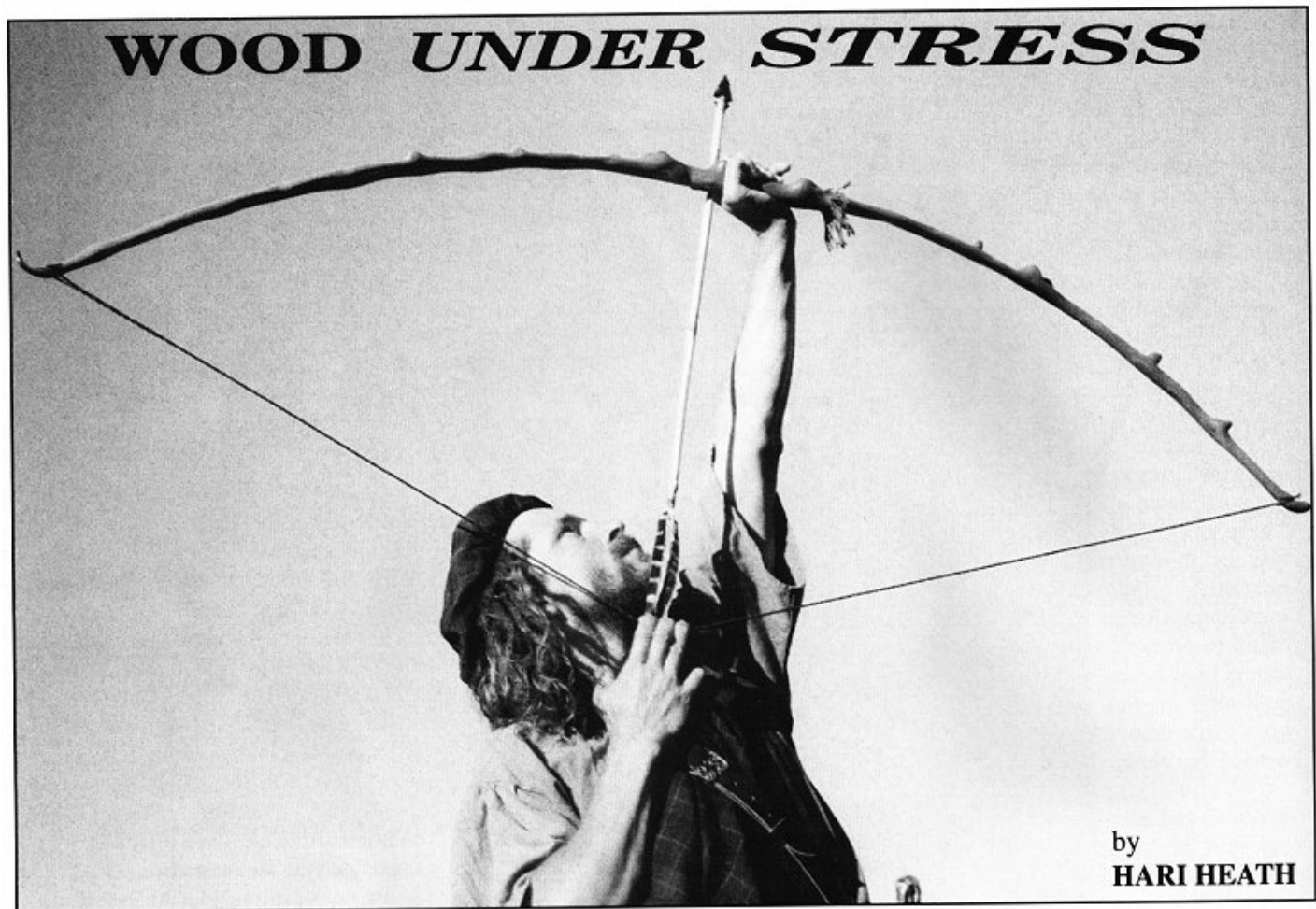
I consider a bow stable when it benefits the shooter. Avoid bows that are excessively rough in the hand or that compress rapidly as the arrow is drawn (commonly referred to as stacking).

Whatever bow you decide on, you should first look at your objective. Consider your style of shooting and what you expect to achieve. From my experience, don't look for magic or miracles. Consider the physics and the way the bow is built. Put it all together and hopefully you will achieve your goals.

GOOD SHOOTING!



During the last thirty years, Gary Sentman has bowhunted from Alaska to South America and Australia. In 1975 he set the world record for pulling the heaviest handheld bow, pulling an amazing 176 pounds at 28 1/4" as recorded in the *Guinness Book of World Records*. Gary currently resides in Drain, Oregon, where he manufactures Sentman Longbows.



WOOD UNDER STRESS

by
HARI HEATH

(An updated version of an article first appearing in *The Bulletin of Primitive Technology*, Spring, 1995: No. 9.)

Few things are at once so simple and yet so complex as the bow. This graceful bend of wood pulled by a string has been used to bring home food, defend against enemies, or conquer new territories for millennia. Humankind has been shaped by the results of this simple weapon. With passionate inquisitiveness, the archers of antiquity delved into the mystery of wooden springs that fling things.

What is the design principle that makes bows work? what happens inside the wood while it is "working?" What has been tried from ancient times to present? How can we make a bow shoot faster without breaking?

Wooden archery is best understood by understanding the rules that allow it to work. Like most rules, there are many exceptions, but generally the rules hold true. Bows work because stress is applied to the wood via the string. The key to success is understanding stress and the material's ability to handle it (stress management).

Wood is a complex structure that comes from trees. The diversity of the many species and individual examples of each, *especially in relation to the successful application of stress*, is an immense subject. Available sun, water, and climactic conditions, as well as harvest and seasoning processes can greatly affect the individual bowstave. But, there remains amongst this diversity some common threads.

Wood is a cellular composition of fiber structures commonly referred to as grain. The grain occurs in several forms on the tree. Vertical grain fibers run up and down the trunk of the tree in each annular grain. Annular grain is produced each year (in temperate climates) over the previous year's annular grain. It should be noted that the only "living" parts of the tree are the leaves or needles and the inner bark which grows new "wood" each spring until dormancy in the winter. The wood and bark of the tree are essentially "dead," like your own hair and fingernails. A tree must withstand the forces of nature, especially when coping with a lifetime of wind, which requires flexibility through repetitive tension and compression cycles (the ideal qualities of a bow).

When a bow is unstrung (and assuming it is straight) the length of the back (the part facing the intended target) would be the same as the length of the belly (the part facing the archer). When the bow is strung and pulled, the back becomes longer (tension) and the belly becomes shorter (compression). Somewhere between the two forces lies the neutral plane (see figure 1).

The ability of the wood to successfully handle the applied stress of tension and compression and perform efficiently depends on the ability of the bowyer to understand and work with the available grain structure as close as possible to the limit of elasticity of the material used, and to arrange the

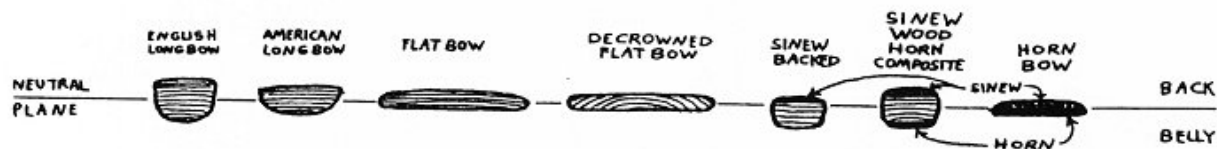


Figure 1. Mid-limb cross-sections of different bow designs.

configuration of the weapon so it will have the least amount of moving mass upon release of the string. That often means compromise.

While stress on wood is the main subject of this article, it is important to understand that the moving mass of the bow limbs affects the efficiency of the bow. Efficiency in this case is defined as the amount of energy transferred to the arrow relative to the amount of energy applied to the bow. How much mass, how far it has to move, the radial distance from the mass to the pivot point (the bow handle), whether it is "working" mass or just going along for the ride, are important considerations in the design process.

Let's add one concept and then dissect a few examples from archery's long history. I call it the 2X8 rule. When making a bow, if you add twice the width you get twice the strength. But if you add twice the depth you get eight times the strength. Obviously by adding twice the width you'll double the bow's strength, but how does deepening the bow add so much? It does so by placing the tension/compression forces farther apart.

For a first example, let's look at the English longbow. This design existed long before there was an England, but since the English refined it, popularized it, and built a nation with its military results, I'll let them claim the design as their own. The English long-

bow is a weapon with a narrow width and a deep, rounded belly. To handle the stresses imposed by this cross-section design, it must necessarily be made from highly stress-resistant wood, and it must be long. Especially if it is to be a 100 to 125 pound war bow pulled to 30" or more of draw.

The compromises necessary to pull off this design may not result in a net benefit. Getting strength from increased depth instead of width reduces cast-robbing mass, but because the tension/compression forces are farther apart, the arc of the bow will be more gradual and therefore longer, which increases cast-robbing mass. The rounded belly design also concentrates wood stress in the center of the belly.

While there are some negative aspects of this design, there are also some positive ones. If constructed in the classic D-tillered style, all parts from the handle to the tips are "working wood" and contribute to the cast of the arrow.

During the first half of this century, American target archers popularized the American longbow, a design similar to the English longbow. It retained the flat-backed, round belly cross section, the overall length, and often the horn nocks of the English longbow, but had a wider, shallower cross section. This design was halfway between the longbow and the flatbow.

Perhaps the best design for a durable, efficient, high-performance wooden bow is the flatbow. Historically, it was found on both sides of the Atlantic and has a known history of over 8,000 years (Comstock, *Traditional Bowyers Bible, Volume II*). Its durability comes from the "wider is stronger" theory, keeping the tension/compression forces close together. This allows a more radical bending arc and a shorter limb length for a more efficient cast.

To optimize performance of the flatbow, a rectangular cross-section limb design is often used. This causes an even stress or "work" across the full width of the limb. This can be achieved by selecting a stave from a large diameter log or by decrowning. Decrowning is a careful process of removing the crown from the back of the bow while keeping the annular grain running longitudinally on the back of the bow.

The minus side of the flatbow design is that when you double the width to double the strength, you also double the mass. In other words, instead of adding a little depth for a small gain in limb mass, you add a lot of width for a large gain of limb mass. This can be compensated for by flaring out to a flatbow design at mid limb and flaring back to a narrow, deep tip.

Another technique used to manage stress is to apply other materials which have greater elasticity than the wood itself. Sinew backing is one example. In addition to being a more durable elastic fiber than wood (under tension forces) it shrinks when it dries and pulls the bow into a more reflexed profile.

For those bow designs which exert extreme forces, a composite of sinew backing with a wood core and a horn belly can be used. The sinew takes the tension, the horn is highly elastic in compression, and the wood core acts as a "filler material" to keep the tension/compression forces apart. On the minus side, horn, hide glue, and sinew are approximately twice the density of wood. If the addition of this higher density mass are essential because of high stress factors in the design, then the weapon would benefit from their application. If the design of the weapon is moderate enough to be successful, as an all-wood selfbow, then

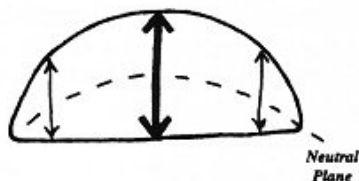


Figure 2. The neutral Plane.

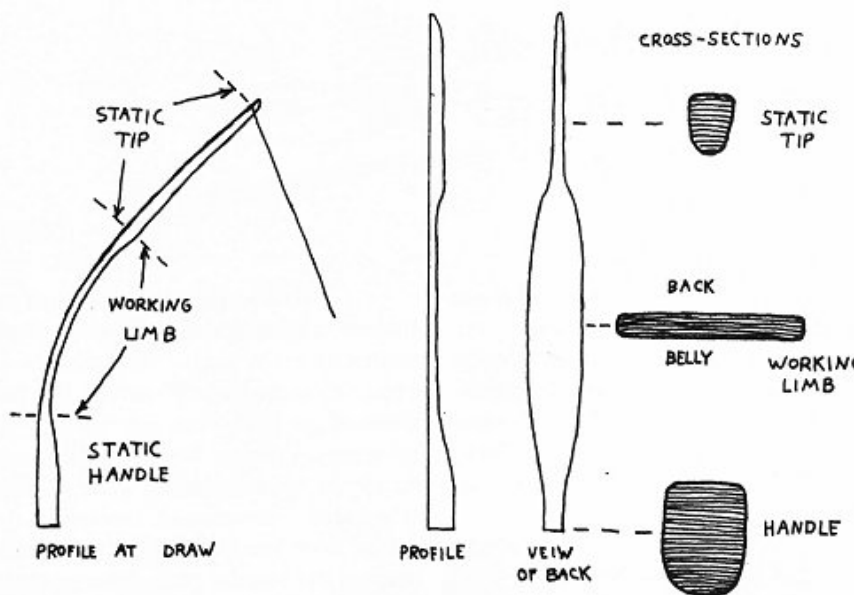


Figure 3. Improved Holmegaard style limb design.

the addition of sinew and horn will probably result in a net loss of arrow performance. The moisture sensitivity of hide glue and the economy of construction effort also present a negative factor against sinew backing and the addition of horn on a bow's belly.

One example of a simple composite bow style is the horse bow found among the plains tribes of North America. It is a short, narrow, and usually powerful bow used for hunting and war. The sinew backing and horn belly allow it to be pulled to full draw. A narrow and short design like this can break with all-wood construction.

The most extreme design to use all-natural materials is the Turkish bow. Its long static recurves almost touch forward of the handle when unstrung. The "working" part of the bow is a relative short section of the limbs which begin with a reflexed profile and then are radically bent with strong leverage forces from the static recurves. The stresses applied are phenomenal, as is the resulting performance. Turkish records for arrow flight exceed 900 "Turkish" yards. Modern records for "primitive class" flight competition exceed 521 yards (Dan Perry, *Primitive Archer Magazine*, Vol. 2, Issue 2, p. 5).

The Native American horn bow is another example of a unique high-stress design. Strips of horn are cut from bighorn sheep, heated, bent to shape for each limb, and joined at the handle. The sheep horn forms the belly/compression half of the bow and the sinew is applied to form the back of the bow. Both materials are exceptionally suited for the tasks applied to them, however, some replicators of the horn bow design report sluggish performance. Perhaps the dense "filler material" in the neutral plane area inhibits the recovery rate of the limbs.

A simplistic equation that I find helpful in designing a bow is the "longer/wider/weaker" rule. If a bow is designed longer, the stress is spread over a greater arc. If it is made wider, the stress is dispersed across the width of the limb, and if it is made weaker, less stress is applied to the bow. The principles can be reversed if the goal is to increase stress and therefore performance. However, if the goal is increased performance with its corresponding stress, narrowing the bow limbs may not be a good idea.

If one were to study the current rage of selfbow technology and attempt to design and build the "perfect" bow, (Figure 3) one would probably craft a weapon with the following details:

- A narrow handle to improve the archer's paradox and provide a comfortable grip.
- Wide flat limbs in the "working" section for efficient durable performance.
- Narrow deep static tips to reduce mass for increased cast.

The "perfect bow" would be a little over five feet long for a six foot tall archer, and the static tips would help reduce stacking at this relatively short bow length.

After crafting our "perfect weapon" (probably with many experiments and refinements) we might happen to turn around and look back about 9,000 years or so and find that we made few, if any, improvements on the state of the bowyer's art. Take the Holmegaard bow for example. Perhaps the only area in which its design could be improved is in the working-limb cross-sectional shape. The convex back applies greater stress to the center of the limbs than the edges. The use of a more rectangular cross-section would spread the "work" across the full width of the limbs for a more durable stress-resistant design.

How was the bow understood and developed by our ancestors? This is a question that will probably never be fully answered. Wood and cordage do not last long in the elements. The few examples that have come our way from peat bogs and caves have given us glimpses of the past, a past that predates written language and modern objective scientific theory.

The ancient bowyer was at best a subjective scientist, intuition and "feel" may have played the greatest role in the development of ancient archery. The language and therefore the intellectual thought processes of bowyers past no doubt were very simple, and yet modern technology has done little to advance wooden archery beyond a simple man diligently working with a stick in one hand and an edged stone in the other 9,000 years ago.





At the Makiwara: A Glimpse of Japanese Archery

by
K.I. Koppedrayner

"You're thinking too much."

Try telling that to someone who thinks that living is a matter of thinking. The instructor was right, though. I was thinking too much. About how the yumi, the bow, looked pretty new and about what happens when you dry-fire a bow. About how awful I'd feel breaking a bow by accidentally dry-firing it when my arrow slipped off the string. About how I'd better make sure I could catch the string with my first two fingers just in case it slipped out of the groove by the thumb in the kake, the glove, I was using to hold and pull the string. And about the groove holding that string in place, it didn't look all that deep and the string might easily slip out. And then there was that arrow, it was in there somewhere, too, balanced ever so lightly on that string I was clenching. How tight was that nock anyway? Hold on, hold on, hold on...no wonder the arrow kept slipping away. Thoughts, more thoughts, jostling thoughts. My head hurt, I imagined it like an elephant thrashing around in a net.

"You're thinking too much."

And then I started thinking about how too much knowledge is a deadly thing. Maybe if I didn't know about the damage I could do by dry-firing a bow, I wouldn't be worrying so much...

"You're thinking too much."

In kyudo, a form of Japanese archery that means the way of the bow, there is mention of seven defilements, seven impediments that get in the way. Thinking is included among these, as are a series of other moods and feelings that engage us: giddiness, anger, anxiety, depression, fear, surprise. The secret, of course, is not to get too attached to any of the impediments, or even to the idea of impediments, as I started doing when I began thinking about thinking.

At a recent beginners' intensive kyudo programme held at a Buddhist meditation centre in Vermont, reminders came in a number of ways, from Kanjuro Shibata Sensei, a master and teacher of traditional Japanese meditative archery and twentieth generation bow-maker to the Imperial Japanese court, from the several instructors who have learned from him, and from the bow and form of shooting itself. And only sometimes did these instructions come in words. Often the reminders came from the release, or when the arrow—the ya—slipped away before the release.

The kyudo taught over the weekend is a meditation form with roots that go deep into the Japanese Zen Buddhist tradition. It is a branch of the Heki Ryu Bishu Chikurin-ha, one of the schools of kyudo that has continued to this day to be taught in Japan, and now in the west.

To someone seeing this form of kyudo for the first time, it appears formal and stylized, yet at the same time dynamic and fluid. Often viewers are spellbound watching the arrows shot. The practice consists of careful movements,

called the Seven Coordinations (shichi-do) that carry the student or practitioner from a beginning preparatory posture through to the drawing of the yumi, to balance, and release, and the brief moment of contemplation after the release.

Each step is named and has its own purpose. In a hand-out prepared by the Ryuko Kyudojo, the kyudo center founded in Boulder, Colorado, by Kanjuro Shibata Sensei, each of the steps is illustrated and described. For example, the description of the Fifth Coordination, Hiki Tori, or Drawing the Bow, notes the push-pull effect of the draw. In the previous coordination, the yumi has already been raised, now the left arm pushes, while the right arm holds its position. Then, *"continuing in a smooth motion, together the left and right arms move, the right arm pulls the tsuru [string] back in a large arch, over the top of the ear, using the elbow and shoulder, not the wrist, as its source of strength. The left arm continues to push subtly, but doesn't extend completely. When the draw is complete, the ya [arrow] is at the level of your mouth."* The push-pull, actually more push than pull, allows balance of both left and right arms. In fact, Shibata Sensei suggested that a left-handed person can learn to do kyudo well. One thing for sure, this style of shooting allows a left-handed archer the possibility, when drawing and releasing, of not confusing kyudo with Western-style archery. With its emphasis on drawing the string, Western archery contrasts with the pushing movements of kyudo.

Each of the other coordinations is equally important, as is the moment after the release, when there is a lingering of mind and body, before the yumi is returned to a lowered position. With its stylized movements, fluidity, and intensity, kyudo is something better seen than read about, and better yet experienced. On the third morning of the programme a question was put to Shibata Sensei about the release, the moment of the arrow's release. His answer was to the effect that how can one know the feeling in someone else's heart. In other words, done rather than thought-through or studied. I suspect much of kyudo is like that.

The first morning of the programme, before we received our first introduction to the bow, Shibata Sensei spoke briefly about kyudo as a form of meditation, as a mirror to the self. He also told us that what we were doing was the shinkonsen approach.

Shinkonsen refers to the super-fast train connecting Tokyo to Kyoto, among other places, the one that goes one hundred and eighty miles an hour. Sensei's comments indicated that the pace of instruction and our movement towards shooting was somewhat faster than formerly done in Japan. And indeed, by the second day, the beginners were already starting to shoot at practice targets.

Before the programme began, I had a chance to speak with Don Symanski, an instructor in kyudo and a yumi-maker. He is a knowledgeable and wonderfully kind individual who makes exquisite pieces, yet he refers to himself as someone still reaching out to learn about yumi-making. He apprenticed with the Kanjuro Shibata family, living with the family in Kyoto, Japan, for over two years in the late-1980s. For nine years prior to that he had done kyudo.

I asked him what happens when someone begins doing kyudo and they pick up a yumi for the first time. His first response was to gesture towards a yumi, saying, "It's here. Try it," suggesting perhaps with that wry challenge that the relationship one has with the bow is highly personal. He went on to say that there are a wide variety of responses:

"Sometimes someone might pick up a yumi and say, 'hmm, what do you do



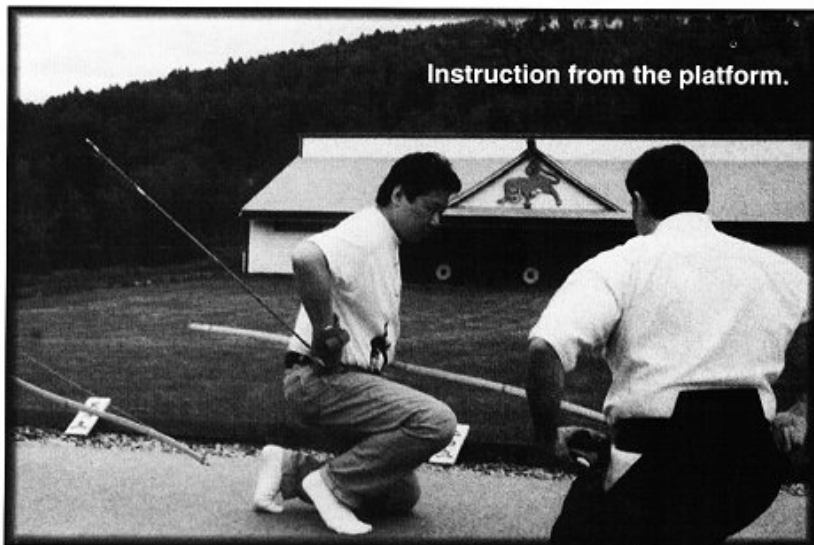
Kanjuro Shibata Sensei XX.

Photo by Mark Gabel

with this?" They feel themselves removed from it. Someone else may pick it up and feel they've been really challenged by this, this vehicle, or maybe they're very afraid, thinking, "This brings out my worst fears," so they put it down, or they pick it up and are willing to work with it."

There is no one response, no one way, but he added that sometimes there is a lack of sensitivity with people using a bow and arrow, a yumi and a ya:

"They're not seeing what they're doing. It may be the simplest thing, say maintaining the distance between the string and grip, that's spaced out. Or not looking at the yumi if it's cracked. Then something happens. Those kinds of things bring sharp lessons sometimes to people. But also the whole process of using something that is not manufactured, that is self-maintaining, requires attention, like a plant or child. You have to look at it, to see and feel what's going on with it, and



people don't have the training, basic earth quality training with something that's natural."

He contrasted that sensitivity, which he called earth quality, with stuff that goes on in the head—conceptual stuff—such as

"...life from television, it has an unreal quality. It doesn't have the interaction, or taste, or development of taste. More than aesthetic, it's learning to feel and discriminate many qualities of something through an interaction with them, through a synchronization of mind and body. Direct interaction and not having fear to do that, that's what's taught and developed over a period of time."

At both the opening and closing of our discussion, Don reminded me that the form of kyudo he has been taught is meditation kyudo, where the target is not a target, but a mirror. Recalling the words of his teacher, Shibata Sensei, he observed that in kyudo, the target

"...reflects what you are, what your state of mind is. The emphasis is on the development or the discovery of what you are in the process of doing kyudo over a long period of time. A lot of doing kyudo is mind-cleaning."

Referring to kyudo as a standing form of meditation, he mentioned the very strong influence of Zen Buddhism in the tradition that Shibata Sensei teaches, and in his style of teaching. Non-conceptual, non-discursive, there's not a lot of words, explanation, history:

"It's more just present. Go to the point, go to the point of what you're doing."

First shot was like that. To the point. I thought of first shot as coming twice, once, the first shot with a yumi, the first shot ever, done at very close distance before a straw practice target called a makiwara. The other was the first shot done from a wooden platform in the kyudojo. Here the targets are positioned twenty-eight meters from the platform in a target house. I saw someone weep at first shot before the makiwara. Another person looked exhilarated. I talked with others after their first shot from the platform. One person spoke of it as a humbling experience, explaining that she meant that in a positive way. Another

remarked that at the practice target you might think you're doing ok, but then, on the platform everything shows, you see yourself, everything, when up there. With my first shot from the platform there were remarkable feelings of intensity, vastness, and focus.

Don spoke about the learning process:

"A student comes and learns, like on a weekend like this, and gets a taste of first shot, many first shots. Maybe they'll shoot twenty, thirty times over this weekend. And then what happens, they'll receive intensive instruction, they'll receive a taste and they're asked to imitate a form, to develop, to begin to look at balance of form, memorizing the steps, beginning to see the logic of it."

He noted that some people continue, at other programmes, at other dojos, or just shooting with other people, where there might be some assistance or instruction available. He talked a bit about receptivity to kyudo:

"...receptivity to, openness to, continuing to work at more balance, say letting go, whether it was just letting go of some kind of fear with shooting, or hesitation or just obstacles of not being able to do something, even though in your mind you know you can, you know what it is that needs to be done, but something



New Dawn

OUTFITTERS

Your Bowhunting & Archery Supplier

Custom Bows by Bill Matlock
Great Plains and Martin Bows
James Schulz Leather Products
Swaged Aluminium Arrows
Grain/Spined Cedar Shafts
Complete Line of Hunting Supplies

Serving Individuals and Small Dealers
CATALOG: \$2.00 - Refunded With First Order

1 Quail Run, Mt. Sinai, NY 11766
 Phone: (516) 476-1682 FAX: (516) 476-1683
For Orders Only: 1-800-971-7747




Please Call
After 6pm
EST

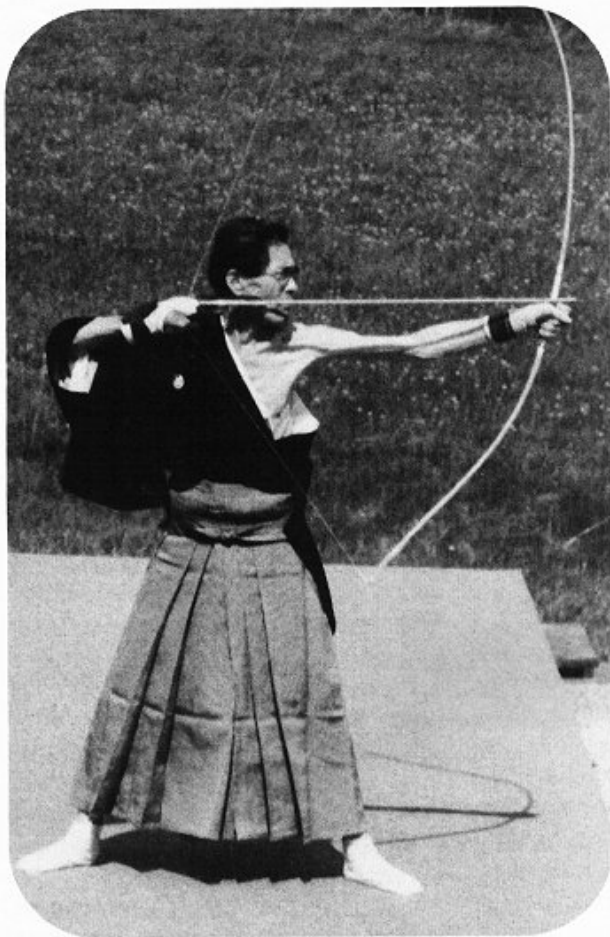


Photo by Mark Gabel

prevents you from doing it the way you see it being done or the way you think it should be done."

There are different reactions. Sometimes a student may accept the instruction, or they may react to it. Don used the word react purposely:

"I say react in that he may resist instruction. Everyone does that at some time. You think you have something, you want to hold on to something in the development and that's where people stop. Sometimes sooner than later. You think you understand it after one year, after six months, or two years or five years. Or the initial

romance is over and they're left to look at what they're doing, look at what they're seeing as to what takes place when they shoot, if they look at that. Or maybe underlying, they just wish to develop good form and learn to hit a target. Or there's subtle competitiveness with the process, with themselves, or with someone else. And, not that it's not there, it's there to be recognized with the person and with other people. And recognized and recognized again, ok, I recognize this, so what else is there? I think that's part of doing kyudo."

Earlier I had talked with Don about tradition. He spoke of qualities of respect and faithfulness, manners, and manners as an expression of gratefulness, suggesting that such qualities express an old tradition:

"... for a long time you don't see those aspects as part of kyudo. In doing kyudo you're doing it with yourself, on one hand, very much with yourself. But you're also doing it with other people and the relationship with that is very important. And with tradition. Tradition has the guiding quality that's brought down, and it can be altered by different teachers."

I asked Don about the role of the instructor. He referred to Shibata Sensei,

"... a master in the sense that he sees what the development can be over the long period of time. He's gone through with that process himself and he knows where's someone's at, he knows what the obstacle is and he knows basically what to work with precisely with that person. And, as a developing instructor, just one aspect of that is coming to see that and point it out to the student, in the least amount of words, if no words at all."

As a beginning student, I was advised that I should just take it in, see what takes place, and not try to explain, or feel that I had to explain. Of course, later, I was also reminded that I was thinking too much.



Note:

Don Symanski's yumi are available through the Krackow Company's catalogue, (412) 946-8332. K.I. Koppedrayar teaches at Wilfrid Laurier University, Ontario, Canada. She is the wife of Jaap Koppedrayar of YUMI Archery Company.

EATMON 66

Speed, Smoothness, Stability

These qualities are designed in the EATMON 66 to create a hunting bow with superb performance. All NFAA Traditional records were set with this bow.

Call or write for a free color brochure

Eatmon Archery
13443 Macadam Rd. S.
Tukwila, WA 98168
(206) 433-1167

Aluminum Arrow
swaging available
increase speed
by approx. 15fps

<http://www.compumedia.com/~connie/eatmon/>

RAPTOR ARCHERY TRADITIONAL AND PRIMITIVE ARCHERY SUPPLIES

STAVES/BILLETS • Yew • Osage • Hickory
Ash • Vine Maple • Mulberry • Oak

CUSTOM ARROWS & RAW SHAFTS • Hard Maple • Fir
Sitka Spruce

CUSTOM BOWS • Saxon • Knight
Raptor Selfbows

Braintanned Hides - Deer, Elk & Moose
Selfbow building tools & supplies
Arrow building tools & supplies
Custom Quivers - Leather & Fur
String Material - Dacron & Linen
Sinew - Deer, Elk & Buffalo
Books • Videos • Used Bows

Ted Fry • 502 Prospect St.
Hood River, OR 97031
PH: (541) 386-4503 FAX: 386-2434

VISA • M/C Catalog \$2.00

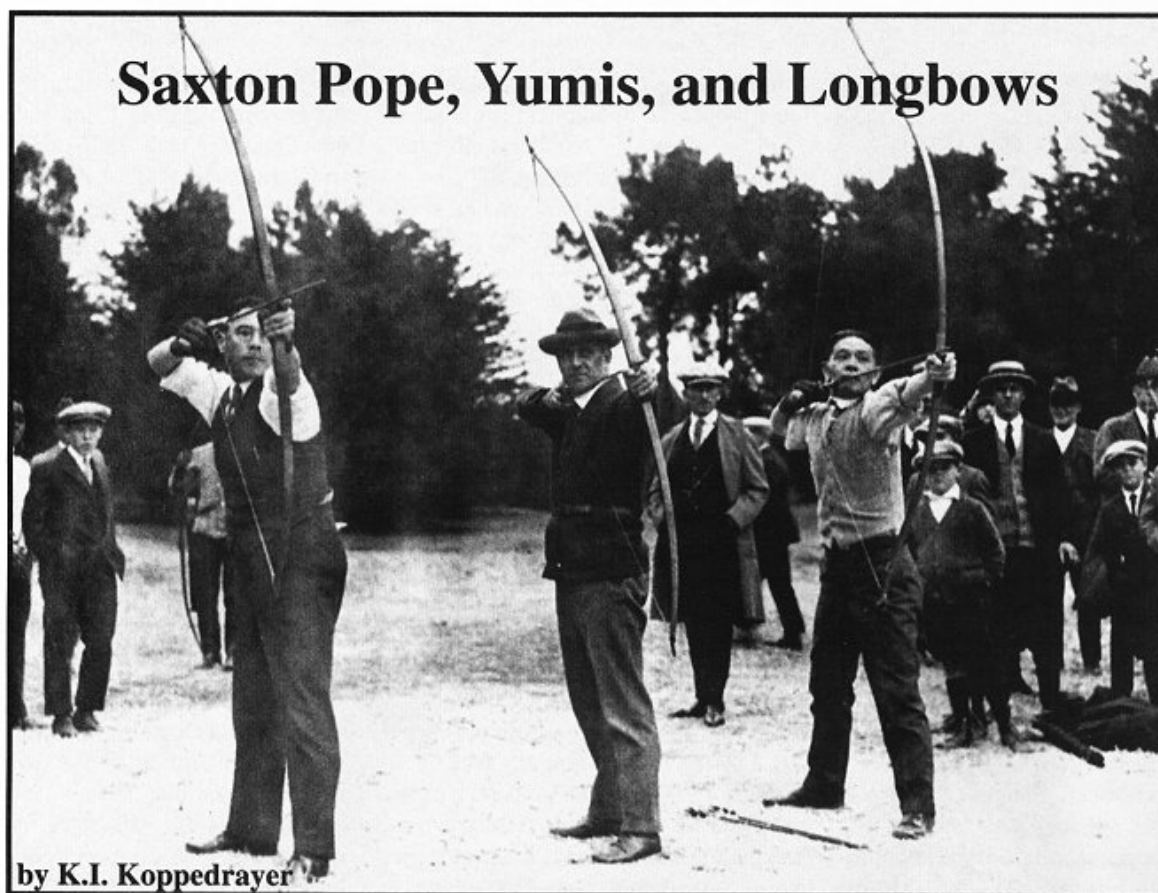


Photo provided by Dave Rauschenberg

Sometimes you only notice what you've been seeing all along when it is contrasted with something else. Different archery traditions are like that. Though we know that Japanese archery has unique characteristics, we might not realize how similar and yet how different Japanese and Western archery are unless we have a chance to compare the two styles directly.

The illustration above offers just such an opportunity. It is a previously unpublished photograph of Saxton Pope shooting with two Japanese archers. At present, little is known about this photograph, not even the identities of the two Japanese archers, except that it was likely shot in San Francisco in 1921. In "A Study of Bows and Arrows" Pope mentions two Japanese archers, Mr. H. Shimizu of San Francisco and Mr. Ogawa, who may be the men in the photograph. Taken perhaps at an exhibition or a competition, the photograph allow us to see for ourselves some of the contrasting features of Western and Japanese archery.

The details reveal a wealth of information about posture, orientation,

and movement. The way the three archers are standing show how the Japanese archers seek a lower centre of gravity than Saxton Pope. He has balanced his weight through his torso and limbs. The photograph also allows comparison of the positioning of arms and the holding of the bow.

Both Saxton Pope and the archer to the right of him are captured on film at full draw, while the archer to the left is still bringing his bow to full draw. Even though the bow he is using is not the asymmetrical Japanese *yumi*, his form matches that of *kyudo*. The bow has been raised and he has started his draw by pushing the bow with his left arm. Then, while continuing to push, he has begun to draw the string back with his right arm, using the Japanese shooting glove, the *kake*.

The distribution of movement between his right and left arms will bring him to a stance similar to that of the other Japanese archer. Works on *kyudo* indicate that the proportion of effort is 70 percent push, 30 percent pull. The Japanese archer at full draw shows the

stance identified as *kai*, meeting, the moment just prior to release.

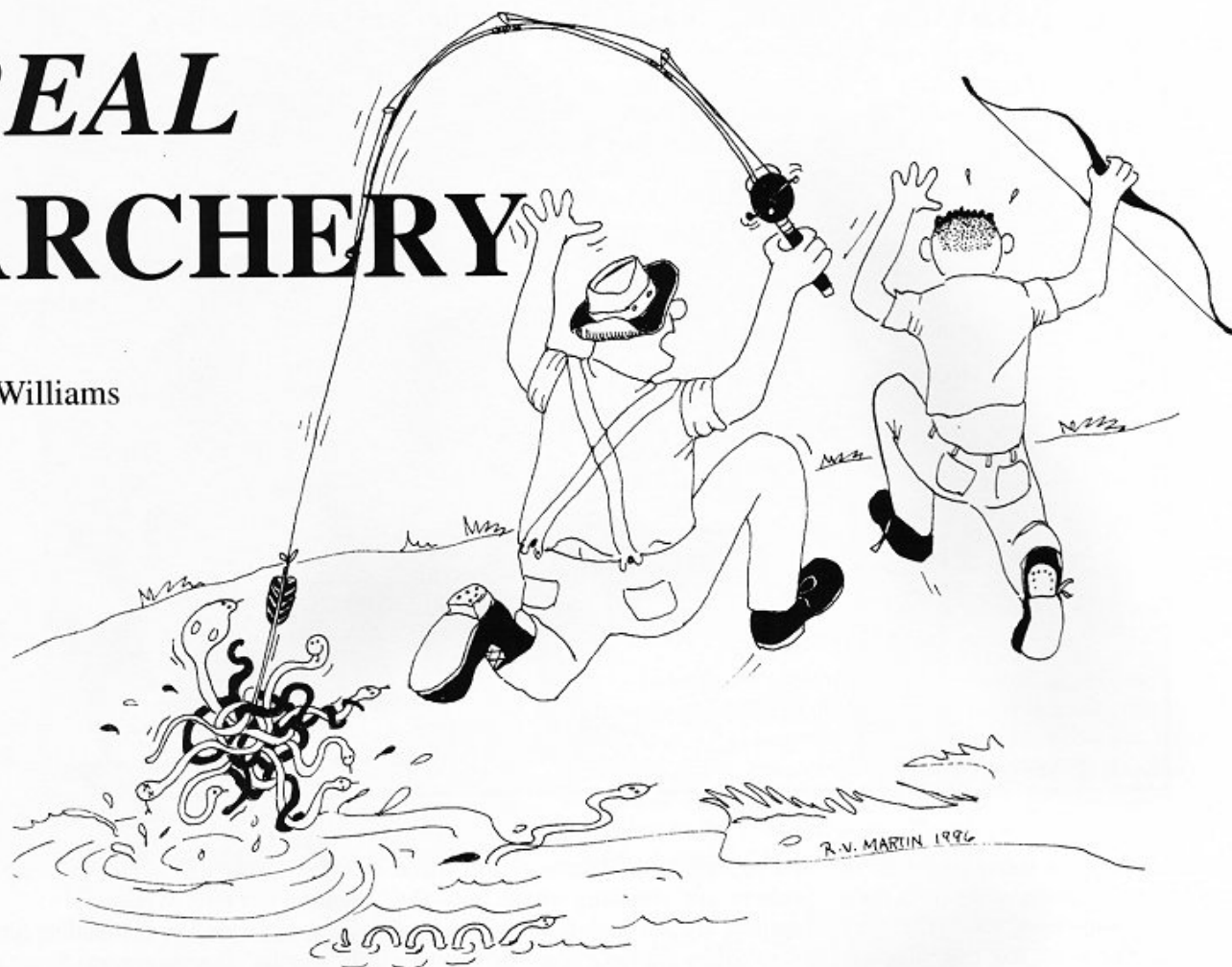
Saxton Pope is holding himself differently. The photograph is not clear enough to see whether he is using his characteristic thumb-and-fore-finger lock to pull the string, but it shows that his drawing point is just below his chin. His bow is canted, and the position of his shoulders indicates that his style of shooting puts more emphasis on drawing the string, in contrast to the push-pull of the Japanese archers. Pope is relaxed and yet his entire posture shows his acclaimed one-pointedness of concentration.

There is, however, a hint of something in his stance that leads me to wonder whether any sharing of techniques had taken place among these three archers. Were they simply demonstrating their styles, or did they attempt to try out each other's form? Without any further information we can only speculate. If anyone has any further insight, or knows more about this photograph, Instinctive Archer™ would be very interested in hearing from them.



REAL ARCHERY

by
E.T. Williams



It was a dark and stormy night. No! Wait! That's another story!

Actually, it was about 7:00 a.m. as we eased Earl's 10 foot flat-bottom aluminum boat off the roof of his 1951 Chevy. We placed a trusty but smoky 5 horsepower outboard on the rear and headed out on the water. We would be hunting marsh hens this morning, searching the intricate backwater canals that make up the system that changes from salt water to fresh water, in the then seemingly small town known as Miami. We made our way west and we soon came to a small lake that was so full of tarpon that they would occasionally bump the boat as they rolled on the surface. Earl was the boatman and I was the bowman. I would crouch in the front of the tiny boat with bow in hand as Earl eased us down the canals.

Sure, Earl was an archer bowhunter too, however his skills and target identification were not quite as refined as mine. Case in point, just the week before while hunting squirrels with Earl in Ft. Lauderdale, he had made his famous ricochet shot. It was almost noon and Earl was almost out of arrows. We were hunting some thick underbrush when we came to a clearing. Earl tapped me on the shoulder as he whispered "Watch this." The only thing in the clearing was an abandoned tractor tire, so I watched it. Earl eased his solid fiberglass recurve to full draw, released the string and his arrow was on the way. Perfect hit! Earl's arrow hit the tractor tire straight on, bounced back and almost hit both of us. "Great shot Earl, you almost hit both of us with only one arrow." "Didn't you see the squirrel?" he asked. Well I didn't, and that is why Earl

was the boatsman on this particular morning.

Earl throttled back on the Sea King as we entered yet another backwater canal. A small group of marsh hens scurried for cover in the distance. As I approached, I was able to get off two long-range shots before they vanished in the dense underbrush lining the canal. We collected my arrows and continued on. Soon we spotted a large group of hens at a reasonable distance. This time my aim was true and my blunt-tipped arrows found their targets. We continued to hunt until the heat became unbearable. Earl navigated us back to land as I cleaned the ducks. Back then, Earl's dad was about the best darn cook in all of Miami. Being single I guess it was out of sheer necessity. He baked and basted ducks in his secret concoction of white chocolate, honey, and sour orange.

While Earl's dad prepared the ducks, Earl and I prepared arrows for our fish hunt. Back then we didn't buy that much at the store, we simply fabricated what we needed. We inserted stiff wire near the tips of the arrows to act as barbs, and set up his spinning rod with strong line to attach to the arrows. Bow fishing for us back then required two people: one to shoot the bow and the other to operate the fishing pole. (I think the person holding the fishing pole always had more fun.) After dining on a delicacy of marsh hens, we retired for the evening.

The following Sunday morning finally arrived and we were soon heading south to an area near what is known as the Florida Bay (almost no-man's-land at that time). The area is where the fresh water canals meet the salt water marshes and flow into the Gulf. The area was known for an abundance of fish, mosquitoes, snakes, and an occasional alligator. Probably the best way to describe the mosquitoes is to picture a group of WWII fighter pilots making their devastating raids and then multiply the numbers. The crackling sound of an AM radio and the sound of the old chevy's 6-cylinder was music to our ears as we continued south. Earl's old Chevy was a real bow fishing car. Today you would need a new four-wheel drive util-

ity vehicle to travel less back roads than we had back then and to do what the old Chevy did back then.

We finally arrived at our destination and the mosquitoes were waiting for us as expected. We were able to walk the canal banks and shoot down into the water. Things were going as planned. I had shot several fish and Earl was having all the fun reeling them in. I had to convince Earl that he would have no problem hitting a fish using my 40-pound Bear recurve. "This, Earl, is a real bow!" I said, "And don't worry, there's not a tractor tire in sight."

Things were going great. Earl was able to arrow several nice fish and I was reeling them in (the hard part). Then for some unknown reason, we decided to check out a small ditch that ran parallel to the canal. WOW! Snakes! Hundreds of them were curled up all together in the ditch. Earl's arrow was already on it's way to the ball of snakes, and I was holding the pole. It didn't take those snakes long to realize that something bad was going on and they had better leave PRONTO! Well, before you could say "RUN" they were at our feet!!

Now I don't know about you, but jumping in a puddle of snakes is not a favorite pastime of mine. We gave the snakes the arrow along with most of the fishing line and got out of there as fast as

Self and Laminated Wood Bows European and American Designs Asiatic Composites

Matjaz Tomse, Slovenia
011 386 6440 3620

we could! Even if we did tangle with snakes, we didn't tangle with an alligator all day.

Back then people would throw rocks and sticks at snakes and alligators to keep them away. Today people feed alligators and the alligators have been known to feed on people (I suppose that is what the animal rights activists would call progress). As for the mosquitoes, rumor has it that the larger ones moved up to central Florida and became the ancestors of the Osceola turkey!



THE ULTIMATE ACCESSORY For the Drive to Your Favorite Hunting Spot

You Had Better **KNOCK-ON-WOOD** to Keep Your Good Luck

Introducing the Traveling



ATTACHES WITH VELCRO OR MAGNETS

SPECIAL INTRODUCTORY OFFER:

Small Plaque: \$1.75 Plus \$1.00 Shipping and Handling

Large Business Card Holder: \$3.00 Plus \$2.00 Shipping and Handling

KNOCK ON WOOD, INC. 105 SW 12th St. Redmond, OR 97756



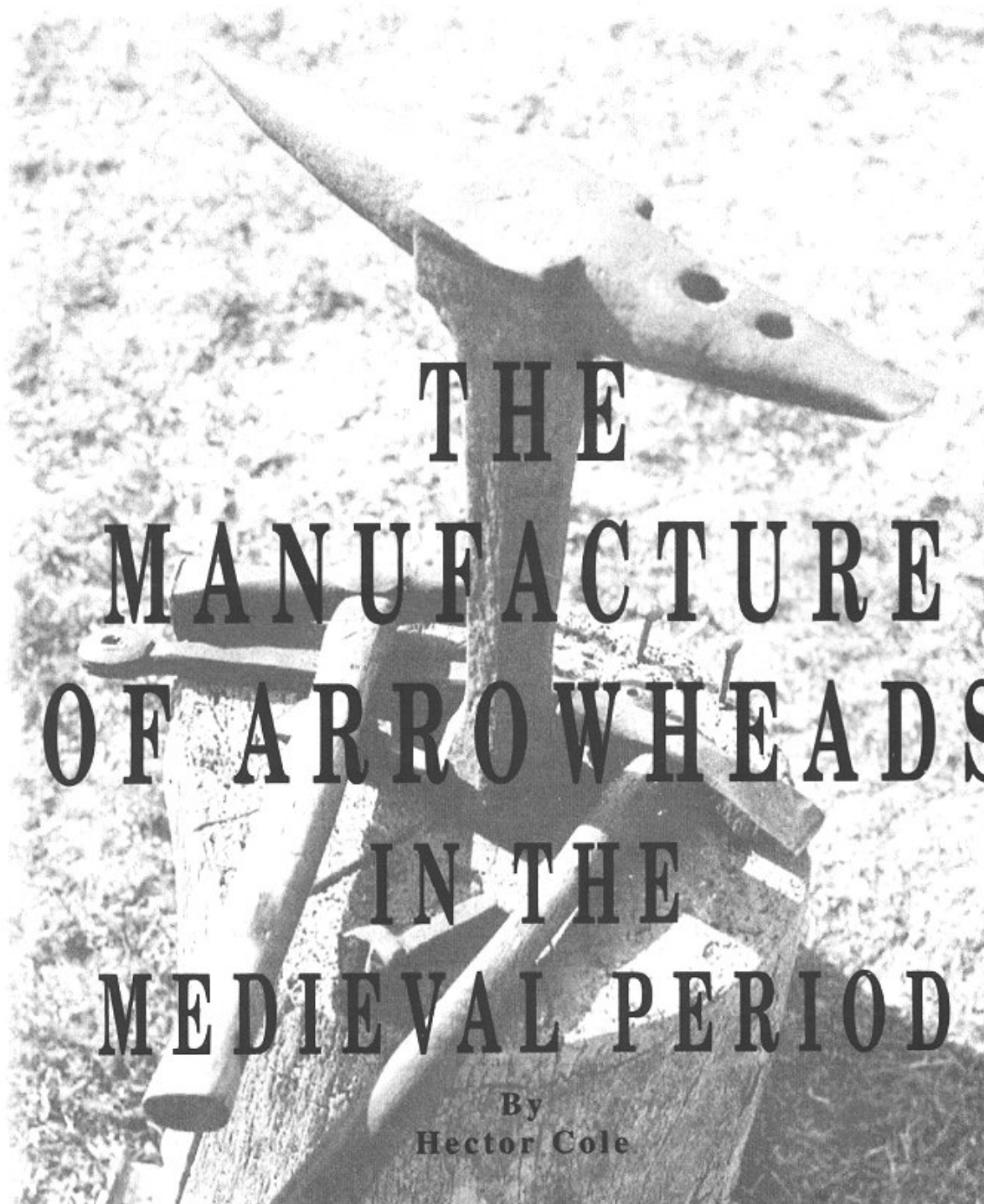
Wildwood Archery

CUSTOM CRAFTED BAMBOO BACKED LONGBOWS AND FLATBOWS

—artistic combinations of traditional bow woods and exotic hardwoods

—smooth drawing with exceptional cast

Daryl C. Forslund, P.O. Box 52, Hamilton, Montana 59840
(406) 363-1714



THE MANUFACTURE OF ARROWHEADS IN THE MEDIEVAL PERIOD

By
Hector Cole

Being I believe the only full time professional arrow smith in Europe I am often asked how I came to my present situation in the archery world. This has been revealed at many of the longbow seminars that Richard Head, Hugh Soar and I run but never has it been committed to paper until now.

My initial pathway to arrowsmithing began in my early childhood with the usual venture into archery by way of the bent willow stick and binder twine string bow and the withy arrow. It was a visit to the local cinema to see "Robin Hood" starring Richard Green that steered me towards the longbow and the clothe-yard shaft thus leaving my childhood archery behind.

I lived with the rest of my family on a small farm on the edge of the Linconshire fens.

larder. I was the odd one out with my interest in the bow which they all regarded as a childish toy and because of this isolation my quest for a real bow became a microcosm of the development of archery. Various alternative woods were used to try and find one that would shoot the furthest. These ranged from the humble willow, briar wood, lancewood, hazel, ash, and even hickory split from an old cart shaft. My first yew bow was cut from a branch and fashioned into a type of flat bow with a curved back and a flat belly, the handle being the full section of the branch used.

Arrows followed a similar development, experimenting with a variety of woods that grew straight and assorted feathers from the birds on the farm. The points to start with were put on the end with a knife and the end weighted with a coil of chicken pen wire (that's why the chickens were always getting out!!!) or a small nut screwed onto the shaft. Wooden points were not very good and had to be regularly sharpened thus shortening the shaft so small nails with their heads cut off were inserted into the end. They were better but tended to drive up inside the shaft and split it open.

The solving of this problem led to the forging of my first arrowhead using a six inch nail, a small bench anvil, a hammer, and a file but no heat. The end of the nail was beaten out and then shaped with the file and the flat tang was filed out so that it would fit in a saw-cut in the end of the shaft. The head was then bound onto the shaft with wire. This gave me a serviceable point on my arrow that would stop the rats that were plentiful in the area and I could compete on an equal footing with my brothers and their air rifles when allowed.

At this stage in the development of my archery my elder sister bought me a book for my birthday which became my archery bible. It was *"The Archers Craft"* by Adrian Elliot Hodgkins, and through it the longbow man in me came of age. With the aid of this book I was able to make my first true longbow, birch shafts fletched with goose or turkey feathers fitted with socketed hunting heads, fabricated from hacksaw blades and tubing in the school

metalwork shop when the teacher was not looking. I was still a lone archer and the bow was used for roving shooting or hunting small game or vermin but was respected by my Father and brothers who by now realized its potential as a weapon.

At the end of my schooling I left home to attend Dudley Teacher Training College in the heart of the industrial "Black Country" near Birmingham where there was no opportunity to practice my type of archery. It was not until I moved to Bristol to teach that I came into contact with other archers and eventually set up a school archery club at Malmesbury school where I taught for twenty five years before becoming a full time ironworker. I still run the archery club at the school which of course is a target archery club.

It is here that we leave my archery path and start on the forging route. I gravitated to the village blacksmith's shop at the early age of four-and-a-half years when I made my first piece of ironwork, a ring to go into the end of a pig's nose. Most of my childhood spare time was spent in the shop with the blacksmith. As the village school was across the road I would be in the forge at play times and had to be collected and returned to the class room at the end of

the play session to attend my lessons. This is where I learned the necessary basic skills of fire management and forging techniques. This love of working hot iron continued throughout my school career, especially in my third year at secondary school when a metalwork shop was established and I was able to learn other metalworking skills along with the forgework. It was at this time I started fabricating arrowheads using the methods shown in my "bible."

From school I went to college to train as a handicraft teacher, specializing in the teaching of metalwork. It was here that my interest in edged weapons developed and I wrote a thesis on the development of the sword in Western Europe. When I left college and joined the teaching profession I continued my interest in edged weapons and the forging of blades. This led on to researching the techniques of the Anglo-Saxon and Viking swordsmiths and the production of pattern-welded sword blades. In 1969 after building our own house in Great Somerford I set up my own ironwork studio where I was able to develop my skills as an ironworker and carry out more research into the techniques of the early ironworkers. One day a client visited the studio and spotted my longbow

Not Just Another 'Stickbow'...



Send \$1 for brochure or \$19.95 for Gary's advanced video **"Improve Your Shooting."**

Now, a bow that is designed to bring out the best in the archer.

"The Competitor"
made for champions!
Capable of shooting 200 FPS

Custom longbows built by Gary Sentman, holder of the world's record, since 1975, for the heaviest hand-held bow ever pulled. 176 lbs. at 28 1/4"



**SENTMAN
LONGBOWS**

8769 State Hwy 38 • Drain, OR 97435
Phone: (541) 584-2337

and arrows gathering dust and asked if I was able to forge arrowheads. My answer was "yes" and I had my first order for medieval arrowheads. Little did I realize the interest those first heads would create or the amount of research that I would be doing to achieve the required techniques and standards of the medieval smiths.

The first heads that I made were my interpretation of a medieval arrowhead, but it soon became clear that I needed to examine the real thing if I was to produce good copies of medieval heads that the longbow fraternity required. This research involved examining the different types of heads in museum collections for clues that would indicate the forging processes used to produce the particular styles, working out what section of bar to use to produce the various types of heads, making up special tools to help perform the necessary forging operations, recording the number of heats required to make each type of head, and recording the time it took to make each head. Most of the simple heads such as the bodkins were relatively easy to work out as they involved basic forging techniques that any competent smith would be familiar with. The barbed heads took longer to work out as they are far more complicated to make and require special skills to produce them.

The most difficult to forge to date is the three fluted arrow head and it took much time, patience, and material before I evolved the most efficient way of forging these heads. My indicator as to whether or not I am using the same techniques as the medieval arrowsmith is the natural reproduction of the fine forging detail on the heads of the originals through the natural sequence of forging operations that I use.

My work on forging arrowheads is far from finished as there are examples of heads that I am still not clear as to how they were forged and I need time to experiment and record my findings. My research is delving further and further back in time as people send me drawings of various styles of arrowheads from different periods in our history on the use of the bow. My first paper on the medieval arrow smith was out of date as soon as it came out in print

and I am still adding to the update that I started. I hope that you enjoy reading it and that the new version, when it is finished, will prove as interesting.

ORGANIZATION

This can be divided into the following areas, in the sequence of manufacture:

1. The mining of the iron ore and limestone, and the making of charcoal for smelting.
2. The smelting of the iron ore into blooms.
3. The shingling of the blooms into useable wrought iron. This is the state the wrought iron would be in when it reached the arrowsmiths forge.
4. The forging of the bloom into the useable sections for making the different types of arrowheads.
5. The forging of the arrowheads. As large quantities of different types of head would be required, the most efficient way would be for individual smiths to concentrate on one particular type of arrowhead.
6. The grinding and pointing of the arrowheads.
7. The heat treatment of the arrowheads.
8. The packing and dispatching of the arrowheads.

An individual smith would be quite capable of carrying out all the forging processes from the stage where the bloom reached his forge, as this would be necessary if he was working on his own. An

apprentice would also be given experience in all these areas of the craft. In a large manufacturing forge such as the St. Briavels centre, individual smiths would concentrate on one particular part of the process, as this would be the most efficient method of production.

The most comprehensive writing on the production of arrowheads concerning quantities produced, is Alf Webbs paper on "*John Malemort - Kings Quarreler*" from which the following information is taken.

John Malemort worked at St. Briavels castle on the river Wye, near Chepstow, in the Royal Forest of Dean, and the record of the time gives interesting accounts of the production of "quarrels" at the castle. John Malemort worked at St. Briavels between 1228 when he was sent to the castle till at least 1266, though heads were being made there before and after these dates. In 1228 when he arrived at St. Briavels he was paid 4 pence a day, and in 1265 when he was the master arrowsmith he was paid 7 1/2 pence a day for making 100 quarrels a day and 3 pence for shafting and feathering them. In 1257 the workshops produced 50,000 quarrels and these were dispatched to all parts of the country.

The quarrels were packed in barrels of bran for transportation and the heads were quenched in tallow or lard to help prevent rusting. Records show that between December 1232 and August 1233 they wore out one grindstone. No indication is given as to the diameter of the stone but they must have used up a number of stones over the year. It is not certain that St. Briavels was the only large manufacturing centre for quarrels but there was a ready supply of all the necessary materials for their manufac-

LEARN WOODEN BOW MAKING

Take a workshop at Cliffside under ERRETT CALLAHAN
Over 50 years experience as a bowyer

WORKSHOPS: Sept. 28 - Oct. 4 Primitive Technology
(Also flintknapping sessions in Sept.)

CALL OR WRITE FOR DETAILS

Dr. Errett Callahan Cliffside Workshops 2 Fredonia Ave. Lynchburg, VA 24503
Phone: (804) 528-3444

ture close at hand. It can be assumed that there were other areas of production in the country.

RESEARCH INTO THE FORGING OF THE DIFFERENT TYPES OF ARROWHEADS

The types of heads can be put into two main groups:

1. Barbed heads
2. Non-barbed heads

The simplest types of heads to forge are the non-barbed types. These can be made quickly from one piece of metal with the minimum number of tools. Most of the heads used for war arrows come under this category where quantity production is required. The barbed types require more specialist skills and tools, with the larger types requiring two different sections of bar for their manufacture.

The material used for arrowheads would have been wrought iron or at the best, a form of low-carbon steel that had become steel through the natural forging process allowing carbon from the fire to be absorbed into the wrought iron. The absorption of carbon into the wrought iron increases as the metal becomes thinner through forging, and by the time the head is finished it could have a high carbon content along the edges and at the point. This means that when the head is finally heat treated and quenched the point and edges will be too hard to file, but the main body will still be relatively soft. This would naturally prevent the heads from breaking upon impact against armour but still give a hard point and edges that can be made sharp.

Type 7 needle bodkins forged in wrought iron and treated in this way have been tested on sheet steel and have penetrated through the sheet with no adverse effect on the point. Any breakage has occurred on the shaft where the socket ends.

I think that the arrowsmiths would not have asked for or deliberately used steel for the following reasons:

1. Carburising of wrought iron into steel is a relatively long business and is costly in charcoal and other carburising materials.

2. The number of arrowheads being produced was formidable and had to be produced as quickly as possible.
3. The majority of war heads would only be used once or twice and would be regarded as expendable, even though many of them would have been collected after the battle for re-use. The larger hunting-type barbed heads however would have been looked on in a different light as they are more expensive to produce, so more care would have been taken not to lose them. A good indication of this is the fact that most of the large broad heads were actually pinned to the shaft to prevent their loss.

If they wanted all the heads to be hard with sharp cutting edges, the best way would be to carburise them in quantity after forging and grinding. This of course would mean extra processes, time, materials, and cost, but would be better than starting with an unknown quality of steel. The wrought iron heads that I have forged have only been what I call fire-hardened, that is they have been reheated to a near white heat and then quenched in vegetable oil after the grinding and finishing process. This leaves them with a hard point and cutting edges sufficient to do their job.

The forging of non-barbed heads such as bodkins requires the minimum of tools, materials, and processes, and the actual forging time per head is between six to ten minutes depending upon the type of head, the skill of the smith, and the quality of the material. The major influence on the time factor in any forging process is the number of heats taken throughout the process. With arrowheads, the time taken for each heat is short but the metal also cools down quickly. This means that it is not possible to work on more than one head at a time and is strictly a one-man operation. The time required to make particular types of heads can be split into three sections:

1. Forging of the bloom into the bar sections. This is the most difficult to work out, as the bloom would be forged into a handling length that would make a number of heads.

2. Forging the head.

3. Grinding and heat-treating the head. This time would vary depending upon the skill of the forger. The more skilled the smith the less grinding time needed, though the one particular type 16 head in the London Museum collection that is used as a pattern for the standard type 16 has been extensively ground to give it its final shape. Heads that were given a final forged shape in special swages and fullers would require very little grinding. A good example of this type is the one with a central rib along their length. Needle bodkins need no grinding at all if forged accurately.

The forging of barbed heads requires far more skill and time compared to the non-barbed types. Those with small barbs such as types 3, 13, and 16 can be forged from one piece of bar. However, care has to be taken when forging these heads not to overwork the metal or split too deep to the middle of the bar or the metal will crack and finally break off at the root of the split, leaving you with a type-5 head.

The large broadheads require even more skill as they are best made from two separate bars, a round section for the socket and flat for the blade, the two being fire welded together. This is because of the fibrous nature of wrought iron, which will split and break if forged at the wrong heat or is overworked.

NEO LITHICS

Flint Knapping Class
at Glass Buttes, Oregon
Limited to 10 Students
Cost \$350.00
For information, send SASE

Obsidian and Dacite
Bulk Raw Rock, Spalls,
Flakes, Pre-forms and
Slabs. For samples &
prices, send \$2.00

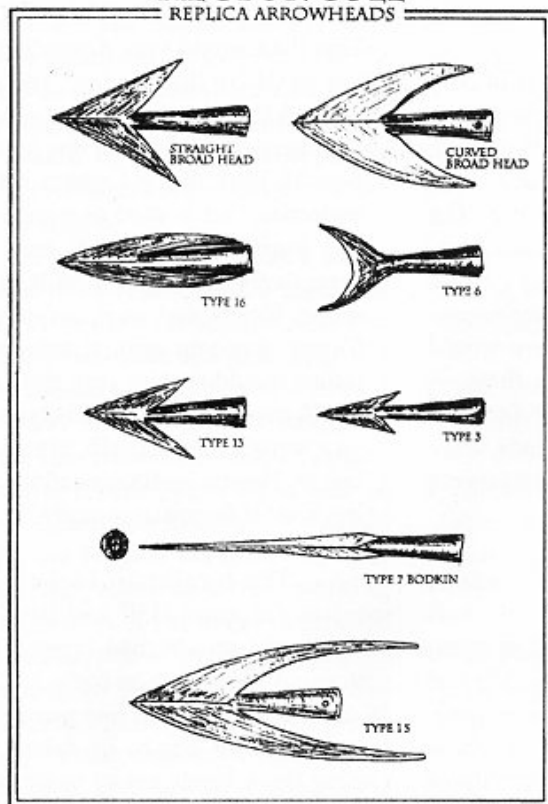
**2-Hour
Instructional Video**
Covers Spalling, Percussion,
Pressure Flaking, and Notching
\$23.00

Stone Knives & Points
Brochure, \$2.00

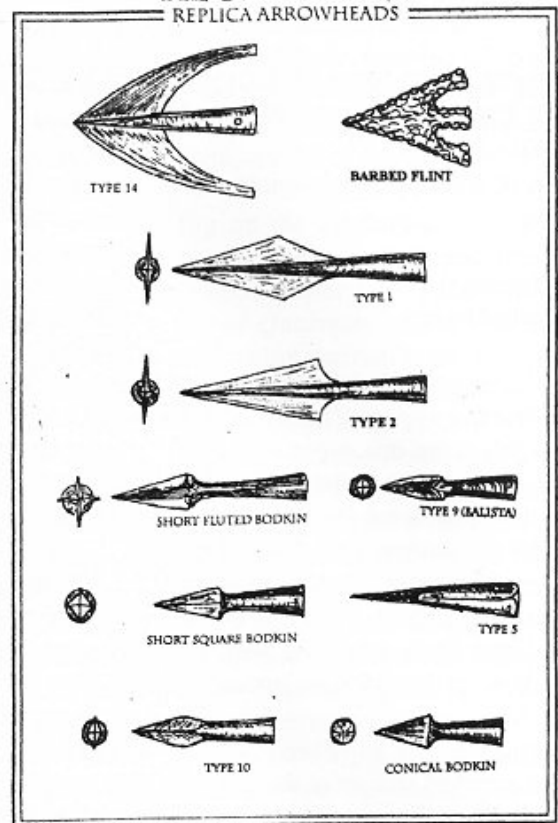
Craig Ratzat
NEO LITHICS
1530 "B" Street • Springfield, OR 97477 • (541) 747-1399



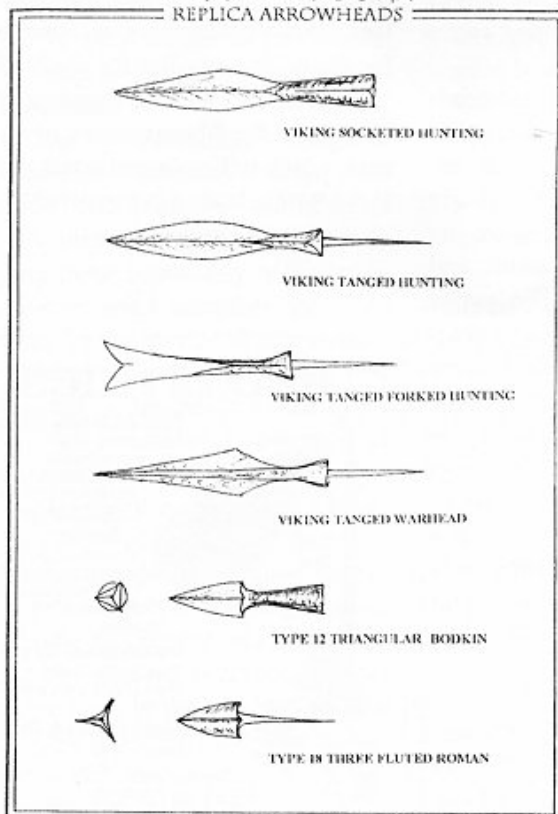

HECTOR COLE REPLICA ARROWHEADS



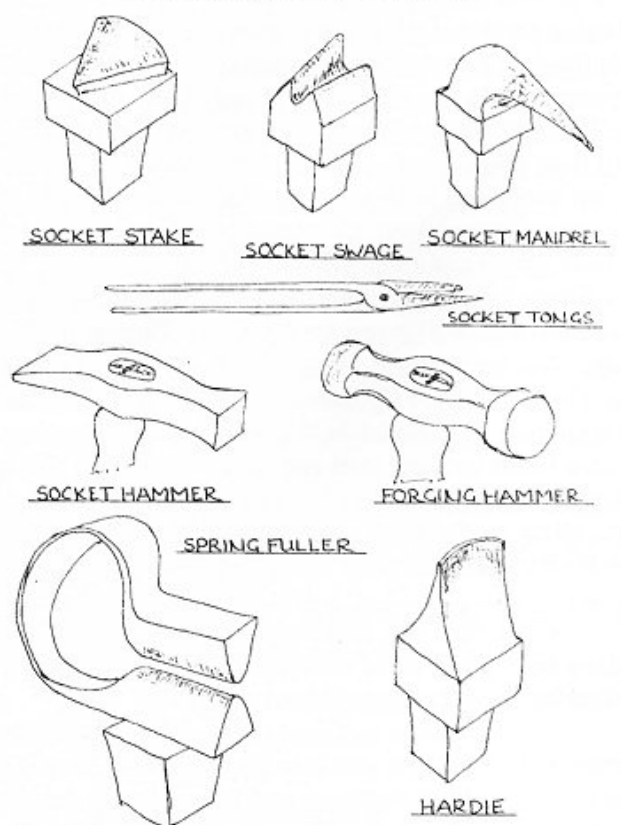
HECTOR COLE REPLICA ARROWHEADS



HECTOR COLE REPLICA ARROWHEADS



ARROWSMITH'S TOOLS



Welding the two parts at the root of the socket overcomes the problem of the blade breaking at the root while forging to shape as this type of head needs more working than the others. Heads made in mild steel can be forged from one piece of bar as mild steel is a far more tolerant material to work and does not require the same degree of skill as the forging of wrought iron. However, it is far more difficult to forge a two-part head in mild steel because it does not fire-weld as easily as wrought iron and is easily burnt, particularly when forging small section material.

Using the figures given for St. Briavels as a standard, one arrow smith would be capable of forging 120 type-10 bodkin heads in one day, working for twelve hours a day, or 2,600 heads in one year if he worked for 300 days per year. This means that for the St. Briavels site to produce 50,000 quarrels in the year 1257 there would have to be a work force of 14 arrowsmiths, 3 bar forgers, and 6 grinders/pointers. This gives a total work force of 23 plus others in the forge which would include packers, apprentices, and bellows boys, if bellows were hand operated. It would not include the shaft makers or fletchers. This means that there would be a total work force of around 50 producing quarrels at St. Briavels in 1257.

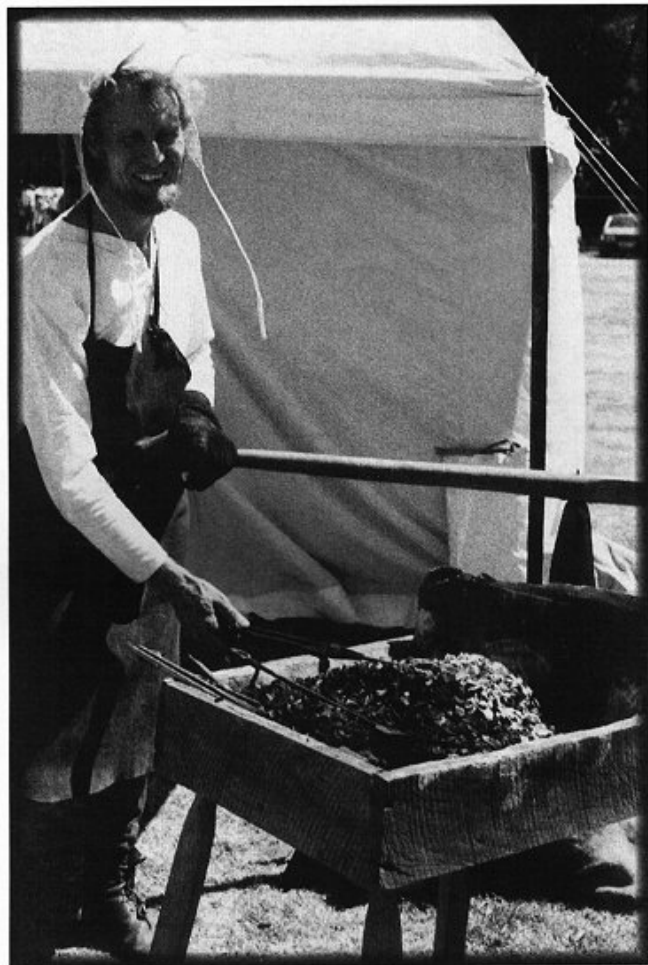
There is no known record of the special forge tools an arrow smith would have used, and the drawings of the tools are based on those I have made during my research on the subject. They are all variations on blacksmiths tools but made to suit a specific process. They are also designed to be used by an individual smith without the aid of a striker (assistant). The faces of some of the tools would have to be carburised and hardened so that they would withstand the constant hammering without losing their shape. Those tools with hard faces are the anvil, socket stake, chisel, hardie, punch, and hammer. The anvil shown in the diagrams is my impression of an arrowsmiths anvil based on the processes used when forging arrowheads. It would be mounted on a wood block that would be some 10 inches higher than the normal anvil height of around 34", depending upon the height of the smith.

I have shown most of the stakes as I have made them, that is so that they fit into the hardie hole in the anvil. I have not shown a hardie hole in the drawing of the anvil as illustrations of medieval anvils do not always show this hole. I feel in reality that they would have had the stakes fixed in wooden blocks and arranged around them for ease of working, and the tang of each stake would have been pointed as shown on the barb stake.

The arrowheads used in the medieval period can be divided into two main groups Barbed and Non-Barbed.

BARBED BROAD-HEADS

All the heads illustrated were used in a war situation but the barbed were used for hunting small or large game because they have cutting edges which would cause any strike to the body to bleed deeply. They were pinned to the shaft through the socket to prevent them being lost easily as they would have been just as expensive to make in those days as they are today.



Hector Cole at work.

Type-16 Barbed Head. This head was used for both hunting and war although evidence suggests that it was developed from the curved broadhead for war use in the late medieval period. It was designed to give the maximum penetration and maximum cutting power that would inflict a deep wound on the enemy. There are many variations of this type of head both in shape and size. On some the barbs are so small as to be

Type	Forging Time	Heats	Grinding/Pointing Time	Section of Bar mm.	Length Req.
3	12	11	4	8 Diam.	22
6	15	11	6	12 x 6	45
7	9	7	1	8 Diam.	58
1	11	10	3	12 x 6	40
9	7	7	3	10 Diam.	35
Straight Broadhead	20	17	4	20 x 6	40
16	17	15	6	16x6	40
10	7	5	3	8 Diam.	28
15	30	23	6	20 x 5	48
Fluted Bodkin	11	7	4	10 x 10	35

hardly classed as barbs but more like raised edges along the sides. This is the type of head that was more than likely fitted to the shafts of the Mary Rose arrows.

Type-15 Devizes Swallowtail Broadhead: This long, barbed broadhead was used for hunting large game because it not only flew well but also cut a deep wound. The long barbs gave the maximum length of cutting edges.

Type-14 Curved broadhead: This is the largest of the heads illustrated and was used for hunting large game such as deer or bear. It would have been used at short distances, where possible, to utilize its maximum cutting power. It was also used in the war situation to shoot at the horses and cause severe bleeding and immobility.

Type-13 Small Broadhead: This small straight broadhead was used for hunting small to medium size game and also in the war situation for shooting at men and horses.

Straight Broadhead: This hunting head was used for hunting large game such as boar or deer.

Curved Broadhead: This type of head was also used on large game such as boar or deer and would give a much deeper cut than the straight broadhead.

Type-3 Barbed Head: This head was used extensively in the early medieval period for both war and for hunting small game. The long socket would allow deep penetration inflicting the maximum damage to the enemy or quarry.

Type-2 Anglo-Saxon Broadhead: These two heads were used for war purposes and for hunting game and were popular throughout the medieval period. These heads have been successfully used for hunting in America.

I have included these two types in this group as they are both broadheads with long cutting edges even though they are not barbed.

NON-BARBED HEADS

These heads are the true war heads used in battle to inflict the maximum damage to the enemy. Most of the heads found do not have a pin hole in the socket for fixing them to the shaft because on the whole they were only going to be shot once and a head left in the body when the shaft was pulled out would help increase the mortality rate. It is possible that the ends of the shafts were tapered to take the heads but the heads were not put on until shortly before the battle took place. It has been found when fitting these heads that a hard push and twist is often sufficient to secure the head to the shaft.

Type-12 Triangular Broadhead: This head was used against knights in plate armour and would penetrate armour if shot at close range.

Type-10 War Bodkin: This was one of the most common war bodkins that would penetrate chain and plate armour at long and short range.

Type-9 Bodkin: This war head was used in the Roman period as well as in the medieval period and was designed to penetrate most types of body armour.

Type-7 Needle Bodkin. This war head was popular in the early medieval period and was designed to penetrate chain mail. Tests carried out have shown that it was very effective and would pierce right through a body clad in chain mail. Tests have also shown that it would easily penetrate the modern flak jacket. The needle bodkin was made in a number of different sizes from small two-inch long ones with 1/4" sockets to one eight inches long found in a castle moat in the Midlands. Other bodkin heads that have been found are the Square, Conical, and Fluted Bodkin, all designed to pierce the body armour that was worn at that time.

The one head that does not fit neatly into either group is the Type-6 Forked head. It was a quite common head of the medieval period and much speculation has been given as to its uses. One of the theories is that it was used to cut rigging on board ships. If this is so, why were none found on the Mary Rose because she was putting out to sea to

fight a ship battle. If it was used for this purpose then the rope would have to be very taut for the head to cut it. Also the head would be spinning and the chances of it hitting the rope at just the right angle would be rather low. I would be interested to hear if anyone has carried out any tests of this nature and the results they obtained.

Another theory is that it was used to shoot at the hind legs of the horses to cut the tendon and bring the horse down. This is not practical for the same reason as the rope cutting and far more difficult to achieve. I think that the most plausible uses for this head are as follows: (1) It was used for shooting at game birds because the two points would make it less likely to skid off the feathers. (2) In war it was used to shoot at the horses to inflict as much pain as possible to the animal which would then unseat its rider and cause confusion. I say inflict pain because as this head strikes it will tear the flesh which causes pain, unlike a broadhead which would cut like a sharp knife without causing immediate pain. This has been noted by hunters who have shot deer which have continued eating after being hit, showing no sign of being struck by the arrow.

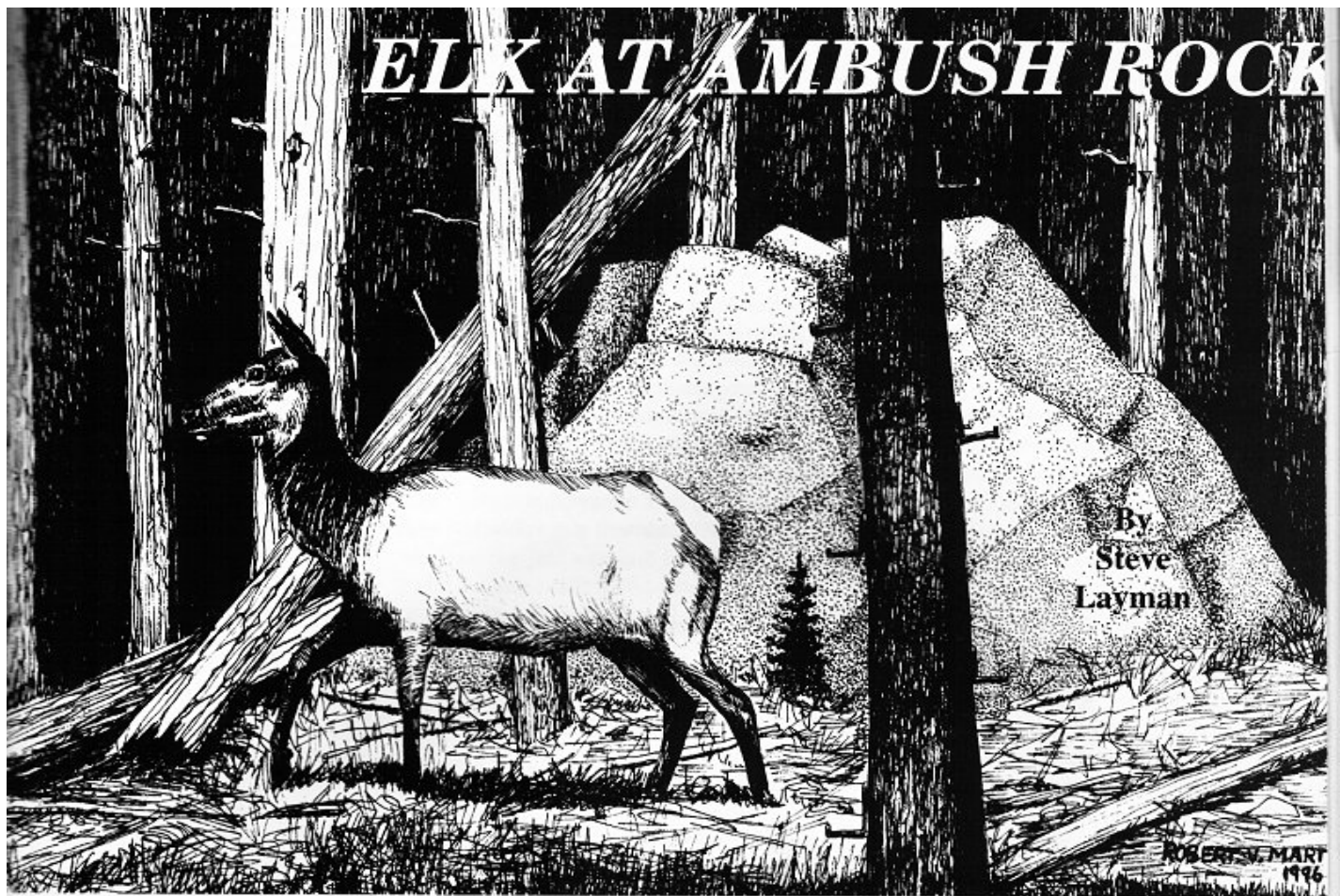
Further ballistic testing of arrowheads and the results can be found in the book "*Longbow*" by Robert Hardy.



AUTHOR'S NOTE:

I would like to give my thanks to the following:

- Alf Webb, for the extracts from his papers on St. Briavels.
- John Clark and the curators of the London Museum, for allowing me the time to study their collection of arrowheads.
- All those who have used the heads that I have made and given me valuable feedback on the way the heads perform.



When the elk cleared the only cover between us, it was broadside at 12 yards. With my bow ready for the moment to shoot, the words that Bob had said as I left camp, long before dawn, rang in my head: "Pick a spot Steve, *PICK - A - SPOT*."

The 1995 season found my hunting partner Bob and I moving to a new area to hunt. Just a few too many hunters had led us to try another location. With a new area scouted and elk spotted prior to our two weeks off, the hunt was set!

We hunted hard through the first weekend and into Monday without seeing any elk or fresh sign. It looked like all the old sign that we were seeing now was the same sign that we had seen earlier in the season, so we thought we might just swing over to our "old spot" to see what, if anything, was going on there. It took about an hour to drive to the area and the first thing we noticed was far fewer camps along the way than last year! We pulled off the main road into our "old campsite" and found the area void of other hunters. We took off with our recurves on our backs and our hands full of mountain bikes. The access roads in the area were closed to motor vehicles, so the bikes made it easier to cover a lot of ground, in not a lot of time. And we covered the ground! The ride into our desired spot was nothing less than the Baja 1000. Our trek took us up and down different draws, over lava flows and down steep, rock rolling shoots that looked a lot like the surface of the moon.

As we traveled ever deeper into our hunting area we would stop to check for sign, human sign. Nothing, no boot tracks, no bike tracks, nothing. It looked as though the crowds were being left behind! No one had been into what we had come to know and love as our "Secluded Valley." The next fork was now a cow trail. This was the fastest part of the ride, long, steep, and smooth. Just stand on the bike and let your eyes water (funny how my eyes also watered on the way back up, crying all the way. Man that was a long, steep hill).

As we crossed the creek at the bottom, we knew that this final trail would tell us a story. Has anyone been here? This was a good trail deep in the bottom of the canyon, but still we have run into dedicated hunters exploring the area. I know that I was holding my breath and I think that I noticed that Bob had his fingers crossed. We made our way up the muddy bank of the creek and as we neared the trail, our hopes were that good fortune would shine on us again as it had over the ground that we had already covered.

There it was, the final trail—nothing! No tracks! The Secluded Valley was waiting. The excitement of seeing that no one had been on the trail made the final two miles uphill easy (well, easier anyway).

The first site of the high mountain meadow brought back the feeling of seeing a dear friend again after a long absence. We didn't say anything as we dropped the bikes. We

just stood there, taking it all in. The mountain air was so fresh. Believe me, I know, because I was sucking down more than my share after riding the grinding, rock-strewn five miles across creeks, over blowdowns and low hanging limbs to get to this peaceful spot. The long ride and the work of the chore of getting there disappeared quickly with the site of the knee-high grass gently moving with the breeze. Here the forest drops down steep canyon walls to meet the verdant meadow. Its border is guarded by majestic aspen trees, all scarred from many years of bulls rubbing their ivory tipped crowns on them. And in my mind's eye, I see them lower their racks to their backs and scream a bugle to invite all comers, young and old alike, to dance the dance. The sight and sound of the aspen leaves moving in the gentle wind was hypnotic. This was the absolute embodiment of beauty. The headwaters of a cool, clear mountain stream, the piece of heaven on earth that we fondly call the Secluded Valley.

Three canyons feed into the meadow, one we call the "Dark Canyon" because of the towering timber on the narrow steep sides, daring any sunlight to reach the ground. To venture into it before daylight or stay after nightfall, one should make sure they have extra batteries and an extra flashlight. The second canyon, the bigger of the three, has some great wallows in it. We've had some incredible past hunts in this one alright! Even a hunt that put a nice five point bull just eight yards from me, nose to nose. At full draw, waiting for him to turn, I just couldn't hold it any longer and had to let it down. Back then I was just a beginner, you know, with my training wheels still on. That was several years ago, now I pull a beautiful recurve, built for me by my hunting partner, Bob Martin. Of the canyons, the third was the one we hunted the least. It was a blow-down fortress. Dead trees laying everywhere. We had been in there before and didn't touch the ground for 200 yards. Something like you would

see at a circus. So we seldom forced ourselves up there.

I took the Dark Canyon, Bob took the wallow canyon, we would meet back at the meadow after dark. I still hunted up the trail for about 30 minutes, remembering so many little things, landmarks that would never be forgotten—like "whale rock" jutting out of the ground, looking just like the head of a whale coming out of the sea. Then the spot that I had a stand-off with a little spike bull one year. Another where a nice bull took me clear to the top of the ridge, only to leave and break my heart, in the shadows of the Dark Canyon! When the canyon finally spit me out that night long ago into the meadow, it was as black

It turned out that Bob had gotten into some elk too, and after at least 10 or 15 minutes worth of story he calmly mentioned that he had gotten a shot!

and dark as it could be. What a comfort to see Bob's flashlight on the other side of the meadow. So many memories were locked within these canyon walls. It is just a great place to be!

A moving fur coat brought me back to the present quickly. Straining to see better, I slowly made my way up within 50 yards of a nice five point bull. Lots of trees separated us and the one problem I had was that I was bigger around than most of the trees. But I kept closing the distance. I tried a little cow talk but that didn't seem to do much for him. He just kept on feeding. So I thought that I would get creative and give a little rag-horn bugle. That got reaction! All that was left of him was a dust cloud in the shape of a bull. He didn't want anything to do with what I was selling.

Before it got dark, I wanted to get up to a place we call "Ambush Rock." This was a place that we had always reasoned that if a hunter was to sit on this rock, they would surely kill an elk! The rock is like a fortress at the intersection of two well-used trails. But in previous seasons we just had too many elk running around bugling at us, to sit down.

Tonight I wanted to check the side trail to see if there had been any elk on it. The trail was covered with fresh sign and plowed with tracks. I told myself, "I'll be back" and headed down to meet Bob.

When I finally got to the meadow, I had used up all the daylight. I waited for about 20 minutes listening to the coyotes sing in the still night before Bob showed up. Of course, we had to cow talk back and forth so we wouldn't miss each other in the dark. I told him all about what had happened and what I had seen at Ambush Rock. It turned out that Bob had gotten into some elk too, and after at least 10 or 15 minutes worth of story he calmly mentioned that he had gotten a shot! Now I have shot targets and hunted with Bob for more than 10 years and when he says he got a shot, that generally meant that we had a tenderloin cooking. I think that it would only be right to refer to his

recurve as "BROWN GRAVY." Sure enough, he had shot a nice big cow elk, but because of how dark it was and the rough area, we thought it best to track her out in the morning. Had we been thinking ahead, we would have thrown a spike camp together and camped there, but we didn't. We still had a long silent, dark haul back to camp.

Early the next morning we were hot on the trail. This was one time that we didn't curse the blow downs. It made tracking easier at times because when the elk had gone over logs, it left a nice road sign to follow. It didn't take long to find the elk. It was a nice big cow! Bob's shot was uphill and the hit was low in the chest and angled up and out the other side, behind the front shoulder. What an incredible shot, that's Bob. It was time to go to work. I started boning the front quarter while Bob dealt with the rest of that side. We got the elk boned out and in the quarter bags and the pack out began. The sun was getting hotter by the minute and we realized that we had consumed all of our water. Then it was take two steps, crawl under a log, take another step and go over a wall of

logs. We were a good hard hour from the Secluded Valley, then from there two more hours to the truck. I had a survival water filter straw in my pack to drink through and we didn't hesitate to put it to the test in the creek. It did the trick. We dropped the first two quarters in the meadow and then went back for the other two on the ridge. We packed those two clear to the truck—three hours! When we got there we decided to drive about five miles to a spring that was piped to the surface. We both drank and bottled all we could. We still had two more quarters waiting for us in the meadow. I don't want to cry or whine so I won't go into all the details about the pack job. But what I will say is that we had left camp sun-up on Tuesday morning and got back Wednesday morning at 2:30 a.m. We slept the rest of that day and took Thursday off except to move our camp back to our tried-and-true hunting area.

The next afternoon I was back in the valley. My still hunting didn't show me an elk. It wasn't surprising after I had heard the beating of hammers. Someone was building a treestand up on top of the ridge. I knew the exact trail that they would be on, after all, I knew "my forest." Ambush Rock was about halfway to the top. I wanted to get up there to take another look at the trail. Sure enough, an elk parade had come through. It was then that I had to make a decision, how was I going to hunt this? I didn't want to push elk out of the area and I knew that I didn't want to go back into the canyon that Bob had harvested his elk in. After all, it wasn't hell, but you could sure see if from there. Then it started: Some hunters were bugling all around the ridge tops. No wonder these elk weren't talking at all. My plan was set. I would be at Ambush Rock in the morning. With other activity in the area, I would let them do some work for me.

It was getting dark and I started making tracks out of there. Back at camp we tied a tree stand to my pack frame along with my fanny pack in preparation for the morning hunt. Bob would be hunting for deer in another area, so I would be on my own. As I prepared to leave camp the next morning, Bob called me over to the tent for some last minute reminders. *"Be careful in the tree and pick a spot Steve, PICK-A-SPOT."* I left

camp an hour earlier than usual, 4 a.m., to walk my equipment down. It was just too awkward to try the bike in the pitch dark of "the craters."

The pre-dawn glow in the meadow was a sight that would again make you forget about the long hike and hard work to get to this place. Even though I was in a hurry to get to Ambush Rock, I didn't miss the chance to stop and enjoy the sight of the early morning in the meadow. Before I had ever reached the rock, I had already determined what tree I would use. It was a towering tamarack that reached to the sky. The trail I would watch was on the steep hillside so I had to get pretty high to even be at the same level as the trail. The hardest part of the job was just being quiet. I was feeling really good about the set up. I pulled my pack frame and pack into the tree after setting up the treestand and then went back down to get my bow. While I was on the ground I went to see if anything had been on the trail through the night. I had dusted the trail the night before, nothing, no tracks! I was probably dealing with some daylight elk movement!

I got back up into my stand, I pulled my bow up and hooked it onto a branch. Everything secured—everything off the ground—whew! Time for a drink of water. Just as I reached for my bota bag it happened, elk came off the hillside behind me and started feeding in the bottom 30 yards away! I hadn't been in my stand for more than 10 seconds! Let me tell you, I was scrambling for my finger tab—forget the arm guard—get the camo net on my face—arrow on the string—bow ready, get it up there—don't move, eyes looking my way. The huge lead cow elk was almost on my crossing trail. It was looking up the hill past me and then down the canyon below. The cow turned to the other six elk and softly "mewed" to them. What an incredible animal! They all fell into line and they were coming up "my trail." When the lead elk cleared the only cover between us, it was broadside at 12 yards. With my bow ready for the moment to shoot, the words that Bob had said as I left camp, long before dawn, rang in my head—"pick a spot Steve, PICK-A-SPOT." I saw my spot and I was waiting for it to turn to the right and uphill for a quartering away shot. Eye on the spot—full

draw—smooth release—nothing but spot. The elk jumped down in front of me about 20 yards and stopped, turned, and looked back from where it had come. The look on its face was the "what in the world was that" kind of look. I was motionless, I wasn't even breathing, but I knew that this was a dead elk just waiting for a place to fall. After walking about 30 more yards, down it went. Less than 60 seconds!

I sat back down and had my drink of water. That is when the waves of different emotions began to crash on my shore. From tears to howls of laughter and thankful prayer. I had just harvested my first elk!!!! I sat in my stand for 30 minutes. I knew the elk was down solid. I just didn't want to deprive my butt from getting tired of sitting in a tree, after all, it just doesn't happen like this, right? The very last thing I thought I would be doing this morning was taking this tree stand back down. I knew the elk was down for good, still I crept very carefully over to it. As I knelt beside the elk the emotions rolled over me again. This was my first time and I wanted to make sure each emotion was digested totally.

I took my stand back down and gathered my things. I figured the best thing to do was to get it back to camp and bring my quarter bags back. After returning to camp, I left Bob a note. I couldn't find anything to write with, so with broken matches I spelled the word "AMBUSH" on the mat in front of the tent door. Then I put a rock behind that with the broken, bloody shaft from the wooden arrow that I had built (another first for me) I thought that he would get the idea.

I returned to my elk and after I cleaned it out, I was able to slide it across the hill and down under a fresh blowdown that offered a lot of shade. Skinning wasn't a problem. Boning the front shoulder wasn't a problem. But that was all the further I got while helping Bob with his earlier that week. I kept looking over my shoulder to see if Bob was coming to rescue me. Still no Bob. When I started on the first hindquarter I stopped to remind myself what I didn't want to do was to cut it up into a whole lot of pieces. Come on Steve, keep it in the largest mass of meat that you can. It took a while but I got

the entire side done, rolled it over and started on the other side. Then I received my bonus! Four cow elk and three calves came off the ridge above me and stopped 10 yards away! What a sight! I had left my pack at camp (didn't need the extra weight or bulk of unused equipment) but I put my camera in my pocket. I took three pictures of them before they decided to move out. What I didn't know about this camera was that the auto focus would zero in on whatever was in front of it. I got three great pictures of a branch about two feet in front of me with nothing but black background, good job Steve!

The knife I was using was one that my wife and daughters had given me as a birthday gift. It holds a fine edge and I had it sharpened to a razor's edge. When I started the second side, front shoulder, the blade snapped through some sinew and cut through the end of my middle finger on my left hand, not clear through it but I almost took the whole tip off. This taught me my next lesson, if you leave your pack at camp, take your first-aid kit with you! That's right, mine was in camp, in my pack. All I had was a sock that I had slipped the camera in to protect the lens. I cut it into strips and wrapped it tightly around what was left of my finger. Needless to say, it took me a lot longer to bone out the rest of the elk.

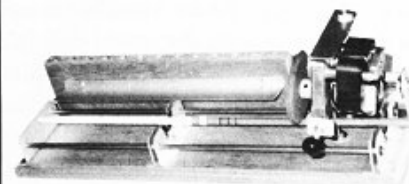
I was running out of daylight when I filled my fourth quarter bag with meat and started down with my first pack full. I was able to get two quarters down to the meadow in the Secluded

Valley and left number three and four in a tree where I had cut up the elk. The second trip out was nasty. Black as what I have already mentioned. With my extra flashlight now to the point of dimming completely out, I was standing in the Secluded Valley, in the dark of night

I left the first two bags at the edge of the meadow and started my long journey back to camp, exhausted, but never having felt better. Halfway to camp, across a large clearing, I saw a light coming my way. It turned out that Bob had stayed out until after dark hunting deer. I just couldn't wait to tell him every detail and how it all came about. When we finally met up, the first thing he noticed was the absence of my shirt! I explained how I had used it to cover the bags at the meadow. I don't mind saying that we were jumping, shouting and laughing. This was "my day" in The Dark Canyon of the Secluded Valley, my first elk.

This past May, we celebrated my mother's birthday with a dinner of elk backstrap smothered with freshly-picked morel mushrooms and chased it down with my wife Teresa's home-made wine! Oh for the bounty of the land! During

Arrow Crestor



- Hinged motor spins the arrow from the top
- Adjustable non-marring rollers
- Arrow and brush holders
- Cresting pattern holder
- All hardwood base with clear wood finish
- On/off switch
- 6-foot cord
- 300 R.P.M.

Mail check or call for more information



\$150

add \$10 for shipping & handling (WA. res. add 8.2% sales tax)

24928 S.E. 416th St.
Enumclaw, WA 98022
(360) 825-5910

the course of the meal, it only took a certain amount of begging and pleading to let me tell my story again (my family is so patient with me) "...as I readied my bow, Bob's words rang in my head, 'pick a spot Steve, PICK-A-SPOT'."



"NAKED INTO THE WILDERNESS"

PRIMITIVE WILDERNESS LIVING & SURVIVAL SKILLS

A working "How-to" manual written to enable anyone to become completely at home in the wilderness. **There is no other comparable book available. Period.** Each chapter was first written as a complete book in itself, all major subjects/skills one needs to know to be completely at home in the wilds is **illustrated step by step with words & photos to teach you "How-to"**. John & Geri well remember those little steps *left out of most instructions* that make things work - and they put them here for you.

---- The title says it all! ----

10 **COMPLETE** chapters cover in detail:

- Brain Tan Buckskin • Fire & Cordage • Bow & Arrow
- Traps & such • Cooking methods • Processing large game
- Containers • Pottery • Tools, making & using • Shelters

"... here is the place to learn." *Field & Stream*

• An Outdoor Life Book Club selection •

408 pages - over 700 photos 5 1/2 x 8 1/2 - paperback - **\$24.95**

To order, send
\$24.95 (postpaid) to:
or

Prairie Wolf - John & Geri McPherson
POB 96MS
Randolph, KS 66554

FOR FASTEST SERVICE CALL toll free 1-800-258-1232

"This is without doubt the best training guide for real primitive living skills"

Museum of the Fur Trade Quarterly.

THE EDWARD I LONGBOW SOCIETY

**Organized for English Longbow
Enthusiasts interested in medieval
archery and its history.**

**If you are interested in the history,
development, and impact of English
archery, please contact:**

The Edward I Longbow Society
5818 Marshall Foch St. New
Orleans, LA 70124 or phone
(504) 486-7149

THE LONG ELM BOW OF VEDBAEK

- A BEAUTY OF CRAFTSMANSHIP

By
Flemming Alrune



The lowlands of Northwestern Europe 5600 years BC, was a hunter's and a fisherman's paradise. The outline of the coast was more or less as we know it from maps of today. Sea and land had come to a balance after a long period of "rebirth troubles" after the last ice age. Dense forests covered most of the area, and as the trees conquered most of the land, people started to seek new hunting grounds—the coasts.

They were forced to do so due to lack of game in the dense and inaccessible woods. Big game such as aurochs, moose, and others withdrew to other habitats, leaving the woods to red deer, roe deer, and wild boar.

By moving from inland to coastal sites, the benefits gained were obvious. They simply enlarged their hunting grounds to cover the sea as well as the land. Three very generous types of habitats were at their disposal: The sea, the forest, and the land in between, all of them inhabited by game, birds, fish, sea mammals, fruits, and berries.

In a sheltered cove leading out to a fjord, a settlement was placed for that purpose. Their culture is named "Kongemose" after the location where it was first acknowl-

edged. This culture lasted for about 1000 years from 6500 BC to 5300 BC

The people lived a good and healthy life, which can be determined by the skeletons found during the excavation in the 1970s. The climate was a little warmer than today in Denmark, which means 2 to 3 degrees C higher in July. Game and seafood were plentiful, the population grew, and the site was able to feed generation after generation of hunters and fishermen.

During the 1970s yearly excavations were conducted at the site, and very remarkable finds were made. Graves with skeletons from both adults and children were exposed. One of the male skeletons has a special interest to the effect of an arrow (more about this in another article). Of course lots of flint, and remnants from producing tools of flint were excavated, but also a considerable amount of organic materials such as antler, bone, and of special interest to us bow people: WOOD.

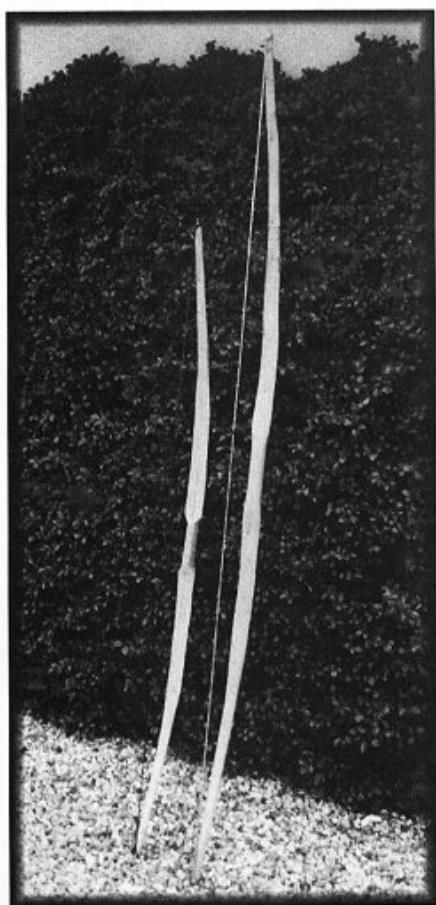
Four bows were excavated from the Vedbaek site, and two of them have been described. A short one no more than 4 feet long, and of poor quality due to a big and risky knot on one of the limbs. Two others have never, to my knowledge, been described so I'll concentrate on the one best preserved, best recorded, and most remarkable in the numerous row of finds from the Mesolithic Period, better known as the "Stone-age of Huntersty." It was found in 1977 and was

stuck down in the bottom of the fjord just outside the village, serving as a part of a fish trap. In other words a discarded bow. A long piece of wood from the backside of the bow had been "pressed" out, and was missing. A typical damage to a bow due to string break during drawing an arrow. This is the possible reason for discarding it. From the middle of the handle to the nock the find measured 97 cm, which makes the whole bow to be 194 cm. The "middle" of the handle has been estimated as well as the supposition of the two limbs being of equal length. It was a bowyer's dream of wood. Two meters of perfect elm wood. Not a twist of grain, no knots, no tricky parts to make a bowmaker seek other trades. Today such a piece of wood is rare in Denmark and lovers of elm wood are prepared to drive a long way to get it.

In the "Old days" of the hunters it might not have been that difficult to get such a piece of wood. The landscape of the island of Sealand was covered with trees of many species, among them elm. The find shows that the bow has been made from a small diameter trunk. The back of the bow was, as other finds from the period, done by the outmost year ring of the tree. The whole work to make it a bow, was done from the belly and the sides. The string was fastened 1.5 cm from the tip of each limb in grooves of both sides of the bow. These have been burnt in the bottom, maybe to make them stronger.

For many years, many arguments have been put in writing on the subject "was the back placed on the rounded part or on the flat part of the bow?" I shall only refer to the writings of Tim Baker and Errett Callahan on this issue. They agree with me in the conclusion that the back of the bow of course is the rounded part made by the youngest year ring.

In 1978 an arrow shaft was found. It was not like other finds from the period, which were made from split pine, birch, or shoots from hazel. This arrow shaft was made from a shoot from viburnum. The shaft was split in the front end, and must have been fitted with a transverse arrowhead of flint. These were found not with the shaft, but in other layers.



Left: Holmegaard - Right: Vedbaek

My reconstructed arrows are made from the above described species of wood, with flint points typical from the Kongemose Culture, which means both transverse as well as trapez shaped points. The latter being attached to the shaft so they had a sharp point in front.

Many very excellent books have been written on how to make wooden bows and I'll recommend reading those before re-doing the Vedbaek Bow, especially on the tillering process (the work that divides people into either "Bowyers" or "Bowyers to come"). Tillering those "Holmegaard Bows" is a time consuming process. The greatest care must be shown because of the design of the limbs at the narrowing part. I suggest the tiller be with a stiff handle and equally bending limbs all the way.

My reconstruction at 29" is 68 pounds with a string height of 6". A 500 grain arrow has a release velocity of 155 foot/sec. It is not very fast, which I think is caused by the extreme long limbs. Conclusion: It's not an efficient bow, but it's hard to overdraw.

We'll never find out of what these hunters used for string material. Probably sinew, rawhide, maybe plant fibers. I use sinew for display, and Irish Flax for hard work.

RECONSTRUCTING THE "BIG BOW FROM VEDBAEK"

It takes quite a long time to find an elm tree with the right diameter, straight for at least 225 cm of length, fairly free from branches and overgrown faults.

Many small diameter trunks were cut before a promising piece was ready. To make sure the trunk didn't warp or twist, it was cured for about a year.

DIMENSIONS OF THE TREE:

Length: 225 cm

Diameter at middle of trunk: 9.5 cm

Annual rings: 24

Estimated percentage of Early/Late wood: 25% early 75% late

The tools used:

Axe

Drawknife

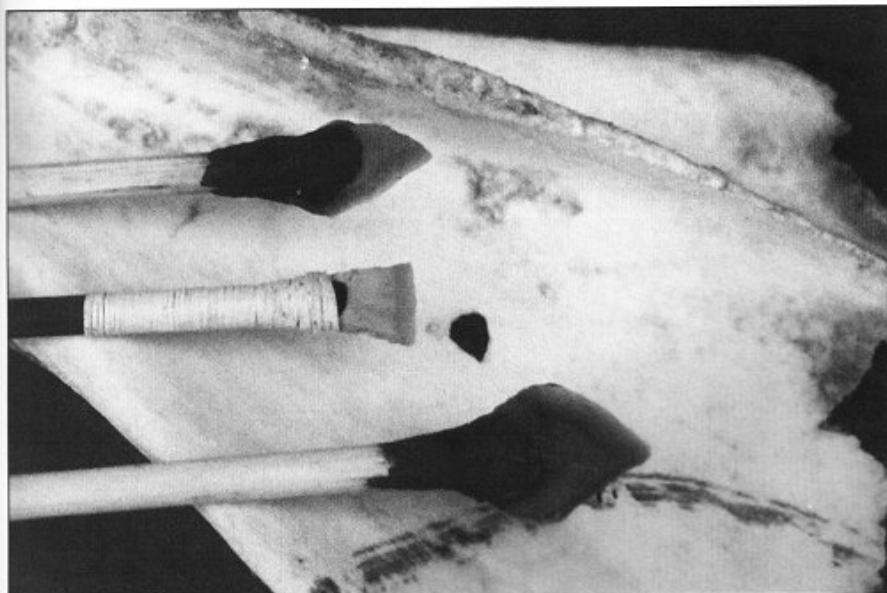
Knife

Flint scraper

Sandpaper

Different kinds of protection have been used on the bow, but because it passes through so many hands of the public during a year, it's now treated with linseed oil. Elm very often is a tricky and difficult wood to work because of the constant change of quality in wood even within a stave of 4 to 5 feet. That is one of reasons why I call my bows "Reconstructed Bows." They're true to length, width, and design but NOT to thickness, due to my intentions of making a workable bow.

The label of the bow must be "a longbow with a distinctive narrowed handle." The profile looking at the bow from the back is a fairly broad bow with distinctive narrowing on both limbs halfway between grip and tip. The cross-section at handle is almost circular. The limbs are elliptical with a higher arc on the back than on the belly. In Europe these bows are labeled "Holemegaard types" due to the design of the limbs.



Typical arrowheads from the Kongemose culture. Top: oblique flint; middle: transverse flint; bottom: oblique flint. In the background is a scapula from a full-grown cow penetrated with an oblique-shaped arrowhead from 20 meters with the Vedbaek bow.

"Why such a long bow?" I get that question every time I give lessons to people in Denmark. I don't know, because they had no reason to do so. Other bows from that long period of time measured between 154 cm to about 180 cm. The average height of the male skeletons found was 171 cm, which means a draw length of approximately 28 to 29".

Maybe it's a bow of prestige. A masterpiece of bowmaking done either by the owner or to a man holding an important position in the village.



Author's Note:

Denmark, the northern part of Germany and the southern part of Sweden each have in many areas a soil which enables organic remnants to be preserved for

archaeological excavations, a gift from the Gods.

The next article will tell about an underwater excavation of an area that was settled for more than 1,000 years. It yielded 10 bows, and this time of different design.

REFERENCES:
VÆDBAKPROJEKTET, HERNING 1979, VARIOUS WRITERS

NEOLITHIC BOWS FROM SOMERSET, ENGLAND AND THE PREHISTORY OF ARCHERY IN NORTH-WESTERN EUROPE, BY J.G.D. CLARK 1963

HEATHEN ARMS



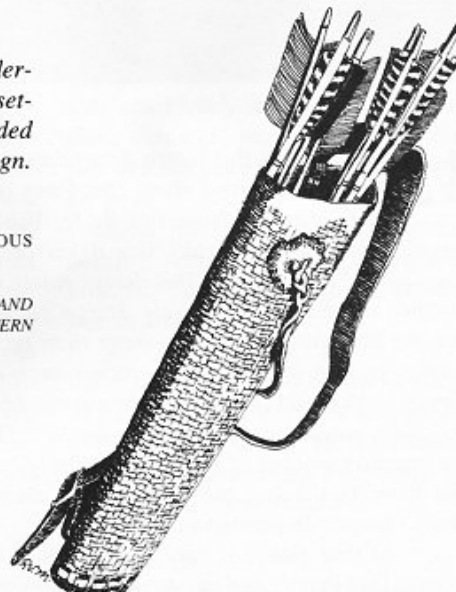
Primitive Bows
Arrows and
Bowmaking Supplies

BOWMAKING WORKSHOPS



Send \$3 for brochure, or call
Hari Heath, Bowyer
(208) 245-5124
Box 126 Santa, ID 83866

SINCE 5,000 B.C.



THE SNOWCRAFT "FAMILY" OF TRADITIONAL BOW QUIVERS

BROCHURE AVAILABLE



SNOWCRAFT

1961 Campground Road
Hastings, Michigan 49058

(616) 945-2238 FAX (616) 948-9160

TWIG ARCHERY

NEW INTRODUCES NEW
CHUNDOO WOOD ARROW SHAFTING

IF HOWARD HILL, FRED BEAR OR BEN PEARSON COULD HAVE GOTTEN IT, THEY SURELY WOULD HAVE USED IT. STRAIGHT AS CEDAR, STRONGER AND TIGHTER GRAIN THAN CEDAR, 20-30 GRAINS HEAVIER THAN CEDAR FOR BETTER PENETRATION, A SMOOTH FINISH. IT EVEN COSTS LESS THAN CEDAR!! WHAT MORE COULD YOU ASK FOR IN A WOOD SHAFT??? WE ALSO CARRY "PASS-THRU" HARDWOOD, MAPLE, PINE & CEDAR.

BACK QUIVERS, SNAKESKINS, & ARROW BUILDING SUPPLIES. FREE BROCHURE. **TWIG ARCHERY**, 45194 TR 432 CONESVILLE OH 43811. (614) 829-2847 PHONE HOURS M-F 4-8 PM SAT. 9-5 PM

INTERVIEW: DAN PERRY

by Paul Comstock



Most of us in the North American natural-archery scene first learned about Dan Perry of Salem, Utah, in *Traditional Bowyer's Bible, Volume III*. In his chapter, "Bows of the World," Tim Baker described "A new design—*The Perry Reflex: This design raises wood bow performance more than any single design element developed since the beginning of archery more than recurving, sinew-backing, or natural, heat-bent, or set-back reflexing. Dan Perry of Utah makes bows of bamboo-backed hickory that are faster than any all-wood bows I've tested.*" Those sentences are a stunning amount of praise, particularly considering they come from Tim Baker, the man justly acclaimed as natural archery's master diagnostician.

At first glance it may be difficult to understand the fuss over Dan Perry's design. Aren't all reflex bows the same? They are not. More than anything else, such confusion is testament to Perry's innovative thinking that produced the design in the first place. The Perry reflex is not like any other reflexed bow.

Let's look at the differences:

A normal unbacked reflexed bow—whether steamed or naturally reflexed—will lose at least 1.5 or 2 inches of its reflex, when comparing the pre-tillered bow after it is broken in. When pulled at full draw, this bow will always be experiencing greater levels of tension and compression on the back and belly when compared to a same-specification straight bow, since the reflexed limbs are traveling farther.

A Perry reflexed bow is different not because it is backed with hickory or bamboo, and not because it is reflexed. It is different because the belly wood is essentially tillered in a reflexed position before the backing is glued on. As Baker explains at length in TBB III, this allows the glued interior surfaces to store energy, reducing the amount of work to be done by the back and belly, and allowing the bowyers to significantly reduce the mass of the limbs. The result:

The Perry reflex will lose about 0.5 inch of reflex, if that, comparing the pre-tillered bow to the bow after it is broken in. The back and belly are under less tension and compression, increasing durability. The Perry reflex is, if tapered correctly, guaranteed to have less limb mass than a normally reflexed bow, and will shoot faster. Osage and yew are also good belly-wood candidates for the design.

Perry considers himself mainly a flight shooter and holds several flight records for bows using all natural materials. He designed the Perry reflex (which he now sells) originally for flight shooting and would rather talk about flight shooting than any other aspect of archery. He calls the promotion of flight shooting his main mission at the moment, and wants to see it encouraged around the U.S.

Perry thinks natural archery can revive flight shooting. By promoting natural archery flight shooting, Perry says the sport will not require 2,000 yard ranges needed to compete with the latest in high-tech equipment, which is difficult to obtain and potentially hazardous to use.

Perry's bowmaking career began in high school, and his first bows used fiberglass. His wife, Gwen, is not only supportive of his archery efforts, but she out shot him the first time they ever went stumpshooting together. They have five children.

How did you get involved in flight archery?

I started making old fashioned wood bows in the Indian style, backed with sinew and I wanted to see how well I was making them, what kind of energy they were producing, and how far they would shoot. Then it became some kind of grudge match because I had a friend, Don Burge, who was making bows at the same time. We were shooting clout. At first we couldn't put the target very far away so we'd go back to the drawing board to make a faster primitive bow. Then we kept pushing the target out and it got to where we were trying to shoot farther than the other guy and it became a lot of fun.

You started moving into longer bows later, correct?

Yeah, I started experimenting with all types of wood bows when I got into college. I got a scholarship at the College of Eastern Utah. A good friend of mine there who is the head of the geology department, Don Burge, was also interested in the history of archery. He had been shooting since the time when all bows were made of wood. He encouraged me and he was making wood bows when I got there. Don is still curator of the college museum, and is the one who discovered the Utah raptor dinosaur. He's been all over the U.S., touring and lecturing on it.

Tell me how the Perry reflex bow got its start.

The problem with the sinew-backed bows was that they took so long to cure and the sinew added so much moisture to the hickory. And I hated sinewing. I was looking for a different way to improve a bow's performance without having to sinew back it.

I was playing around with some bamboo laminations. I made a bow out of two bamboo pieces. I figured maybe I could

just flex it backward and keep some reflex in it. The idea was a disaster. Once I cut through the hard outside shell on the belly to tiller it, I had a pithy weak bamboo under compression and it followed the string horribly. The next one I made was a longbow that had three bamboo laminations, but it was reflexed three inches and it held its form really well. It was a pretty fast bow but I had some other design problems early in my career. It bent too much near the riser and ended up breaking. Because the bamboo was breaking, I decided to use a hardwood so I could tiller it. I settled on hickory simply because it was available and very tough. I developed a real love affair with hickory.

Isn't it true that the trick is to basically tiller the hickory belly before gluing it up?

Yeah, but I didn't start that way. All this evolved kind of slowly. If I didn't pay attention to whether the limbs were the same strength when I glued it up, I would find that even though the limbs were forced into the same amount of reflex, one limb was thicker than the other when the bow was finished, so it was lopsided. It made tillering kind of squirrely. When you have one limb deflexed, after you've shot it awhile, it really goofs it up. To save myself a headache, I get them to the same thickness and floor tiller them correctly. That way I get a nice uniform shape to the limbs.

NEW
Custom Recurves
by Bob Lee
& Dale Stahl

Jim & Marcia Rebuck

Custom
Long Bows by
Dale Stahl &
Susq. Archery

J & M Traditions



ALL
Traditional Supplies
Recurves
Long Bows
New & Used

R.D. #2, Box 413
Sunbury, PA 17801
(717) 286-7887

Flemish Strings
Custom Arrows
Aluminum
or
Cedar

Its a very difficult bow to make and my first attempts weren't the greatest. It probably wasn't until 1987 that I did enough experimenting with it to realize how much faster it was than even a good yew, Osage or dried-out hickory bow. Originally, the limb tips were 5/8ths inch wide. The bows kept their reflex, but they weren't all that fast.

Reducing the width at the tips down to 3/8ths of an inch, it's surprising how much more velocity you can get. The first really good Perry reflexes were in 1987, and a lot of it was just fine-tuning.

You have either revived something that was completely lost or created something that was completely new. I think you are an innovator in this respect. Do you?

I'm confident this design was used before. We just don't know when and how. Its very hard to create something new in archery.

I had family members who told me not to go public with it. They told me people were going to steal it. I told them I didn't care because I had more bow orders than I could build.

WOODEN BOWS

From Ash to Zebrawood. Ancient, Traditional, and Current Designs. Smooth, Fast, and Durable.

Quick Delivery

PAUL RODGERS

(510) 634-1835

Before I started talking to Tim Baker about it, I didn't think anyone in the whole world cared.

Tim said it was putting the back and belly surfaces under reverse stresses. I called him back after I thought about it. I got the idea at school. I noticed that when you take a book and curl the pages, the ones on the inside extended out farther. If you pinch them together and don't allow them to slip, they would stay in that position and it took quite a bit of force to move it back.

That was the idea of where I was trying to store the energy. I wasn't sure it was storing there but it was my theory. Tim thought it over and said "That's exactly how it's working."

He came up with a lot of additional theories on his own. Like how he could use it for excessive reflexing and stuff. That was never my concern. I was trying to get a little more velocity per pound of draw weight.

You've been selling them for how long?
I started offering them for commercial sale in 1991 or 1992.

What are the main things you try to tell your customers?

First of all, a wooden bow is not fiberglass. I flat out tell them that wood won't take the same stresses that fiberglass will. You can't stress it to the same level, so you have to pay a little more attention to what you are doing to your bow. And that starts with design. You just can't take a wooden bow and have one size fit in all draw lengths and draw weights.

Usually what they want is a very short bow with a very long draw length and a very heavy draw weight. And I have to bring them down to reality. That's not the best combination for longevity.

Are the customers of 1996 more knowledgeable than the customer of 1991?

Oh, yeah. I spend more of my time teaching people over the phone how to make their own bows than I do trying to sell bows.

That's been my goal the last couple of years. Since I'm busier than I want to be making bows, I'm trying to teach people to make their own bows. They are much more knowledgeable. I find they've read a lot. I can't believe the number of people who have read *The Traditional Bowyer's Bible* series.

They already know about me. They know about my designs.

What sort of bows do these people want to make?

Everyone still wants to make Osage bows. I don't like to make Osage and yew bows. I like to make hickory bows because it is available. I can get good quality hickory much easier than I can get good quality yew and Osage. Most of them can't believe the performance possible with a good, dried-out hickory bow. It's not that hickory is the inferior wood it was always made out to be. It's that the people didn't understand that hickory stayed wet back east and it followed the string. But if they dried it out, it was fine.

Even in my dry desert climate, you had to wait forever on a sinew-backed hickory bow before you could shoot it. It looked dry, but it took a long time for moisture to get out of one after you sinewed it.

You had a wet noodle for a long time. It was depressing when sinew was supposed to make a bow shoot farther than before you sinewed it, and a month later it didn't shoot as far and followed the string more because of the moisture.

What else have you been into?

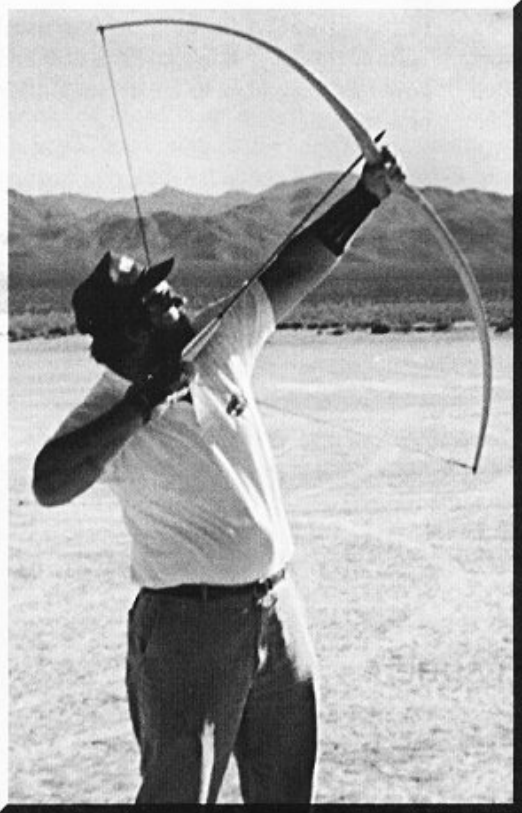
I started the Wood Bow Club of Utah last April. Our main emphasis is to teach people how to build their own wooden bows and related tackle.

Building a good flight arrow must be a real trick. Tell me about that.

At least half the battle is getting an arrow that is light enough but won't lose the energy the bow has. Building the arrow is very tricky. It's not uncommon for your worst arrows to outperform your best arrows. For the shaft, my first choice is lodgepole pine, and then Douglas fir and Port Orford cedar. Sometimes, because the cedar is so light, the diameter will be too large, creating too much air resistance. The fun thing about broadhead flight archery is you gain usable data for hunting bows. This is shooting legal hunting arrows for distance. They have to have full fletching and they have to be heavyweight. More than any other factor, that's what molded my Perry reflex design. I never intended to sell it to the public. I was going to keep it secret. It was going to be my ace in the hole if anyone started crowding me at flight competitions.

Natural archery has grown a lot in the past five years. Will it grow more?

Oh, yeah. I think people turn to natural archery simply because people like wood. Look at homes, people spend a lot of money to use wood floors because wood is beautiful. Man forever has had this obsession with wood. The simplicity of natural archery attracts a lot of people but I think people just enjoy how beautiful and artistic a wood bow can be.



RAMBLING ON THE LONGBOW

AN ARCHER'S MECCA —PART 1



By Roy King

Reprinted from an article previously appearing in *British Archer*, Vol. 30, No. 3.

After some years providing shooting equipment for members of the Queen's Body Guard, the Royal Company of Archers (RCA), it was with great pleasure that my wife, children and I accepted the offer of the Company to stay at Archer's Hall, their Edinburgh home. The purpose of this visit (four days) was for me to teach Mr. J. D. E. Moir, the New Company Officer, a little about the maintenance and repair of wooden traditional shooting equipment of the Company.

It would, however, be best to first describe Archer's Hall itself, so that the reader can fully appreciate this Archer's Mecca and its position in Scottish archery.

Since their official foundation in 1676 the RCA have always been associated with Edinburgh, although strangely enough for the first 100 years of their existence they had no permanent home of their own, meetings, etc., being held in local taverns. Due to the healthy and prosperous condition of the society by 1776, it was proposed that the Royal Company should establish a rendezvous and social centre of its own, as a brief entry in the minutes of 22nd June record: *"The council having resolved upon building a proper hall for the meetings of the Company to be held in, a voluntary subscription was begun this day for that purpose."*

The foundation stone was laid on 16th August by Brigadier General St. Blair of Rostin. Work proceeded so rapidly that within 9 months, on 24th May 1777, the members were able to dine in one of the so-called "parlours."

The Archer's Hall of these days was not, of course, the Archer's Hall we know today. There was a hall, itself 40 feet long, 23 feet wide and 14 feet high, with a musician's

gallery, (now the present dining hall on the first floor). There were also two bar-rooms two parlours and various domestic offices.

The site of the Hall at the time was criticized, being set in the country somewhat remotely from the centre of social life, mainly around Castle Rock. Still the RCA were content with their choice of site, for the new Hall which adjoined their principal shooting ground, situated in the East Meadows, was by no means an unpleasant place to spend a summer afternoon, being in the country and quite removed from the overcrowded and not over clean, Old Town. The tavern atmosphere though was not eliminated from the Hall, because as soon as it was built, it was sub-let as a tavern with certain rooms reserved for members of the RCA.

With the growing importance and prestige of the Queen's Body Guard, it was agreed in 1899 to rebuild Archer's Hall in a manner befitting the Society. The present admirable building is the result.

The building stands at the corner of Buccleuch Street and Meadow Lane. Not far away from its front face runs the main road from Edinburgh to the south; to the rear lies the bowling green, with the indoor Butts and bowyer's shop. Beyond that the East Meadows, where for many years the Royal Company shot at clouts at ranges on nine to ten score yards, together with target shooting at 100 yards.

The Edinburgh Bowling Club have been tenants of the Royal Company since 1848 and are the principle bowling club in Edinburgh. In 1934 they erected their own pavilion

Photo: Archers' Hall from the rear.



Mr. J.D.E. Moir and Roy King
at the entrance to the Archers' Hall.

adjacent to the green, in which to store their gear and retire. However, at certain times they have to relinquish their tenancy so that Royal Company members can indulge in a game of bowls, mainly after a March Dinner has been held in Archer's Hall.

The interior of the Hall itself radiates friendliness and warmth; everything is on a human scale, imposing but not overpowering. The feeling generated is one of continuation from past to present. The most important apartment in the Hall itself is the Dining Hall upon the first floor, its outstanding features are its portraits, mainly of past Officers and a magnificent chandelier which is worthy of further note.

In 1899 while Archer's Hall was being rebuilt, Sir Oliver Riddell, a benefactor to the Royal Company, desired to make a gift to the Company to mark this important time in their history. The leading Scottish architect of the day, Sir Robert Anderson, suggested a replica of a chandelier of the Louis Quatorze period, having a particular one in mind. It hung in the dining room of a chateau once occupied by the Emperor Napoleon in the neighbourhood of Compagne. In due course a representative of an Edinburgh firm of metal workers was sent off to France to draw and measure the original. Eventually the chandelier was finished, after much painstaking work, in gilded metal and glass-crystal at a cost of 700 pounds.

Of those portraits that hang in the Dining Hall, perhaps the two best known to the outside world are those of Dr. Nathaniel Spens, Raeburn's masterpiece and William St. Blair of Roslin.

The latter picture is remarkable in that it portrays an 18th century archer, armed not with a bow but with a golf club! The portrait, originally painted by Sir George Chalmers for Honourable Company of Edinburgh Golfers (they wrote the first "rules of golf"), was purchased by a member of the Royal Company when that distinguished institution fell into financial difficulties in 1831.

When material prosperity returned to the Honourable Company they were given permission by the Royal Company to

have a copy of the original painting completed, for no price would make the Royal Company part with the original. This was done in 1909 and so much alike were the two paintings with identical frames that concern was evinced as to which was the original. Ultimately the original was returned to Archer's Hall and the copy dispatched to the Honourable Company.

Descending the staircase to the entrance hall, more interesting relics of bygone archery grace the walls. The first of these is the Rodendo, a handsome embroidered cushion of green velvet upon which the customary "pair" of barbed arrows. A Rodendo is an archer's pair (three) of arrows, which are presented upon request of the Monarch, the tradition dating back to institution of the charter given by Queen Anne in 1704. The Rodendo in the Hall was presented in 1905 to Edward VII and later presented to Archer's Hall by George VI. Eleven Rodendos have been presented in all. When Queen Elizabeth came to Scotland on her State visit after the coronation in 1953, the Archers gave her a diamond brooch with three arrows on it.

To archers perhaps the most interesting item in Archer's Hall is the glass case of old bows that hangs halfway down the staircase. Six much valued bows of the Company are housed here. One's immediate attention is drawn to the knotted, knobby stick, reputedly a relic from the battle of Flodden 1504. The bow shows no sign of handle nor configuration of design that would indicate where it should be held. In all, it is a slightly tapered stick of a cross section that can only be described as square,

unlike the accredited "D" section of what is regarded as the traditional shape of the longbow. The other five bows in the case are of the "D" section. The square section alters only a few inches from the extreme tips where it changes to a conical taper. The bow is 70 inches long, more or less, and certainly of its assessed weight of 80-90 lbs. The 20 or so small pins in the stave are sharply raised on back and belly, giving a wart like appearance, more in keeping with a walking stick than a formidable weapon.

A second bow, much-valued memento of the early association of the Royal Company and the Woodmen of Arden, was presented by the Earl of Aylesford, Lord Warden of the Woodmen, upon occasion of his being received into the Royal Company in 1788. It is a conventional six-foot yew but its girth indicates a draw weight as high as the Flodden bow. However, appearances can be deceptive and it may have pulled nearer to 60 lbs.

A third curiosity is a yew bow backed with a thin strip of ash dating from 1650, being as pin ridden as the Flodden bow and raised in identical manner. Compared to the two mentioned bows it is a frail, weak article probably not above 50 lbs as are the three other remaining bows.

Let us supply you
with the best... go to discount stores
for the rest!

FEDORA

KRAMER

LONE PINE

ASSENHEIMER

HOWARD HILL

MARTIN


STEWART

QUILLIAN

GREAT PLAINS


BOIS D'ARC BOW CO.
(Self-bows)

Custom Cedar & Aluminum Arrows




GREEN
Traditional Archery

313 Trexler Ave., Dept TB
Kutztown, PA 19530
(610) 683-7961



Catalog
\$2.00 Refundable
with first order



Two remaining yew bows were presented by Dr. Spans in 1840. Each being regarded for the perfection of its yew, though they appear by now-accepted standards as nothing out of the ordinary. This gives me the impression that bows of 17th and 18th century were probably made of British yew rather than the straighter and less knotty growth of imported European wood. Note I do not say tighter grained, as British yew growing in good conditions for bowmaking can be found with a very tight grain. However, such was the quality and workmanship of one of these bows by Grant, that in 1788 Lord Aylesford is said to have offered 50 guineas for it; the offer was declined!!

The last example of the bowmaker's art is an 18th century early example of a backed fustic-wood bow. Of small proportion it appears to be only 45 or 50 lbs.

In the entrance hall are displayed old archery uniforms in glass cases. One of 1713 is composed entirely of tartan, with a white belt and white puffed sleeves. The breeches are also puffed in the same odd way. The second is the field uniform of a type in use when George IV paid his visit in 1822. It is all tartan trews with a silver stripe, and a voluminous frock coat with puffed sleeves and a white ruff. The third is a handsome mess coat of the same period of Archer-green cloth, buttoning right up to the throat, with brass buttons and high velvet collar. The last is a seamlet dress coat designed by George IV in 1825. The high black collar is decorated with an ornate gift thistle design, with two crossed arrows on either side. The red leather belt too is interwoven with a design of gilt arrows. The epaulets are large and heavy with three crossed arrows on each. The coat was worn with a white "cashmere" waistcoat and breeches, white silk stocking, shoes, and buckles; alternatively pantaloons and Hessian boots could be worn.

Also displayed are a pair of white leather gloves of treasured interest, with embroidered backs, worn by Sir Walter Scott when attired as a Royal Archer.

A last bow lies along the centre of a large table in the council room. Of crude yew it is stamped 1834 on the

belly just below the handle. The curiosity of this bow is the "U" bend as sharp as a bent walking stick handle just above the grip of the top limb.

The treasures and trophies of the Society are housed in a very strong, strong room! Pride of place must go to the Musselburgh Arrow (1603); this 10 inch long silver arrow is the oldest sporting trophy in the world, to which successive winners have added a silver medal suitably engraved. By 1713 the arrow became so lost amongst these medals that a new arrow was presented by the winner in that year.

The Edinburgh Arrow of 1709 is a massive trophy almost head high in its storage box. It consists of an enormous fancy plinth into which vertically stands the arrow. Firmly around this spirals a thick silver wire held in place by supporting uprights, spreading out to some 18 inches at the base. Attached to this spiralled wire are the winners medals with only the occasional one missing through the war years.

The prize of the Treasurer's Bow is a bow made by Muir in self yew with silver handle, horns, and string. In this case winners medals are attached to the bowstring.

The Silver Bowl prize of 1720 has its medals attached around the brim, and though it seldom holds its intended brew of punch, it has occasionally been brought into service as a "christening bowl" for the infant offspring of the Royal Archers. Its value in 1878 was put at 2,000 pounds.

British Archer Vol 29 No. 6 gives the dates and names of other trophies of the company, in my first article on the Royal Company of Archers. They are too numerous to repeat here but sufficient to say that they form an incredible and unique collection of archery heritage, all of which is documented in many books of the Company's records, also held in the strong room. All but the most recent of these books are written in old copperplate handwriting. Many curious entries are made and a brief flip through the pages shows entries such as years salary to John—10 guineas and a goose, the latter no doubt being in a Christmas box.


Now, and at last, to my being at Archer's Hall. As initially mentioned, I



Hunters Rendezvous
Traditional Archery & Muzzleloading Supply Post
Largest & Best Stocked Store in New England
 Custom-Made Longbows, Recurves, Custom Cedar Arrows & Accessories.
 Over 100 Custom Bows in Stock at All Times.
 Antique, Reproduction & Custom Muzzleloading Firearms.
 Largest Selection of Custom-Made Muzzleloading Rifles in New England.
 Barrels for T.C. Hawken & Renegade.
 Handcrafted Authentic Accoutrements.
 Buckskin Clothing • Dealer for Shiloh Sharps
When In New England, Stop By And See Our Store.
 Rte. 119 (South Road)
 Pepperell, Massachusetts 01463
 (508) 433-9458 • Fed. Lic. #05976
 Exit 31 Off Rte. 495, 11 Miles West On Rte. 119 - Look For The Log Cabin

was there to give a little assistance to the new Company Officer Mr. J. D. E. Moir, to show him the basics of wooden equipment. For strangely enough after three years in the Navy and 22 years in the Gordon Highlanders "Jim" had never shot an arrow in defense of the realm!

The WOODSHED




Hi. Let me introduce you to the WOODSHED.

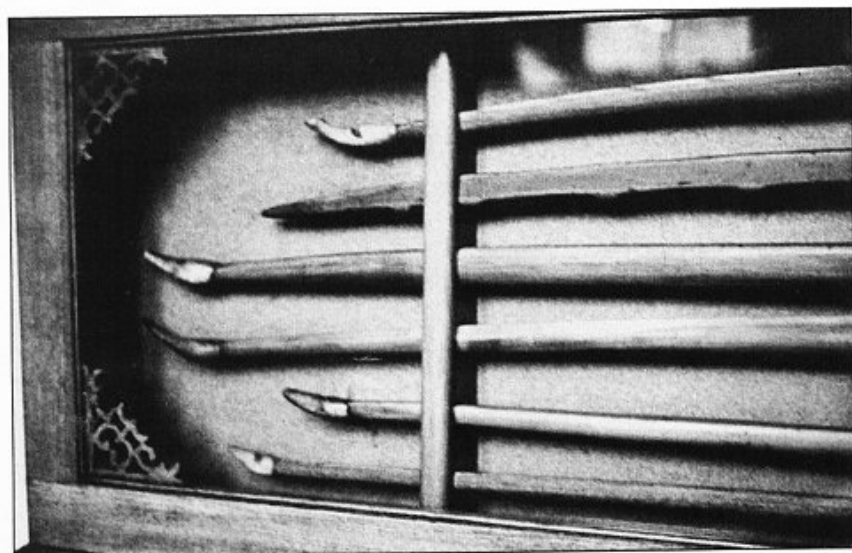
First, we have one of the best selections of archery woods available for bowyers. We purchase quality woods in quantities to get volume discounts, which means savings to you.

Second, we are able to produce LAMINATIONS to your specifications. Our custom lamination forms were milled to precise standards, which mean repeatable high quality laminations for you.

Third, shop around, compare prices and quality, then give us a try. Your satisfaction is guaranteed!

The WOODSHED
 P.O. Box 1274
 Meridian, ID 83860-1274
 (208) 887-9297





Bows in display case. The top bow being dated 1650, and below it the knobby square-sectioned "Flodden Bow" of 1513.

Now a retired RSM, Jim has taken up his new post along with his wife, Isabelle, to see to the smooth running of Archer's Hall; organizing Mess dinners for 70 or 80 members at a time though is no easy or enviable task. Fortunately Jim says that Her Majesty isn't coming to dine at Archer's Hall in his first year, and no doubt he feels that he naturally needs a little practice at such occasions before she arrives! On such large occasions the Company's trophies are brought into play, providing a focal point to the centre of the well laid tables, all with appropriately crested knives, forks, plates, glasses, etc. All must be perfect from start to finish, the conclusion usually being the tables swept aside and a game of carpet bowls being held. Though only a few of the 400 members actually shoot-in-the-longbow, mass dinners are well attended.

The most interesting thing about Archer's Hall is the chance of a new discovery. Jim tells me he is only just beginning to find his way around, unearthing odds and ends in storerooms, cupboards and attics. Indeed, passing through the attic on the way to sample the view of Edinburgh from the roof, I couldn't help but notice a very dusty and dirty pile of bows and arrows. Obviously long forgotten, the bows hailed from other lands. Two large Chinese composites took up most space, with their miniature javelins that could loosely be termed arrows. They were

fully 38 inches long, 1/2 inch in diameter and with the full length and height fletchings, though a little moth eaten, still 10 inches long. A good number of "primitive" bows littered the attic but under these were hidden two gems, a couple of the finest Indo-Persian bows that ever drew an arrow.

A few hours one evening with Brillo pads brought out the full beauty of these pearls of the east. Before this work the bows were thick with dirt and grime, showing not a hint of their true beauty. One of the basic pale brown and gold leaf being covered in designs, principally of flowers and foliage, hiding in which were exotic peacock-like birds. Around the recurved part of the limb and towards the ears, the designs changed to a type of silver gilt, overpainted again with an involved design of flowers. The other bow was of green and gold, being a regular and beautiful pattern painfully and deliberately applied to the limbs, so that only the most active parts of the limbs were left bare. Such bows were obviously made for a person of high rank and must have taken weeks in designing and applying the intricate patterns. Just by chance two matching arrows to these bows were found in the bowyer's shop. As pure guesswork I would say that the bows were 200 or 300 years old and are certainly now nearer Mecca (archer's Mecca that is) than when they were made in the world of Islam.



Indo-Persian bow found in the attic of "Archers' Hall."

I WAS A COMPOUND JUNKIE



b
y
B
o
b
S
o
l
i
m
e
n
a

Yes folks, I was a "Compound Junkie!!!!" I can admit that now because I've converted to the traditional style of archery. This transition seemed abrupt, but it actually started two seasons ago while I was hunting elk in Northwestern Colorado with Jim Walz of Walz Guide and Outfitting Service using a 62 lb compound bow. I was using fingers, with cross hair sights and a string peep at the time. It was successful for me. Then however, I got into a situation on that hunt that would change my attitude and style of bowhunting forever.

Here's what happened—Justin, Jim's son, was bugling at a nice 5x5 bull who was looking in my direction from across a steep draw below. I tried desperately to blend with the trees. It's tough doing that; trees and humans don't even look alike, Ha!! Ha!! The bull had a bead on my location and the dimming light made the situation more pressing. So, I waited till the elk's attention shifted to the bugling sound behind me before I dashed off toward a clearing on a hillside in an attempt to cut him off. As I got into position the elk turned his attention back to the path he was traveling before he was so rudely interrupted. I

could see that he would now be coming in my direction. When the bull got to about 45 or 50 yards he spotted me and bolted. In a desperate attempt to lure him in, I started to make noise and rub a branch on a small oak tree nearby. He got curious and came around for a look but never close enough for a shot before bolting off again. I stepped up my effort at playing a rival by racing in his direction and grabbing the nearest tree trunk and shaking it wildly. He came around again to see what was making the ruckus then trotted off. We played this game for a while as Justin looked on in amazement. It was quite a scene.

During one of these intimidating encounters I was able to get within about 30 yards of this fine specimen, but the day now had turned to that last bit of twilight that made the bull look silhouetted against the fading light. In a desperate attempt I drew the bow but could not see the cross hairs through the peep. "Damn!!!" I even raised the front of my bow into the sky above his back in an attempt to line up the peep with the 30 yard cross hair. As soon as I brought the bow back to the elk I lost the front sight altogether. Just then the elk got tired of this game and bounded off in a hurry never to be seen again.

By the time I got back to Justin it was 8:30 p.m. and darkness had its hold on the night. I was so frustrated. The opportunity for a shot had come so late in the evening and when it did, I couldn't use the sights. "That's hunting," I thought. But, true as that statement was, it still bugged me that I couldn't see the sights in the fading light.

Back then I hadn't shot Traditional archery and didn't know any better. But, now I realize that if I had been hunting with a longbow and shot instinctively I certainly would have been able to make a reasonable shot at that bull. The sights only hindered me in that situation and, as I look back on other past bowhunting experiences I can picture many, many potential opportuni-

ties that I didn't even consider. So, last season I started shooting a longbow instinctively.

Bowhunting situations are unpredictable and one never knows where or when an animal will appear within range. Sometimes there is only one chance for a shot and you're not in the best position to line up peep sight and pins or cross hairs, or the lighting is poor like on my elk hunt. Whatever the case may be, with traditional archery a lot of those situations would allow for opportunities to get off a quick accurate shot.

With practice, a person shooting instinctively can learn to shoot from various awkward positions, or under poor light conditions and make killing shots where sight aids would be useless. Additionally, shooting targets/birds out of the air can be done with more assurance and speed. All this expands the versatility of the bow and increases the joy of archery.

As I practice shooting instinctively I get better and have more fun than ever before. And FUN is one of the most important aspects of the sport of bowhunting. Not that other forms of shooting archery are wrong, but for me instinctive shooting is originally how archery was done and that puts me closer to my ancestors' ways. No other style or

type of archery shooting compares to the feeling of accomplishment one gets when he/she hits "The Mark" without the use of peeps or sights. It never ceases to amaze me how the brain coupled with hand-eye coordination and consistent and repetitive practice can result in accurate arrow placement.

The traditional bow I bought is a custom three-piece (yes, THREE-piece) break-down Elite Longbow from Stotler Archery of Oregon. It's custom made to my draw length of 27-1/2" and has a 52# draw weight. The bow comes in a carrying case and when I first opened it I was immediately struck by its beauty and fine elegance. Since I have owned it, the bow has performed flawlessly and with unparalleled consistency, accuracy, and no hand shock. It's a joy to shoot.

So, now I've moved up to traditional archery and plan to have many years of fun and pleasure shooting this

Christian Bowhunters of America

Exalting Christ

Creator! Saviour! Lord!


For membership information or to inquire about spiritual matters, write:

CBA • 3460 W. 13th St. • Cadillac, MI 49601

Genesis 1:1
John 3:16
Matthew 5:16



SOUTHWEST BOW CO.



Bowyer, John Bowden
(619) 347-0342

P.O. Box 761
Indio, CA 92202

way. In fact, on January 5, 1995, on the first day of an Arizona javelina hunt, I shot one of these critters at 15 yards. It was a perfect shot. I was at the edge of a clearing in anticipation of intercepting some feeding javelina I had spotted 200 yards away. It was a perfect ambush and the first javelina to appear in the clearing grunted as it darted from behind a cactus bush. He was so quick I had no time to think. I just drew, came to anchor, swung with him and released, all in one movement. Something I could never have done with my compound. Unfortunately, my arrow was a foot behind the fleeing prey. A split second after the arrow bounced off a rock, I heard the whoof-whoof of another javelina as I immediately knocked another arrow. The same thing happened again. As I was swearing to myself for missing, I heard the whoof-whoof of another javelina. This javelina was standing under a tree directly in front of me about 15 yards. I immediately removed another cedar arrow from its spot on the quiver, knocked it, and drew to my anchor. When the javelina turned broadside, I relaxed my fingers and loosed the arrow. Before the javelina could take another step the broadhead hit its mark. All hell broke loose as the rest of the herd scattered for safety. But it was too late. The heart shot was devastating. It was the most thrilling moment of my bowhunting career.

Even though the first two shots missed, I couldn't have even thought about shooting in that situation if I had been using my sighted compound. With more practice, I hope to become more proficient with the longbow to make those tough shots count. In the meantime, it's fun to practice and keep improving.

For those of you reading this who are still "compound junkies" don't fret, there is still hope. For all you have to do is have the courage to take the first step to instinctive shooting and free yourself from the bonds of the high-tech world. Take it from me, it will be worth it.

Now, there may be some of you reading this and saying to yourself, "*but I love my compound.*" You are the hard-core "junkies." To that I say take heart in knowing that you can transition yourself off modern equipment more slowly than I did. First, try removing the sights and any string-peep aids and shoot bare bow at close range. Then, when you see that you can hit what you aim at pretty regularly, try removing the arrow rest and shooting off the shelf. (This will require changing your fletching from plastic vanes to feathers to get the proper arrow flight.)

I know many good shooters that consistently shoot high scores this way. A few of you who really won't give up that favorite compound may decide to keep this as your choice of shooting style. But for the rest, the next logical step will be to one day get a recurve or a longbow and make that leap to traditional archery. It will open up a new and exciting world filled with the beauty of fine, hand-crafted bows of yew, bamboo, Mexican rosewood, or other exotic combinations. Believe me, it will spark some inner feelings of a primitive epoch that is still in all of us.

Whichever you choose, your love of archery will grow that much more.



Author's Note: As an aid to learning to shoot instinctively, I recommend reading "*Hit the Mark*" by Paul Comstock.

SUNDOWN PRODUCTS

Deer Leg Sinew (whole and processed)

Rawhide (whole and strips)

Hide Glue

Back Sinew

Beaver Silencers

And MORE!

Call or Write for Price List

Charles Homitz
34 Meyers Road
Washington, PA 15301
(412) 222-5861

"PULLING BIG BOWS"

—The first in a series of videos on "Archery Fitness." Train at home with your bow and simple exercise equipment. Increase your bow poundage by as much as 25 lbs. in six weeks. \$19.95 + \$3.00 S & H. VISA/MC (915) 737-2343. Checks or MO to: Price Ebert, P.O. Box 1128, Dept. IA, Sweetwater, TX 79556-1128.

MEDICINE BOWS

STICKS AND STONES
FOR THE
PRIMITIVE ARCHER

BOW STAVES/BILLETS

OSAGE STAVES--\$55 TO \$100
OSAGE BILLETS--\$45 TO \$80
YEW STAVES--\$65--\$100
YEW BILLETS--\$55 TO \$80
VINE MAPLE STAVES--\$45
CASCARA STAVES--\$60
MULBERRY BILLETS--\$60

OBISDIAN

BULK--\$1.00/LB
(SHPG INCL)
SPALLS--\$5/DZ
(2"-4")
FLINT
CHERT

MEDICINE BOWS \$1-SASE FOR PRICE LIST
20309 132ND AV. E.
GRAHAM, WA 98338 (360) 893-3896 EVES.

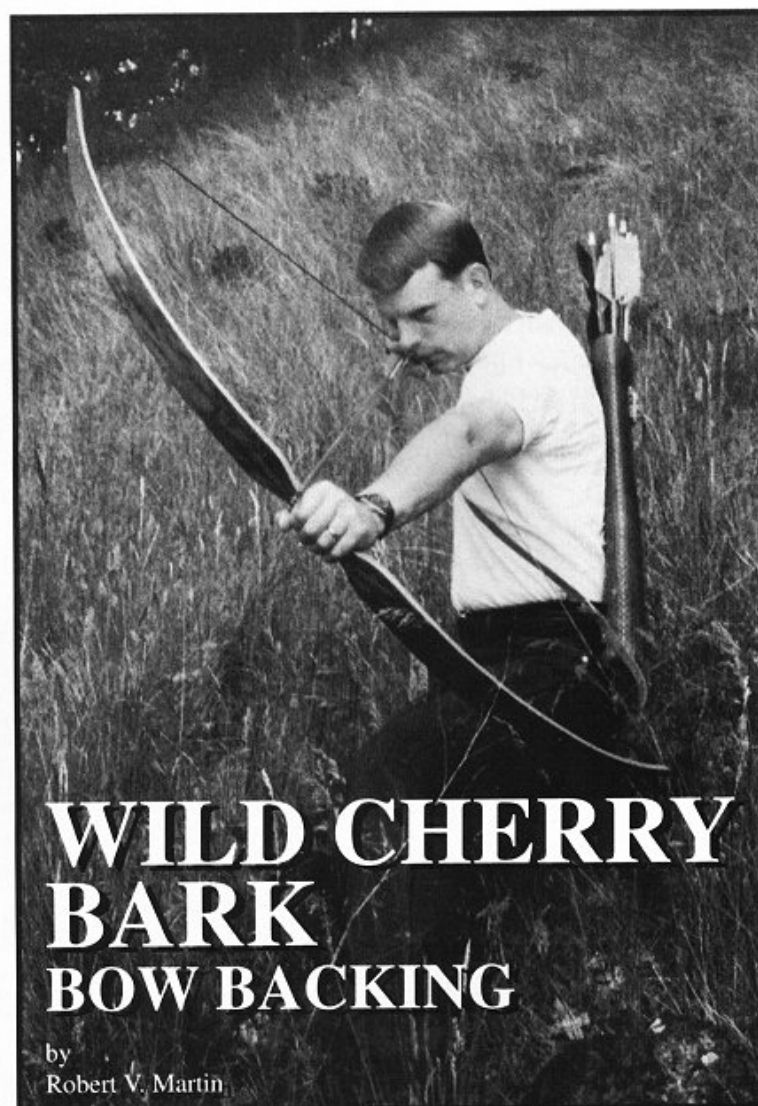
Several years ago I first observed a self bow backed with a wondrously beautiful and natural material that to my surprise was the bark of a wild cherry tree. I was very impressed with the looks of the finished and polished bark with its pattern of furrows running across the ruby-colored translucent surface. Knowing how tough cherry bark is and how it almost acts like a hose clamp in its ability to prevent wild cherry rounds from being split with a maul when cut for firewood, I was intrigued by its toughness as a possible bow backing. It is extremely strong in tensile strength for its weight. It would be interesting to measure its tensile strength compared to other natural backing materials. However, having plenty of current projects in various states of "incompletion" I filed this idea away in my mind under "Things I'd like to do someday."

Then one day recently it happened! While visiting my brother at his home in Oregon's Willamette Valley (the end of the Oregon Trail), I was walking through the woods on his property when I came across several large wild cherry trees which are common in this area. I immediately remembered my intended project and how beautiful that cherry-bark backing had looked. That's all it took for me to get right to work. In short order I collected enough bark to back several bows. It just so happened that I had recently completed a beautiful maple flat bow that was just begging to be adorned with cherry bark. The rich burgundy coloration of the bark would be the perfect natural covering for a hunting bow used at close range; much better than the light color of maple flashing about with this bow's 2 inch wide limbs. But before proceeding further in sharing this endeavor I will clarify a few points that you should be aware of.

The large wild cherry tree of the west, which I used for backing this bow, is correctly called Bitter Cherry (*prunus emarginate*). It varies greatly in size but under the rich moist conditions as found west of the Cascade Mountains of Oregon and Washington it may grow 40-50 feet tall and up to a foot in diameter. Its range is from British Columbia in the north, southward into southern California and from the shores of the Pacific coast inland throughout most of Oregon, Washington, and into northern Idaho and western Montana. It grows "shrub-like" in drier and higher elevation areas farther inland from the coast, resembling Choke-Cherry (*prunus virginiana*) which is also found throughout the same geographic area (and much farther east). The smaller "shrub-like" specimens of this specie would be very difficult to obtain suitable material from, as would Choke Cherry. The large specimens of the coniferous forests of the wet Cascade and Coastal Range mountains attain sufficient diameter to provide nice long strips of bark of sufficient length to use as bow backing material. And a beautiful material it is indeed, when polished to bring out its translucent ruby richness!

The wild cherry has an extremely tough bark, ask anyone who has split any of it for firewood. The wood will split under the blow of the maul but the pieces will usually refuse to separate without hacking on and splitting the bark. Often the round must be laid on its side and a blow given to the bark where the wood itself has split underneath, in order to free the split pieces. The cutting of the tenaciously-tough bark will then allow the round to fall in half. This alone should be recommendation enough for a backing material!

Cherry bark's toughness and strength is primarily in its lateral direction (circumference), as it grows on the tree. It



can easily be peeled off in this direction as its fibers seem to be all parallel and horizontal to the direction of the vertical growth of the trunk.

IT IS VERY IMPORTANT TO NOTE that only the extreme outer layer is useful for bow backing. The outer layer on the trees I used averages about 0.035" thick when dry. The removal of this very thin skin or "outer layer" should be done in such a manner so as not to disturb the inner or "main" layer of bark which is about 1/8th of an inch thick. Properly done, the removal leaves the cambium layer protected under the thick cortex of inner bark. If you wish to utilize cherry bark, be responsible and carefully remove only the thin outer layer so the tree will continue to survive. If the inner bark is removed around the circumference of the tree, the tree will die. The cambium layer which contains the vital lifeline of the tree, if cut completely around (girdled), cuts off the flow of vital nutrients from the roots and the tree has been "cut in half" as surely as if it had been bisected with a chainsaw. The cherry tree I used was recently knocked down by the wind on my brother's property. This made a great deal of bark easily available along its length. So much the better! Such "blow downs" should always be used in preference to a standing tree.

One has to choose a spot on the trunk carefully as the natural "splitting" of the bark and other natural irregularities (knots, etc.) will not peel cleanly nor produce quality bark.



Peeling the paper-thin outer bark from the tree.

The bark in its natural state looks gray and is covered by lichens and a grey-looking scale. These can be easily removed after the bark is dry by scraping lightly with the edge of a pocket knife. The beautiful translucent "ruby red" color of the outer layer will then be revealed. Cleaning up the bark should be done in phases: first, removing coarse material stuck to the surface after drying, and second, final clean up and polishing after being glued on the bow and allowed to cure.

Prior to being used as backing the bark must be dried. The bark must be laid out flat with a board on top of it to prevent it from curling up as it dries,

otherwise it will curl up like a scroll and dry that way. It will be as unworkable as a coil spring if allowed to dry without being pressed flat! Drying will take a few weeks in warm, dry conditions depending how thick your stack is and how warm and dry you keep it.

Wild cherry trees will not reach a large enough diameter to provide a single snip of bark long enough to completely back a bow without splicing. It will usually take at least three pieces or snips to completely cover the back. I covered the top and bottom limbs from the tip towards the handle first with my longest snips of bark. This left a midsection which I carefully measured to include overlap of at least an inch on each end. I then carefully shaved down the thickness of the bark in the overlap areas to eliminate the possibility of having a "bump" in the surface. After gluing, the splice will barely be noticeable. I glued the bark in place using Elmer's waterproof wood glue. I had carefully, cut the bark to the dimensions of the limbs and handle with scissors. After applying glue to the bow and inside surface of the cherry bark, I carefully wrapped the bow with strips of inner tube to supply the needed pressure and "clamping" necessary to provide proper

gluing. (Note: the bark must not protrude past the limb edges or it will buckle when wrapped).

After curing for two days in a warm, dry area (my living room), I carefully removed the inner tube snips and allowed the bow to cure in this state for a few more days. I then carefully scraped the remaining debris from the bark with a pocket knife and then using fine steel wool I polished the translucent ruby-colored bark to a smooth polish. The bark and bow were then sealed with several hand rubbed coats of Birchwood Casey's True oil wood finish and the results were beautiful.

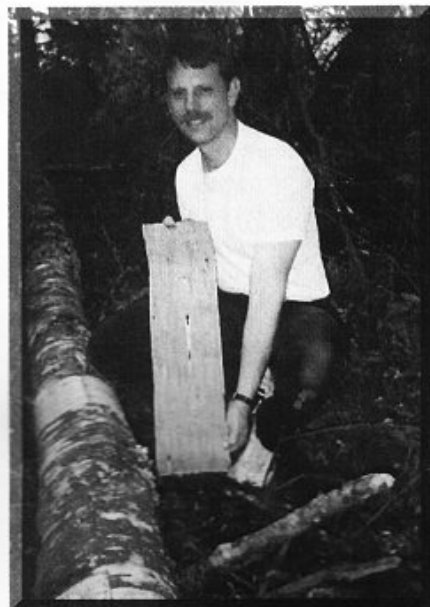
Bitter cherry bark provides a unique and attractive backing for a wooden bow and no doubt provides practical protection for the bow's back. People who see this bow always comment on the exotic looking backing with wonder and amazement:

"Now how did you do that, again?"

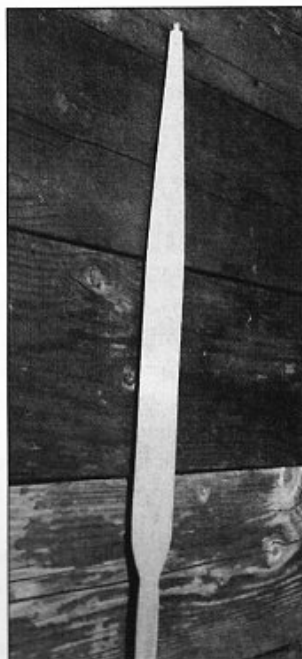
"Well, you go into the woods and you find a cherry tree. . ."



References: *Forest Trees of the Pacific Coast*, by George B. Sudworth
Master Tree Finder, by May Theilgaard Watts



A fresh strip of "outer bark" peeled from a bitter cherry bow down. A bow stave was also cut from this section of this tree.



Maple flat bow prior to backing with cherry bark. Too bright for a hunting bow!



Close-up photo of the maple flat bow with its new bitter cherry bark backing.

Ten Days in May

by the
IA Staff

Following the helium balloon across the sky!

Spring is a magical time in the Rocky Mountains. High-country snow storms slowly trade places with the ever-warmer spring rains; flowers and grasses burst forth in a proliferation of sights and smells. It's the season when cow elk and moose begin looking for grassy meadows to calve, and the season when traditional archers begin stalking mountain slopes and valleys in search of adventure, challenge, and camaraderie. So it was in the middle of May, as bowmen from all over the West converged on two of the spring's premier traditional archery events: the **Quad-State Traditional Rendezvous at Cedar Creek** (near Blackfoot, Idaho) and the **Western States' Traditional Rendezvous** (held this year near Tigh Valley, Oregon).

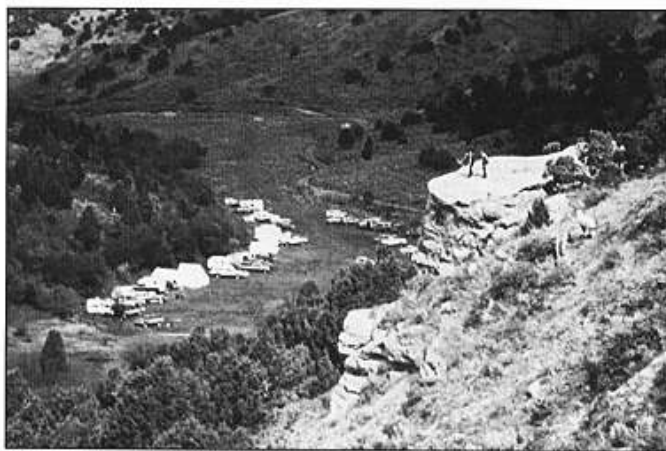
The Quad State Rendezvous is an annual event held in south-east Idaho drawing traditional archers from all corners of Idaho, Montana, Utah, and Wyoming. The two 28-target ranges meander through prime big game habitat, and are arguably the finest ranges in the U.S. The first range began with a steep climb through heavy brush leading to a black bear standing in front of a broken snag. Then it climbed even higher past several targets to a lone coyote on the crest of a ridge. The coyote was a tough, uphill shot, and those who aimed a bit high were in for a long hike to retrieve their arrows from the other side of a mountain swale. Those who aimed low were usually left with kindling amongst the rocks.

The course continued up even higher, to the crest of a large rocky cliff, which just happened to have a record-class

mountain goat standing at its base. The shot was almost steep enough to simply drop the arrow thirty yards down to the goat, and it felt as though we were on a real goat hunt. The shot was a tough one, but so is goat hunting. I don't think we would have it any other way. For many of us, challenge is at the heart of our love for traditional archery.

Several targets later, we found ourselves in the damp shade of a thickly-grown aspen thicket shooting at full-size McKenzie elk and mule deer. This was ideal hunting country, indeed—Idaho's number three Pope and Young Shiras Moose had been taken just a short hike from here in 1995 (moose sign was scattered all over the hillside). Around another draw the terrain changed again to open sage country, with antelope targets placed just far enough away to demand total concentration with each shot.

Slipping through the trees and brush on the steep slopes made many feel as though they were experiencing a fine fall hunt, at least until the sound of the steel target echoed through the trees. And what a steel target it was. The boys from Eastern Idaho had just a wee-bit of fun making this one, and had created a rather unique (and slightly lewd) hanging monkey with an attitude (judging from the very unfriendly hand gesture he offered to all who passed). It was a challenge few could pass up, and the satisfaction of nailing the little monkey caused more than a few shouts of triumph, and ended in more than a few shattered arrows and loud laughter when arrows missed their mark.



Some played it safe, others hung their toes just over the edge as they tried to hit the mountain goat at the base of the cliff.

On the other side of the mountain, the course began its descent down toward camp, through shady aspen thickets, and past the running deer target (who could resist a few extra shots at this one?). But the highlight of the first range was the impromptu shooting from the top of a ridge down to the banks of a small pond over 100 yards below. Pick a small bush, draw back, raise the bow, raise it some more, just a little more, then loose the string and watch the arrow slowly arc all the way down to the edge of the pond. Our quivers were emptied in the span of a few minutes as we laughed at and teased each other for missing such an easy mark at over 100 yards!

At the end of the first range stood a huge bull elk made of canvas and foam. The rack on his head would make even the most battle-hardened elk hunter drool with envy. As I heard the story told, Dave Bidwell had traded a sheepherder two cases of beer for the awesome rack, and now there it stood on a bull 70 yards away, just begging us to try our skill. What a great target, and a fantastic way to end the first range.

Back in camp, hunting tales filled the air, arrows filled the practice butts, and vendors displayed everything from custom "gotta-have-it" bows to goat panniers. With only 12 weeks until the opening day of antelope season, it was time for many to provision for the fall hunts. Broadheads, shafts, fletching in many hues, and all manner of accessories were displayed for all to see and purchase. It was the ultimate bowhunters' shopping mall!

After a quick lunch and a bit of shopping, we headed back up to check out the other range, which meandered back and forth over a rain-swollen creek, then climbed high into the timber. We tested our skill on turkey, coyote, elk, deer, and bear targets. We shot around the brush, under the brush,

and through the brush; up aspen-thicketed hillsides, and down bitterbrush covered slopes. It was as close as a person can get to actual hunting conditions, and we were enjoying ourselves immensely.

After a night of typically unsettled Idaho spring weather, Sunday morning began under cloudy but dry skies with a blanket shoot, where each participating archer put an item on the blanket (actually a table top). Anything could be put on the "blanket" from a custom bow, to an arm guard, or a six-pack of pop. If you are unfamiliar with blanket shoots, they work as follows: (1) everyone who wants to participate places an item on the blanket; (2) everyone goes shooting and records their scores; and (3) the shooters return, and are allowed to take an item from the blanket. The first place shooter in the men's division gets first choice from the men's blanket, the first place woman gets first choice from the women's blanket, and the first place youth gets first choice from the youth blanket, etc. Then the second place finishers make their choices, all the way down to the people who shoot the lowest scores. In a blanket shoot, everyone wins

something. (The most difficult part of a blanket shoot is choosing between that matched set of custom arrows or the deluxe backquiver.)

Later that afternoon, three progressive steel target eliminations drew almost the entire camp as either spectators or participants. This year's target was a coal-black steel bear with ethafoam lungs and a hatred for poorly-placed arrows. Almost everyone put their arrows into the foam at the first shooting line (approximately five yards). However, the crowd of shooters began to thin at the ten yard mark, and by the time they were thirty yards from the bear, the competitors had been whittled down to two or three of the best (or luckiest) archers in the group.

Many of you may be surprised at the amount of strategy that goes into a steel target elimination. Dedicated steel target enthusiasts craft special arrows just for an event such as this. For example, Kelly Peterson, of Arrows by Kelly, competed with a laminated maple shaft that was as tough as nails. Unfortunately, on about his fourth shot he hit steel. The wooden shaft came through the trauma unscathed, but both the steel point and plastic nock were history. The rule is that an archer can continue in the competition for as long as his or her arrow is still shootable. Kelly's arrow had no nock and no point, but with the aid of a quickly gathered volunteer pit crew and a Leatherman tool, Kelly and his pit crew quickly filed a self-nock into the laminated maple shaft, and by the time it was Kelly's turn to shoot again, the arrow was ready to fly.

That self-nocked, pointless, laminated maple shaft made it all the way to the semi-finals before it was finally too short to hit the mark, amid



The steel bear was easy at this distance. But at 35-yards he ravenously devoured even the most exquisitely-crafted arrows.

much amusement from the vocal spectators, who seemed to get as much enjoyment from seeing arrows break into flying shrapnel as from watching them sink into the soft foam.

Despite threatening weather which kept the turnout lower than expected, the Quad State Rendezvous turned out to be another sweet success. With courses set in prime hunting country, it's no wonder archers are willing to travel far to attend this growing event.

1996 Western States' Traditional Rendezvous

Five days later, we turned south from the freeway paralleling the broad expanse of the Columbia River and followed a two-lane highway through green rolling hills and oak trees to Tigh Valley, and the site of the 1996 Western States' Traditional Rendezvous. A different western state hosts the Rendezvous each year, this year's hosts were the members of the Traditional Archers of Oregon (TAO). Set in prime deer and turkey habitat, the ranges wandered through mixed oak and pine trees (with a few strategically placed rocks). The weather couldn't have been any nicer. Beautiful blue skies graced the traditional archers from all over the west who

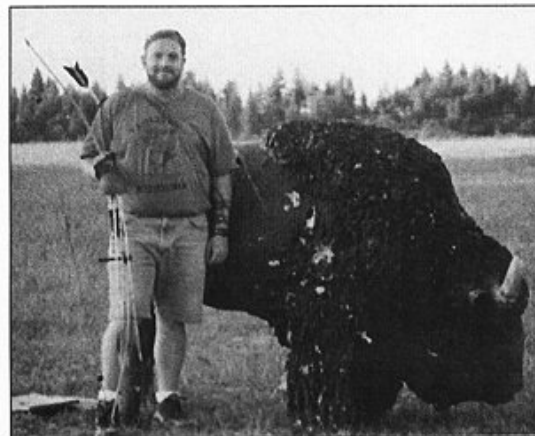
had come to have fun and share a three-day weekend with old friends and to make new acquaintances.

Vendors' Row was an archer's dream; custom bows by many of the country's top bowyers, high-quality wooden shafts by the thousands, and archery goodies galore. But, as always, the best part about the Rendezvous was sharing the open ranges and evening campfires with old friends. Shortly after dark each night, someone would travel from group to group gathering archers for an impromptu flashlight shoot. Then, a few short hours later, as soon as the morning sun peeked over the mountain to the east, archers began hiking through the trees in search of foam targets and well-placed shots. While the ranges did not count for score on Saturday, there was plenty of friendly competition going on, and judging from the smiles of the shooters, everyone was having a grand time.

As the temperature slowly began cooling on Saturday evening, the long-distance antelope and buffalo contest began. When the shooting was over, one archer, Mark Wolfgang of Nampa, Idaho, took top honors with a fantastic 100+ yard shot. Congratulations Mark!

As fun as the long-distance shooting was, the helium shoot took top billing as the fun event of the weekend. With a gentle breeze slowly guiding the colorful balloons on a slow but erratic upward arc past the long row of eager archers, the sky was soon filled with whistling arrows, and the occasional "POP!" signifying a perfect shot. However, most of the noise coming from the shooting line sounded more like "AARGH!!!" or "OH MANNNNNN, I ALMOST HAD IT!"

Amid the moans and groans of near misses, the popping sound of a bursting balloon was always followed by an enthusiastic cheer from the growing crowd of shooters and spectators. After



Mark Wolfgang handily won the long-buffalo shoot with a high-arching, beautifully-placed arrow.

the first few volleys of flu-flus, people began shooting even their regularly-fletched arrows at the balloons until their quivers were totally empty. Never mind that they flew nearly to the next county, this was just too much fun to pass up!



Jim Dinelli made it look easy at the 100-yard antelope.

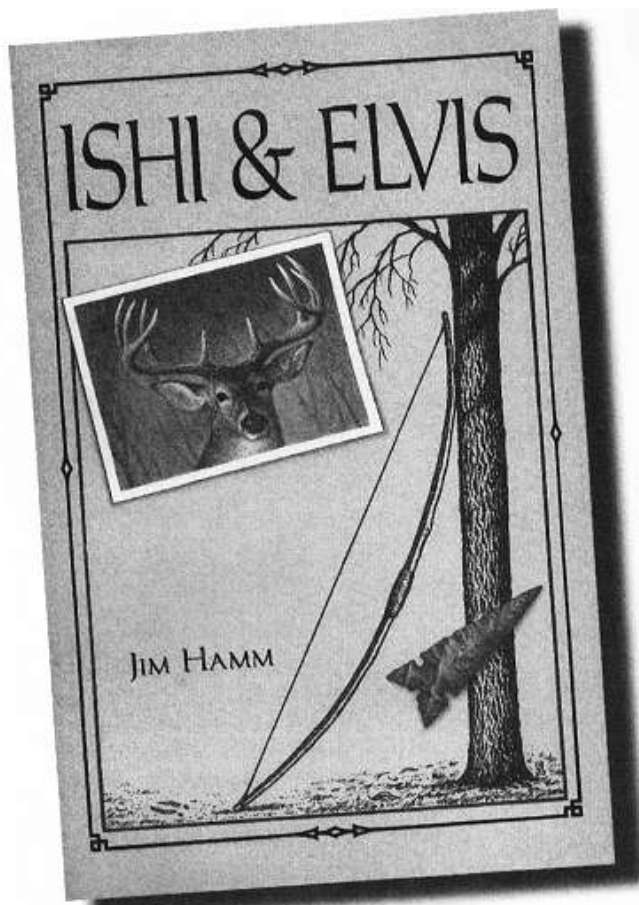
Even the youngsters were enjoying the event, as they had several bobbing balloons tied to long strings to shoot at. The excitement showing on the youngsters faces when one of them would hit a balloon was fun to see, and it serves to remind us all of why we shoot the bow in the first place. In the end, for many of us, it all comes down to fun.



Even the dogs loved it!



Judie Heath bringing in a nice load of firewood for the evening campfire.



ISHI AND ELVIS - A Review

by Paul King

I don't read books twice, at least not as a general rule. I read *Sometimes a Sudden Notion* by Ken Kesey twice and Larry McMurtry's *Lonesome Dove* twice, but those two jewels had been it, until last week. There is an excellent chance that I will eventually read *Ishi and Elvis* a third or even a fourth time. Remarkably, this little book reads not unlike great poetry or drama, revealing layer upon layer of meaning as you experience it over and over again.

The title of the book comes to us, obviously, in code. The average person, encountering the title, may respond (quite naturally), "What the hell does that mean?" On the surface, what it means, what the book is about, is *Ishi*, the last "untamed savage," who came down from the foothills of Mt. Lassen in the first part of this century; and *Elvis*, a great whitetail buck, so seldom seen, like his Preslian counterpart, that his very existence is in doubt. On the surface, this explanation of the title seems serviceable enough. But, as in all well-coded messages, the title, *Ishi and Elvis* has deeper meaning, representing far more than just a lonely Indian and an oversized and elusive whitetail deer.

Now I don't pretend to lay claim on the "true" meaning of this or any other hunk of literature as poetic and profound as this one happens to be, but I would like to make a stab at it. I can only pray that Mr. Hamm will forgive me if I happen to be wrong. The larger meaning of this book, and its importance to the reader, has to do with mankind's inexorable

connectedness to the land. This undeniable relationship exists on two levels, the book tells us, the practical, food to mouth and air to lung relationship of humanity to the earth we inhabit (*Ishi*) and, less obviously but equally important, the spiritual, even magical relationship between mankind and the entire universe that surrounds us (*Elvis*).

Reading the book, we are allowed to share in Jim Hamm's gentle and reasonable view of how things came to be in his part of the world and where they are going, of how a man can affect what is going to happen and how he can't, and, most importantly, how facing the struggle with grace and dignity makes the whole thing worthwhile. Hamm covers the vast panorama of Texas history with the kind of clarity and insight that makes the past seem as alive and real as yesterday or tomorrow. At times, he speaks so eloquently about family, about husbands and wives, and fathers and sons that he'll make you want to cry.

The story of the author's determined efforts to provide responsible husbandry for the small corner of this earth over which he has some control, the restoration of a "goated" Texas ranch, provides a launching point and point of focus for consideration of mankind's management of the far larger arena of the earth as a whole. The story of *Ishi*, primitive archery, bowmaking, hunting, and warfare serve as a through-line for the examination and consideration of the path of human anthropology and history. Even more importantly, archery and hunting serve as a direct link between present and past, and as Hamm puts it, reason for direct "participation in the dance of life." We are left with a penetrating vision of our responsibility for what is and what will come to be.

As I said before, this book isn't only about the body of man, it is also about his soul. My favorite thing about *Ishi and Elvis* is the affirmation of a long-held personal conviction that there is room for, even a beautiful necessity for "magical" thinking as we wind our way through this maze of unanswered questions that we call life. The book speaks of "the lifeblood of the heartbeat out beyond the circle of lights," a presence of spirit that I believe every sportsman has sensed at one time or another. This "heartbeat" is referred to again and again in one way or another, but my favorite reference, perhaps my favorite paragraph in *Ishi and Elvis*, will serve as a fitting conclusion to my humble attempt at analysis of this wonderful book:

"The bugle-clear trilling of passing sandhill cranes drew my attention from Elvis' hillside. I finally located them with the binoculars, very high and far off near the horizon, their long V pointing the way for the colder season to follow. The crane's migration made autumn official, not by the calendar but by the feel, a much more proper way to determine such things. In fact, if the cranes and geese ever become so weak as a species that they fail to make their treks, spring and fall might cease to exist, indeed, the earth might well stop spinning on its axis."

Whether viewed with an analytical eye or not, this is a great read. We can only hope that Mr. Hamm will soon grace us with more of the same.



ISHI AND ELVIS is available from:

Bois d'Arc Press
P.O. Box 233
Azle, TX 76098
(817) 237-0829

READERS' SPOTLIGHT

In the premier issue we asked our readers for photos of their home-made back quivers.

For our next issue, we would like to see your favorite "BUDDY PHOTOS." If you have a great archery-related photo of one or more of your "buddies," whether it is in hunting camp, at an archery shoot, or just in the back yard shooting targets, whether it is a serious photo or a humorous one, please send it to us for inclusion in our next READERS' SPOTLIGHT, and make your buddies famous!

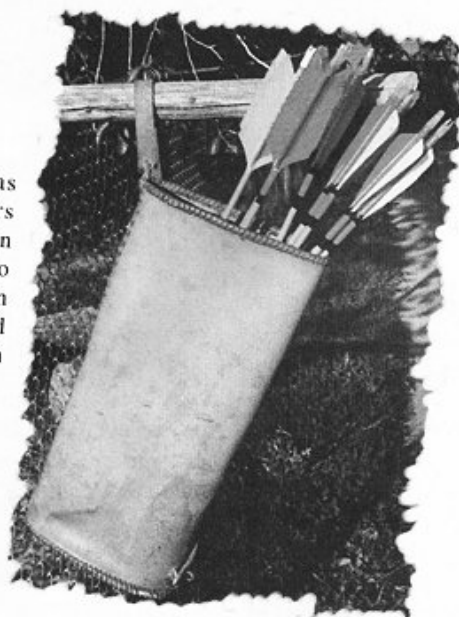


Dennis Ambriz with traditional Sioux quiver/bow case and a far-off look in his eyes.



Ken Bilstein of Mendocino County, California with large Deer Skin quiver.

This quiver was made many years ago by Bob German of Blackfoot, Idaho to carry arrows in transit. It will hold three-dozen with ease.



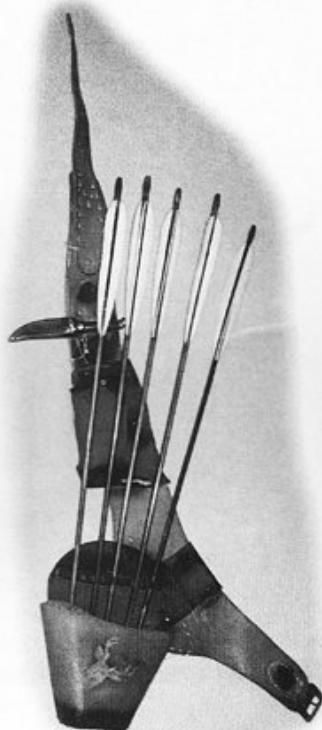
R. C. from Smith River, California with



Dr. Michael Cummings of Kennewick, Washington. The bear and hound scene on the quiver is inked in, but as yet unpainted.



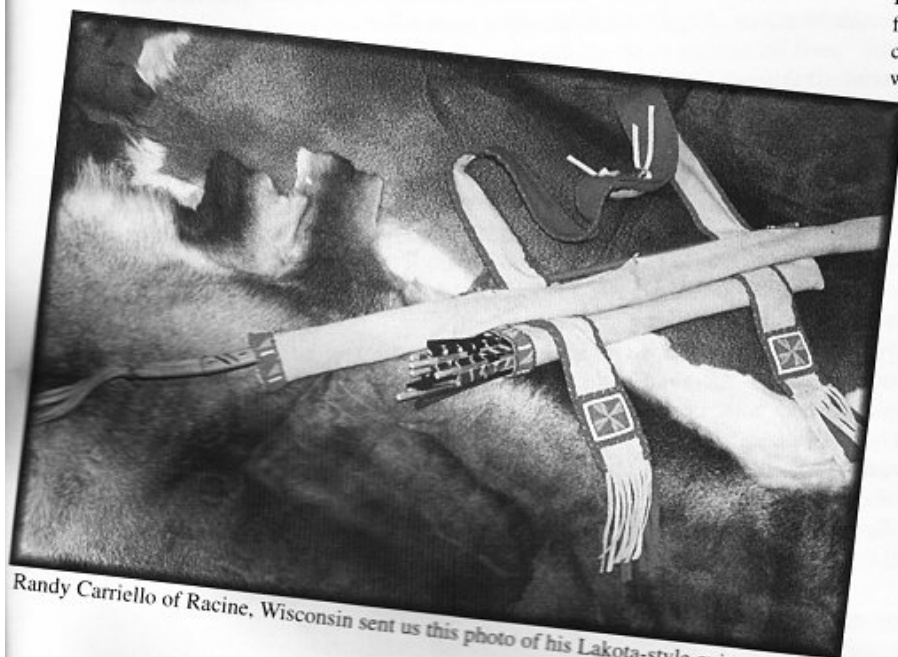
Jerry Stout of Vale Oregon made this quiver from the hide of a white tail. The rack is from his 1995 Oregon mule deer.



Persian horse-archer hip quiver by Thomas H. Shorey of Mill Creek, Washington.



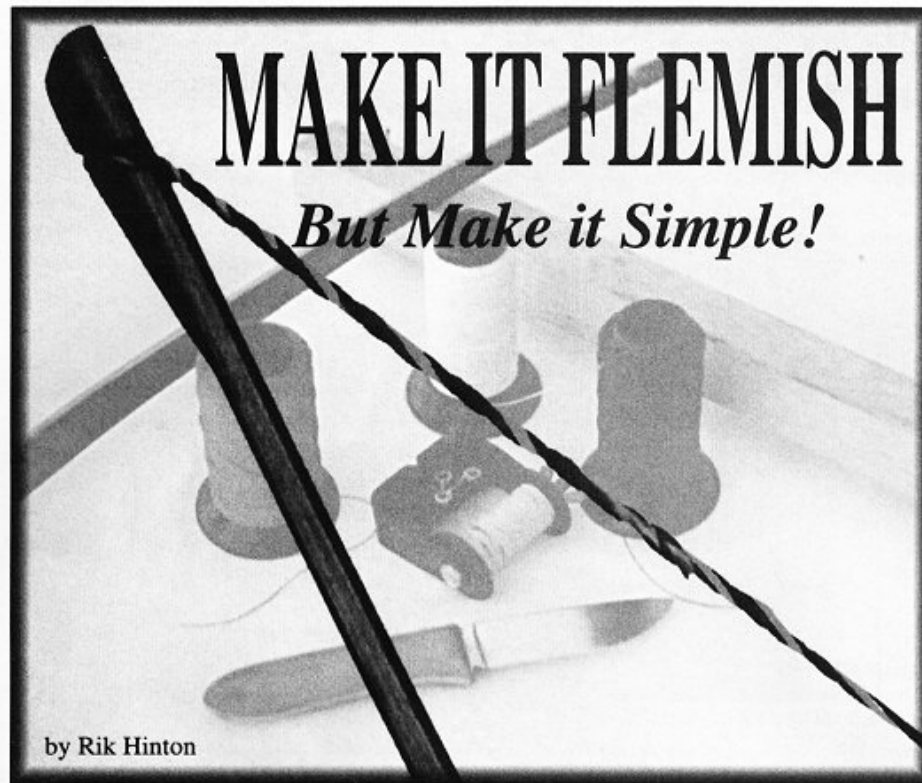
You should see this one in color! Ben Carey of Kent, Washington, made this outstanding quiver from deer rawhide, engraved and painted it, coated it with spar varnish, and lined the inside with tanned elkhide.



Randy Carriello of Racine, Wisconsin sent us this photo of his Lakota-style quiver.



Dale Morgan of Cottonwood, California with a beautifully-beaded bearskin quiver.



I was taught to build flemish bowstrings over a decade ago by the same man who first put a *custom* recurve in my hand, Jeff Graham. Jeff was a bowyer, but first and foremost, he was a bowhunter who loved to make his own equipment. I met him on a warm afternoon as I was riding my mountain bike through town. I banked sharply around a corner and looked up to see a truck pulling a large moving trailer with Montana plates and several huge elk racks tied to the top.

Being an Idahoan and therefore a lover of all things elk-related, I naturally followed the truck for a couple of blocks, and when it pulled to a stop in front of a vacant house, I coasted up beside the driver's door and uttered the same words we all do in situations like this: "Nice racks!" After a few minutes of conversation, we realized that we were both bowhunters, and even worse, both die-hard elk hunters. Jeff and I made fast friends that afternoon as I welcomed him and his family to Idaho and helped them unload their possessions and move into their new house.

I consider that afternoon well-spent, because in addition to becoming a good friend, Jeff later taught me how to make a flemish bowstring. In less than an hour he showed me what is to this day, the simplest way I have seen to make a flemish string. He didn't use a fancy jig, he didn't use any fancy tools, and I didn't need a user manual to figure out how it was done. The key to the whole process, and the beauty of it, is its simplicity.

With the proper instruction and nothing more than a sharp-edged knife, some dacron or linen thread, and two nails you too can make your first flemish string in less than an hour. After you have made three or four strings, you will be able to do it in under 30 minutes. The only trick to making a

flemish string is being shown how to do it. You can either learn how to do it the complex way, or the simple way. As with all things in archery, I prefer the simple way.

This article will walk you through the process of making a sixteen-strand, three-ply flemish string just as I learned it from Jeff, one step at a time. The first step is to gather the following materials:

1. Linen or dacron thread in either one, two, or three colors (depending on how fancy you want the string to look),
2. Serving material (I used 38# braided fly-line backing),
3. String wax,
2. One two-by-four or a long straight stick, and
3. Two small nails.

MAKING THE WORLD'S SIMPLEST STRING BOARD:

Step One:

Pound nail #1 into the board a few inches from the end (see figure 1).

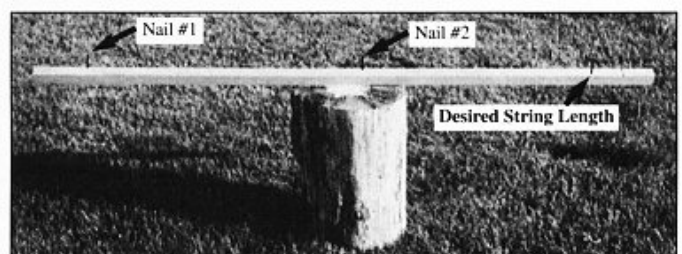


Figure 1. Completed string board.

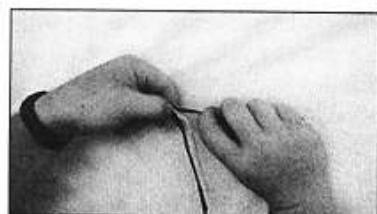


Figure 2.

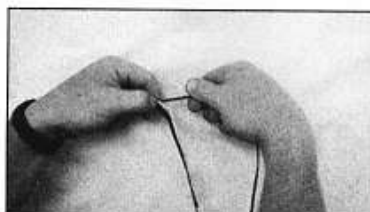


Figure 3.

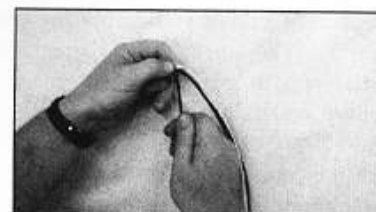


Figure 4.

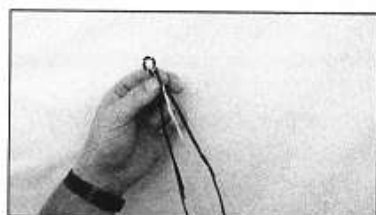


Figure 5.

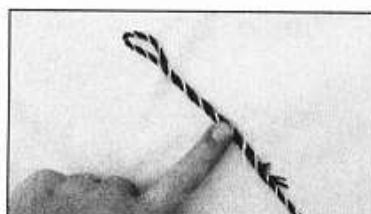


Figure 6.



Figure 7.

Step 2:

Remove the string from your favorite bow, place one loop over nail #1 and pull the string taught toward the other end of the board. Draw a line on the board where the string ends. This will be the mark used to determine the final length of the new strings you make for this bow.

Step 3.

Hook the second loop of your bowstring over nail #1 (both loops are now over nail #1 and the string is folded in half). With the string folded in half, pull it taught along the board and place your finger where it ends. Add one hand-span (approximately 9 to 10 inches) to this length, mark the spot with a pen, and hammer in the second nail on the mark you just made. Your string board is now finished.

MAKING THE STRING:

Now that the hard part (making the string board) is over, its time to make a string. These instructions are written for right handed people, but can be easily reversed for those of you who are left-handed.

Step 1.

Tie one end of your thread to nail #1 (see figure 1). Then wrap it around nail #2 in a clockwise motion and bring the thread back to nail #1. Do this five

times, then cut the strands in half at nail #1 and place them aside. These five strands of thread will comprise one of the three larger strands of your flemish string.

Step 2.

Repeat step 1 above using the thread color of choice.

Step 3.

Repeat Step 1 again with the thread color of your choice, but make six revolutions around the nails instead of five. When you have completed this step, you will have three groups of string: two groups of five strands each, and one group of six strands, which totals 16 strands.

Step 4.

Grasp the group of thread made in step 1 near the middle and rub string wax on it until the entire string is coated with wax. Then quickly rub the string between your thumb and forefinger several times to heat the wax and work it into the entire length of the thread. This will turn the five or six strands of thread into one larger, cohesive strand. Repeat this step with each of the other two strands from steps two and three above.

Step 5.

Pick up all three waxed strands in your left hand approximately 10 inches (one hand span) from the end, with the short ends facing to the right (see figure 2).

Grasp the strand farthest away from you between your right thumb and forefinger, and twist the strand in a clockwise motion away from you (see figure 3). Now pull it toward you over the top of the other two strands and grip it tightly with your left thumb along with the other two strands (figure 4).

Step 6.

Repeat step 5 by grasping the strand that is now farthest away from you between your right thumb and forefinger, and twisting the strand away from you (clockwise). Now pull it toward you over the top of the other two strands and grip it tightly with your left hand along with the other two strands.

Step 7.

Again, grasp the strand farthest away from you between your right thumb and forefinger, and twist the strand away from you (clockwise). Now pull it toward you over the top of the other two strands and grip it tightly with your left hand along with the other two strands.

Are you beginning to see a pattern here? **The twisting motion you have just learned is the secret to the flemish string.** "Twist away, pull over the top. Twist away, pull over the top." It's as simple as that!

Step 8.

Repeat the twisting process until you have a twisted section long enough to

form the top loop of your bowstring (see figure 5). The length differs depending on the width of your bow limbs. Recurve and flatbow loops are larger, longbow loops are smaller. (Be sure to make the loop large enough to fit over your top limb.)

Step 9.

Grasp the strands together to form a loop as shown in figure 5. With your right hand, group all strands of the white thread together, then do the same for each of the other two colors.

Step 10.

Now that the groups of thread are bundled into three groups, continue the twisting process (twist away, pull over the top). Continue twisting until the short ends of the string fade out, and then twist for another 1/2 to 3/4 of an inch. Your first loop is now complete, and should resemble the loop in figure 6.

Step 11.

Place the newly-formed loop over nail #1 on the string board and pull the string taught toward the other end of the string board. Twist the entire string counter-clockwise 12 to 15 times. Maintaining tension on the string, grasp it with your left hand 3/4 of an inch below the full-length string mark (see figure 7). This will be the beginning of your second loop.

Step 12.

With the string grasped in your left hand, begin the twisting process again. Continue the twisting motion until you have a twisted section long enough to form the bottom loop of your bowstring.

Step 13.

Repeat the loop-making procedure explained in steps 9 and 10. Your second loop should now be complete, resembling the loop in figure 7.

Step 14.

Place one loop over nail #1 and pull the string taught toward the other end of the string board. The string should now be slightly longer than the mark you made on the string board to indicate the final length of your string. Twist the string counter clockwise to shorten the string until it matches up with the mark.

Step 15.

String your bow using the new string. When the bow is strung, check your brace height and adjust it if necessary by either twisting or untwisting the string. When the brace height is correct, rub string wax into the full length of the string, and then rub the string rapidly between your fingers to heat the wax and melt it into the string.

Step 16 (optional).

Depending on how you like your strings to look, you may or may not want to trim the short ends poking out of the string. I like to leave these short ends poking out

to add that "wild look," but if you like the clean-cut look, simply trim them carefully with a sharp pair of scissors (be careful not to cut your new string).

SERVING YOUR NEW STRING

Step 1.

Serving the string is a very simple procedure, but is difficult to explain on paper. The following steps can be completed with or without a string-serving tool.

First, determine where the upper end of the serving will be (generally two to four inches above your bow's arrow shelf). Now, wrap the end of the serving thread loosely around the string two or three times to the left "toward the arrow shelf" (see figure 8). You should have approximately 1/4" between wraps.

Step 2.

Begin tightly wrapping the serving thread counter clockwise toward the bow shelf, over the three wraps you just made. This will lock the serving in place at the upper end (see figure 9.).

Continue wrapping the serving thread tightly around the string until the serving covers approximately eight inches of the string.

Step 3.

Look closely at figure 10. With approximately 15 inches of serving thread, make a large half-loop (A) about 3/4" from where the wrapped serving ends

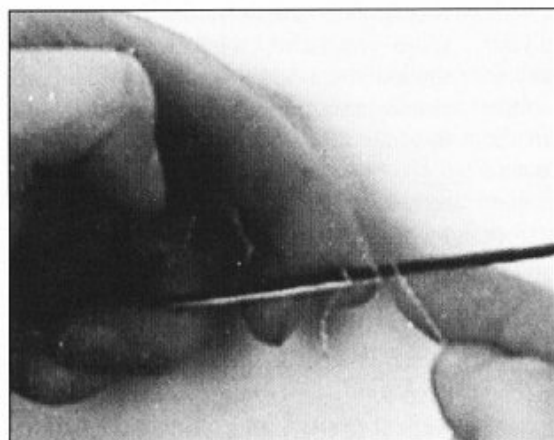


Figure 8.

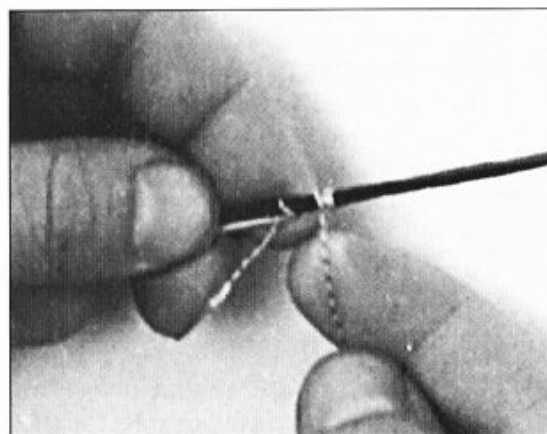


Figure 9.

(B). Then, with your left hand, wrap the serving thread clockwise approximately ten times back toward B. Now take the serving thread at point C and continue wrapping it in a counter clockwise motion over the top of the other serving, which will unwind the string from point A until all 10 wraps are used up.

Step 4.

Pull the remaining thread tightly (see figure 11)until the loop disappears. Then trim the excess thread with a knife.

CONGRATULATIONS! You have just completed your first flemish string!

Once you have mastered this most basic of all the archer's crafts, you will never again be without a custom flemish string for long. Nor will you be without friends and relatives who will ask you to teach them the "secret of the flemish string." Teach them well, and remember, keep it flemish, but keep it simple.

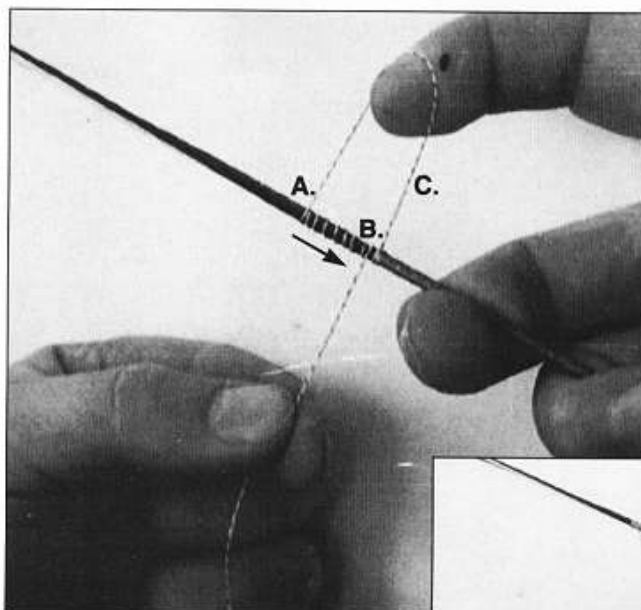


Figure 10.

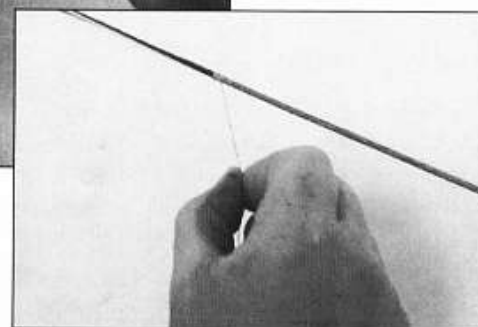


Figure 11.



	<p>E.T. WILLIAMS TRADITIONAL ARCHERY, INC. P.O. BOX 16814 West Palm Beach, FL 33416 (407) 967-2747</p> <p>OUR BOWS DO IT BETTER! AND AFTER ALL, THAT'S WHAT YOU BUY A BOW FOR.</p> <p>NO, IT'S NOT BECAUSE OF OUR ARROW SPEED, OUR FAMOUS MASS-FORWARD RISERS, OUR EXPANDING-VIEW SIGHT WINDOWS, OUR USE OF EXOTIC MATERIALS, OUR METICULOUS ATTENTION TO DETAILS, OUR REFRESHINGLY INNOVATIVE DESIGNS, OR OUR SMOOTHNESS AND STABILITY.</p> <p>YOU SIMPLY BUY A BOW TO SHOOT, & THAT'S WHAT OUR BOWS DO BEST!</p>
--	--

As it has always been. . .

*From the beginning of time,
we have named the bows we carry into the field.
The name comes from somewhere deep in the archer's soul,
and is as necessary as the string or the arrow.
So it shall always be. . .*

Rik Hinton

The following is a list of special names that customers have requested to be written on their bows. This list was provided by Dan Berry Archery, 6511 S Plymouth Rd, Spokane WA 99204 (509)838-8122

"95"
25th. Anniversary Bow
Achille
Akita Mani Yo
Amazing Grace
Ape Palm
Arrowtrue
Banjo
Big Bull
Big Mac
Black Forest Traditional
Blackfoot
Bobbie Lee
Boe
Bonz-Dedicated to my Father
Boogidy
Boss
Bruno
CAN-DI-SU-TU
Carol Mae
Chicken Bone
Cowboy
Cristina
Deac
Death Wind
Deer Slayer
Dinner Bucket

Dragon Slayer
Dream Catcher
EDNUK
Eightball
El Lobo
Elvira
Enrico
Festus
Fillippo
Flexible Flyer
Forever Eva
From Terri, 10TH. Anniversary
GLORY - 95"
Giovanni
Griz
Happy Birthday from Carla
Hoss
IKIGNI-IYOTANYAPI-AHOKIPA-
OSANKAYAKEL
In Memory of Colin Maclare
In memory of Alvin Martin
Instinctive Archer
It's Yew
Ivano
JOB 29:20
Keiva
Koonepeam Nompukheik
Limd
Little Bear #3
Little Ben
Little Bow Joe
Made in USA
Maggie
Mario

Mars?
Massimo
May the good Lord be
my outfitter and guide
Mint
Miscauna Creek
Montana
Mountain Man
Mrs Boogidy
Nando
Old Faithful
Old Gray Wolf
One-Life
Pauline
Paw-Paw
PBS
Pic
Pick a spot
Predator
Quiet Man
Red Hawk
Redzone
Rembrant
Retsu
Riccardo
Rosebud
Sacha
Sees Far
Siempre Recto
Skinner
Sneaky Snake
Soul Hunter
Spirit Hunter
Susie
Sweeney
Tas Kan's Kan
The Alamo
THE JUDGE
There can be only one!
Tucannon
Turkey Hunter
Vic
Vincit Qui Se Vincit
Vixen
Voodoo Child
Voodoo Stick
WALKARA
White Tail
Wild Bill
Wolf

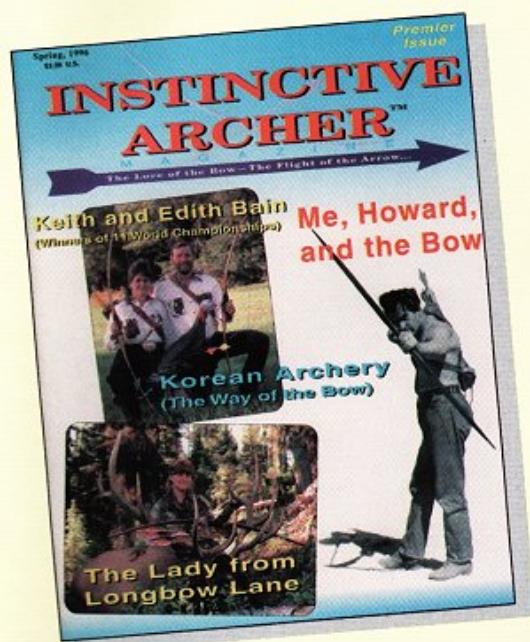
INSTINCTIVE ARCHER™

M A G A Z I N E

The Lore of the Bow—The Flight of the Arrow...

IF YOU...

- See beauty in the flight of a perfect arrow.
- Want instructive articles written by champion archers from around the world.
- Love the history and romance of archery almost as much as the sport itself.
- Enjoy the thrill of the hunt **AND** the challenge/camaraderie of tournament archery.
- Want to become a better archer.



Then subscribe to an
exciting new magazine
with a refreshingly
different perspective.

SUBSCRIPTION INFORMATION

U.S. SUBSCRIPTIONS:

One Year: \$12.00

Two Year: \$23.00

CANADA SUBSCRIPTIONS:

One year: \$22.00 U.S.

FOREIGN SUBSCRIPTIONS:

One year: \$30.00 U.S.

Please send a check or money order to:

INSTINCTIVE ARCHER™ Magazine

P.O. Box 45299, Boise, ID 83711-5299

Allow 6 to 8 Weeks for Delivery

We also accept VISA and Mastercard™ (Phone: 208 465-9893)

Begin your collection today!

Order the **PREMIER ISSUE** of
Instinctive Archer™ Magazine.

Premier Issue:\$4.50

Shipping and Handling:

U.S. Orders Add:\$2.00

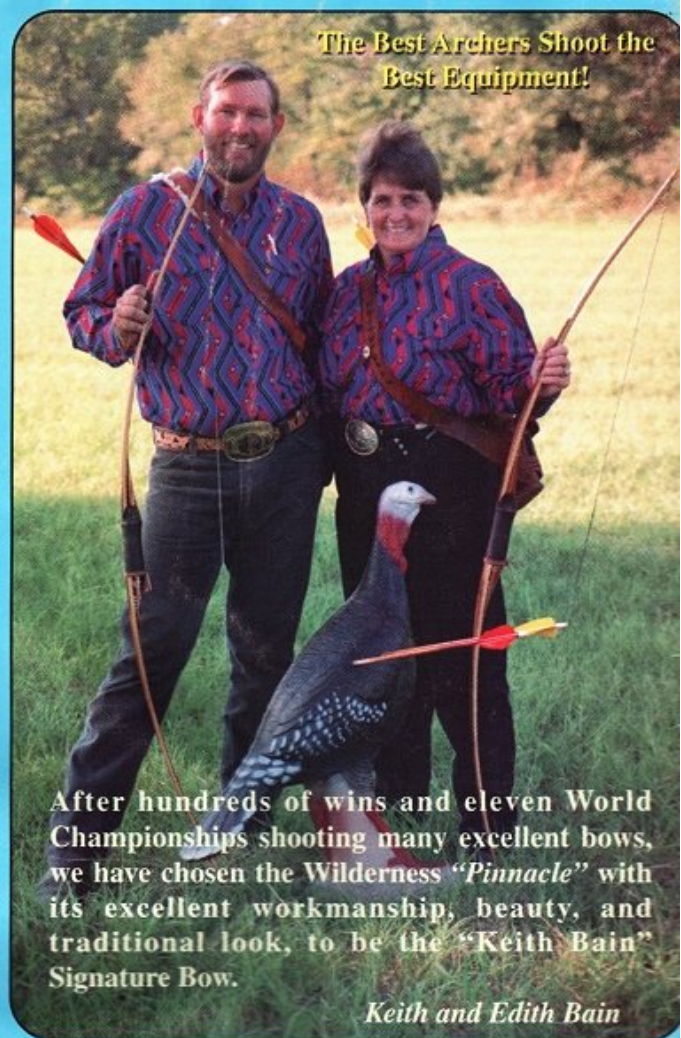
Canadian orders add:\$3.00

Foreign orders add:\$4.50

LORE: A body of wisdom or knowledge . . . especially when it is of a traditional nature.



The Best Archers Shoot the Best Equipment!



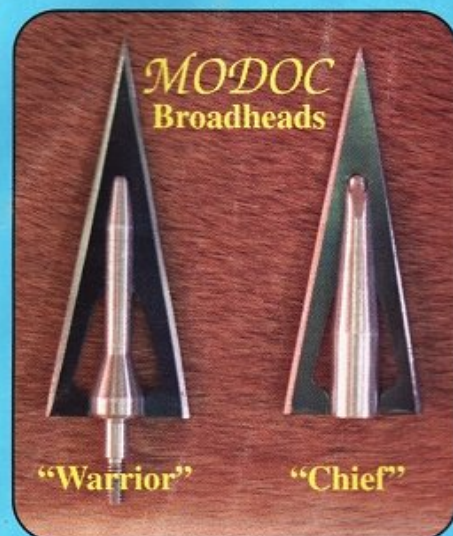
After hundreds of wins and eleven World Championships shooting many excellent bows, we have chosen the Wilderness "Pinnacle" with its excellent workmanship, beauty, and traditional look, to be the "Keith Bain" Signature Bow.

Keith and Edith Bain



Wilderness Bows **MODOC Broadheads**

1015 Central Pit Lane
Nampa, ID 83687
(208) 466-1827



- Blue Clock Spring Steel (Rockwell 50 Hardness).
- 3 to 1 Length to Width Ratio for Perfect Flight and Penetration.
- **WARRIOR** Available in 125 Grain with 1-Piece Machined Ferrule.
- **CHIEF** Available in 125 & 140 Grain.